cass allen

PLANT NOISE ASSESSMENT

DUKE PUB, ROGER STREET,
LONDON, WC1N 2PB

PUNCH PARTNERSHIPS (PTL) LTD

RP01-15262

PLANT NOISE ASSESSMENT

PROJECT: DUKE PUB, ROGER STREET, LONDON, WC1N 2PB

CLIENT: PUNCH PARTNERSHIPS (PTL) LTD

CLIENT ADDRESS:
JUBILEE HOUSE
SECOND AVENUE
BURTON UPON TRENT
DE14 2WF

COMPANY ADDRESS:
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DOCUMENT CONTROL:

REVISION	ISSUE DATE	REPORT BY	CHECKED BY	NOTES
0	25 September 2015	Adam Bamford, BSc MIOA DipIOA, Senior Acoustics Consultant	Patrick Allen, BSc CEng FIOA MEWI, Director	Initial issue

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1. INTRODUCTION

1.1 Cass Allen Associates has been appointed by Punch Partnerships (PTL) Ltd to provide an acoustic assessment to assist with a planning application for two new condensing units to be installed at ground floor level within the rear yard of the Duke Pub, Roger Street, London, WC1N 2PB.

1.2 The new condensers will be used primarily to heat the Public House. It is understand that they could run at any time throughout the daytime (defined as 0700 to 2300 hours) or night-time (defined as 2300 to 0700 hours) periods.

1.3 An environmental noise survey has been carried out to establish existing background and ambient noise levels outside the nearest residential premises during the hours that the new condensing units will operate. This data has then been used to establish suitable noise limits for the new condensing units in accordance with the Local Planning Authorities' (LPA) requirements, in order to protect existing residential amenity.

1.4 There is already existing operational mechanical plant (a cellar cooler and condenser) serving the Public House which is also located with the rear yard near to where the new condensing units are proposed. Subsequently, noise from the existing mechanical plant forms part of the ambient noise environment affecting the nearest residential dwellings and should be included in any assessment of new mechanical plant.

1.5 This report summarises:

- the methodology and results of the noise survey;
- the noise emission limits for the new condensing units to comply with the requirements of the LPA;
- the assessment of the noise emissions from the new condensing units at 1m external to the nearest sensitive façade.

1.6 This report contains technical terminology; a glossary of terms can be found at www.cassallen.co.uk/glossary.

2. PROJECT DESCRIPTION

2.1 The proposal is for the installation of two new condensing units at ground floor level within the rear yard of the existing premises. A drawing showing the existing and proposed layout and elevations is shown in Appendix 1.

2.2 The site is located in a mixed-use area, bounded to the north and west by Rodger Street and Mytre Court respectively. It is structurally linked to the east by 21 Roger Street which is a seven storey building comprising commercial and residential use (and is the nearest noise sensitive receptor to the new condensing units) and to the south by 1-4 Mytre Court which is a four storey block of residential apartments/flats.

2.3 An annotated site location plan is shown in Figure 1 and detailed annotated plan of the rear yard is shown in Figure 2. Photographs showing the existing mechanical plant within the rear yard of the premises, the noise logging position and the window of the nearest sensitive façade and the mechanical plant serving nearby development are included in Figures 3, 4 and 5 respectively.

Figure 1 Annotated Site Location Plan

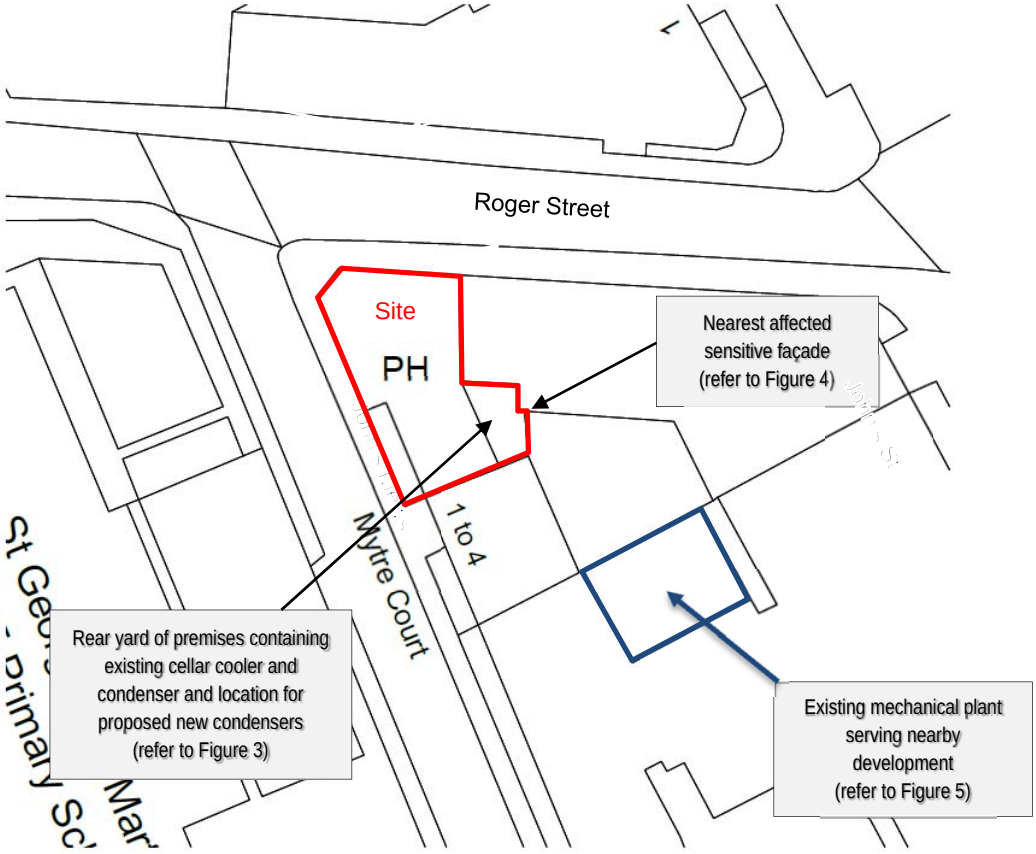


Figure 2 Rear Yard of Premises Showing Locations of Existing and Proposed Plant

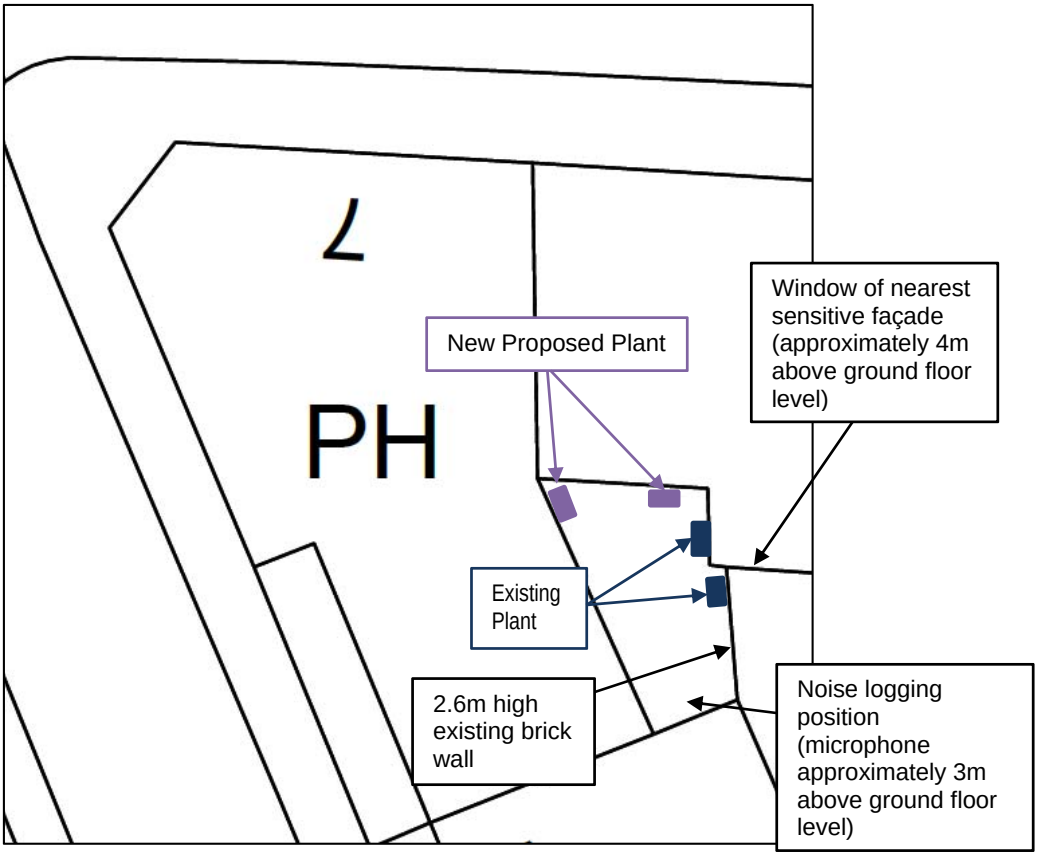


Figure 3 Existing Mechanical Plant within the Rear Yard of Premises

Figure 4 Nearest Affected Residential Dwelling and Noise Logging Position

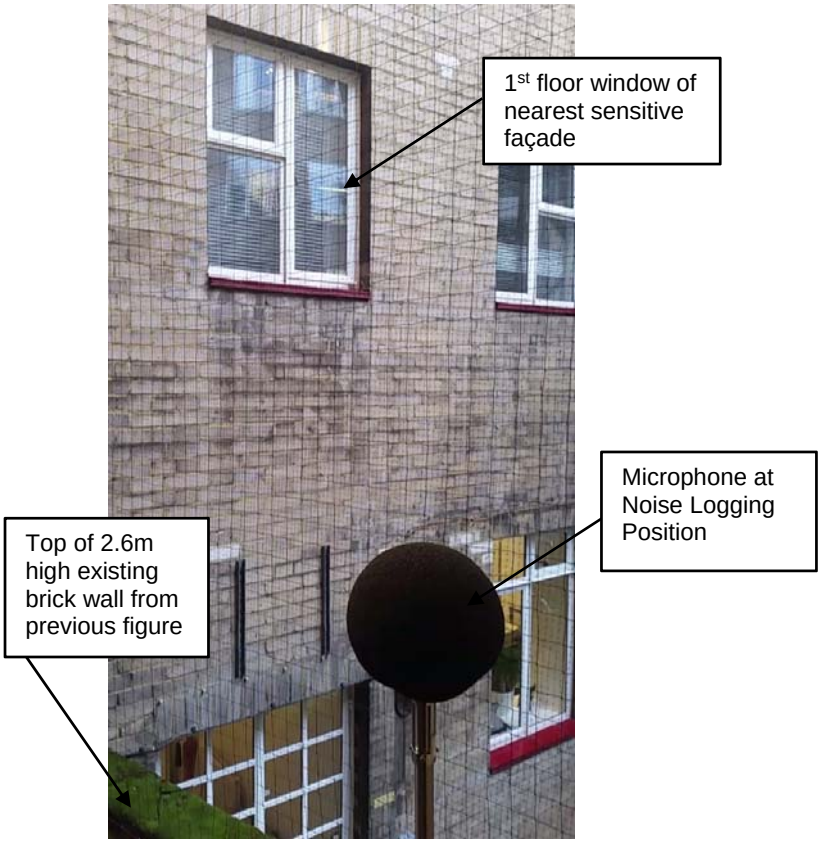


Figure 5 Mechanical Plant Serving Nearby Development (as viewed from the roof of the premises)

3. PLANT NOISE IMPACT ASSESSMENT

Design criteria – Mechanical plant noise

3.1 Table E of Camden Development Policy DP28 – Noise and Vibration (2010) set outs the LPAs requirements for noise emissions from new plant relative to existing background noise levels. This is reproduced in Figure 6 below. Despite the title of Table E, we understand that if the requirements of Table E are complied with, planning permission will be granted.

Figure 6 Table E of Camden Development Policy DP28

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 1 metre 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 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dB$_{LAeq}$

3.2 The above criteria are based on guidance given in BS4142:1997 '*Method for rating industrial noise affecting mixed residential and industrial areas'*.

3.3 The BS4142:1997 assessment methodology can be summarised as follows:

1. Measure the existing background noise levels (LA90,T dB) at the locations of nearby noise sensitive receptors during the quietest periods when the new noise source(s) will operate;
2. Predict the noise emissions (LAeq,T dB) from the new development at the locations of the nearby sensitive receptors including corrections for any distinguishable features (e.g. tones, whines, screeches, hisses etc);
3. Compare the measured background noise levels (item 1 above) with the measured or predicted rating noise levels (item 2 above) at each sensitive receptor. BS4142:1997 states that:
    - a rating noise level around 10 dB (or more) higher than the background noise level indicates that complaints are likely;
    - a rating noise level around 5 dB higher that the background noise level is "of marginal significance"; or,
    - if the rating noise level is more than 10 dB below the background noise level then it is a positive indication that complaints are unlikely.

3.4 It is worth noting that BS4142:1997 has now been withdrawn, having being superseded by BS4142:2014, which came into effect on 31st October 2014. An Environmental Health Officer at the LPA confirmed that the LPA will consider assessments based on the current standard accordingly. Subsequently, reference has been made to the new standard where applicable.

Site Noise Survey

3.5 A noise survey was undertaken at the site between the 17th and 18th September 2015. The full survey methodology, measurement results and graphical analysis is included in Appendix 2.

3.6 Ambient and measured background noise levels were dictated by the existing external mechanical plant serving the pub as well as existing mechanical pant serving nearby development (as shown in Figure 3). As described in paragraph 1.4 above, the noise from the existing mechanical plant dictates the noise environment affecting the nearest noise sensitive façade. Subsequently, these noise sources have been included as part of this assessment.

3.7 The typical background noise levels that were measured at position L1 which is deemed to be representative of the noise levels at the nearest existing premises were as follows:

- 63 dB LA90, 1 hour during the daytime period; and
- 62 dB LA90, 15min during the night-time period; and

3.8 These measured background noise levels above have been used to develop limits for the new condensing units at the nearest sensitive façade in accordance with the BS4142 assessment methodology and the policy DP28 requirements. The daytime and nigh-time limits are shown in Table 1 below.

Table 1 Plant Noise Limits for New Condensers to Comply with Table E of Policy DP28

Noise description and location of measurement	Period	
	Daytime (dB LAeq, 1hour)	Night-time (dB LAeq,15min)
Noise level at 1m external to nearest sensitive façade	58	57
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1m external to nearest sensitive façade	53	52
Noise that has distict impulses (bangs, clicks, clatters, thumps) at 1m external to nearest sensitive façade	53	52

Proposed mechanical plant design

3.9 The new condensing units comprise two Daikin RX60GV units which will be mounted externally to the facades of the existing premises. These will need to be mounted on suitable manufacturer approved anti-vibration mounts to minimise the transmission of structure-borne noise. Flexible connectors and pipework will also be required to ensure that there are no rigid connections between the condensers and the building structure.

3.10 The sound power level of each condenser unit is 63 dBA. This is based on published manufacturers' data which is included as Appendix 3.

3.11 BS4142 requires consideration of whether penalties ought to be applied to the new plant noise emissions to account for any acoustic features of the specific plant noise (e.g. tonality, impulsivity, intermittency and distinctiveness against the residual acoustic environment).

3.12 We are advised that the new condensers will operate continuously. In addition, the chosen units both feature an inverter, resulting in a gradual increase and decrease in fan speed (and hence noise) as the unit is ramped on and off. In light of these points, rating penalties have not been applied within this assessment.

3.13 Calculations were carried out using Cadna/A environmental noise modelling software to calculate the plant noise emissions from the new condensers at 1m from the nearest sensitive façade based on the current design. A modelling printout of the results is shown in Figure 7 and summarised in Table 2 below.

Figure 7 Calculated Noise Emissions from New Condensing Units – Current Design

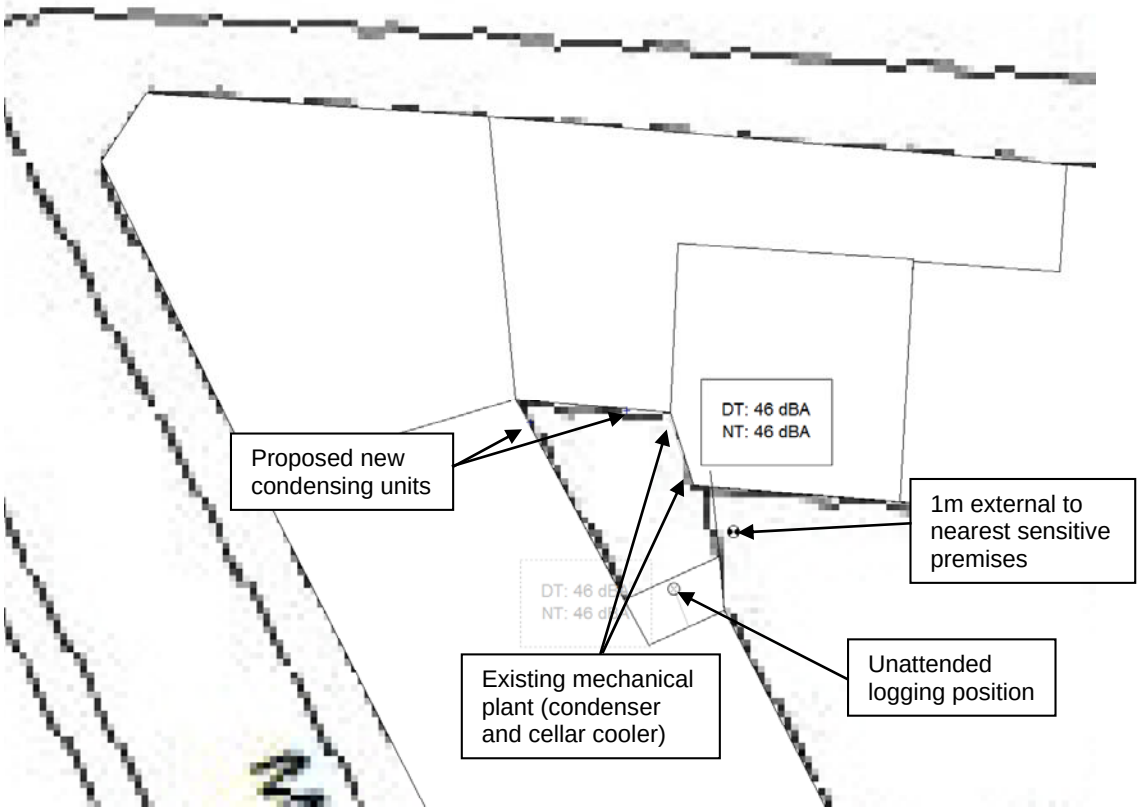


Table 2 Calculated Plant Noise Emissions from New Kitchen Extract Discharge (Free-field Levels) Based on Current Design

Receptor Location	Policy DP28 Noise Limit (dB, LAeq,T)		Calculated Plant Noise Emissions (dB, LAeq,T)		Compliant (Yes/No)	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
1m external to nearest sensitive façade	58	57	46	46	Yes	Yes

3.14 It can be seen from Table 2 above that the calculated plant noise emissions from the new condenser units are compliant with the requirements of Policy DP28 at 1m external to the nearest sensitive façade during both the daytime and night-time periods. Subsequently, it is considered to be acceptable with regards to noise. Furthermore, it is worth noting that the new condenser units would also be compliant even if penalties were applied to account for any acoustic features.

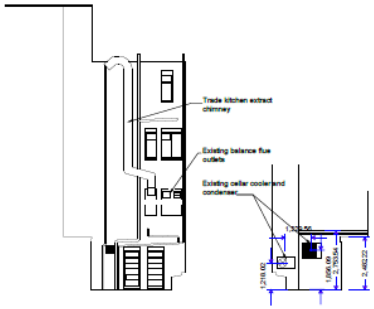
4. CONCLUSIONS

4.1 An assessment of the proposed new condensing units has been carried out in accordance with the Local Planning Authority policy requirements and BS4142.

4.2 The plant noise emissions from the new condensing units are calculated to achieve the Local Planning Authorities' policy requirements at 1m to the nearest sensitive façade without having to incorporate any specific noise mitigation measures.

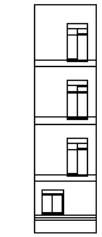
4.3 Therefore, in our view, there is no noise related reason why planning permission should not be granted.

Appendix 1 Current Development Drawings

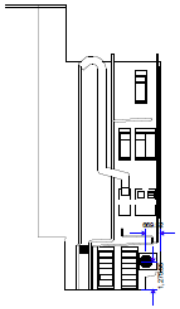


Elevation A (existing)
scale 1:100 @ A1

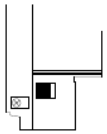
Elevation B (existing)
scale 1:100 @ A1



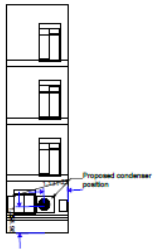
Elevation C (existing)
scale 1:100 @ A1



Elevation D (proposed)
scale 1:100 @ A1



Elevation E (proposed)
scale 1:100 @ A1

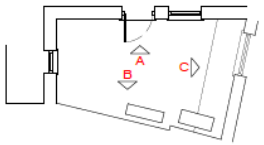


Elevation F (proposed)
scale 1:100 @ A1

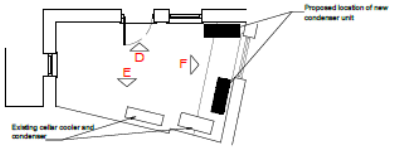
Block Plan (existing)
scale 1:500 @ A1

Location Plan
scale 1:1250 @ A1

Block Plan (proposed)
scale 1:500 @ A1



Rear Yard Layout (existing)
scale 1:50 @ A1



Rear Yard Layout (proposed)
scale 1:50 @ A1

Appendix 2 Survey Results

Survey Summary:

The survey comprised short-term operator attended noise measurements and longer-term unattended noise monitoring at the site. Noise levels at the site were generally dictated by existing mechanical fixed plant serving the premises.

Survey Period:

17/09/2015 to 18/09/2015

Survey Objectives:

- To identify noise sources that contribute to ambient and background noise levels at the site;
- To measure background noise level around the site over a typical daytime and night-time period.

Equipment Used:

Type	Manufacturer	Model	Serial Number
Sound level meter[1]	Bruel & Kjaer	2250	3007539
Calibrator	Bruel & Kjaer	4231	2115551
Sound level meter[1] (noise logger)	Rion	NL-32	00103137

Note 1: All sound level meters were calibrated before and after measurement periods and no significant drift in calibration was found to have occurred. The results of the measurements are therefore considered to be representative.

Weather Conditions:

The observed weather conditions were acceptable for acoustic measurement throughout the attended survey periods (low-medium wind speeds and no rain). Weather records for the area confirmed that weather conditions were also generally acceptable for acoustic measurement during the unattended monitoring.

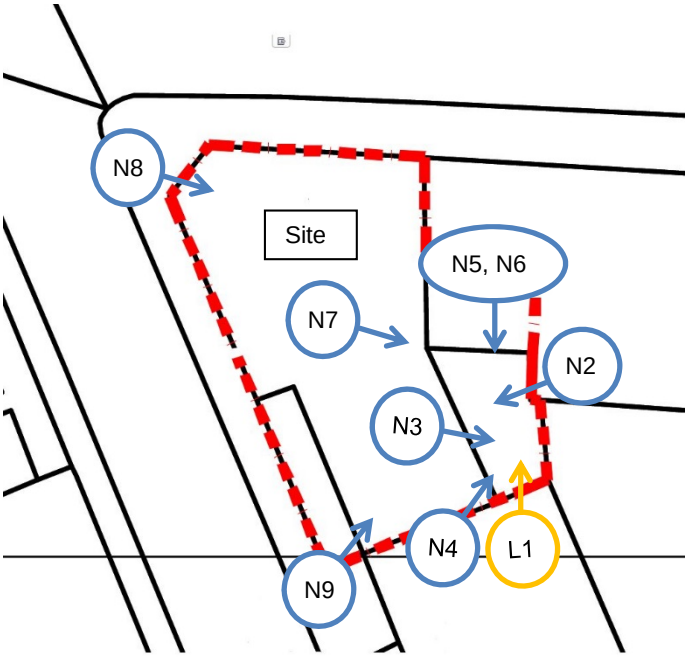
Measurement Positions:

Position (refer plan below)	Description
N1	Attended noise monitoring position. 4m above ground. Free-field. Direct line of sight to nearby existing plant
N2	Attended noise monitoring position. 1.5m above ground. Free-field. Noise source measurement of chiller unit (not far from condensing unit)
N3	Attended noise monitoring position. 1.5m above ground. Free-field. Noise source measurement of condensing unit (not far from chiller unit)
N4	Attended noise monitoring position. 2.5m above ground. Free-field. Direct line of sight to nearby existing plant
N5, N6	Attended noise monitoring position from stairs windows. 6.5m and 7.5m respectively above ground. Free-field. Direct line of sight to nearby existing plant
N7	Attended noise monitoring position on the roof. 10m above ground. Free-field. Direct line of sight to nearby existing yard
N8	Attended noise monitoring position on the roof. 10m above ground. Free-field. Opposite side of the yard (front side of the building)

Measurement Positions:

Position (refer plan below)	Description
N9	Attended noise monitoring position on the roof. 10m above ground. Free-field. Opposite side of the yard (front side of the building)
L1	Unattended noise logging position. 3m above ground level. Free-field. Direct line of sight to nearby existing plant and nearest sensitive façade

Site Plan showing Measurement Positions:



Attended Noise Monitoring Results:

Date	Position	Time	Meas. Length	LAeq, dB	LA90, dB	Observations
17/09/15	N1	11:00	1 min	65	65	Noise dictated by chiller plant and condenser
17/09/15	N2	11:05	1 min	67	67	Noise dictated by chiller plant and condenser
17/09/15	N3	11:10	1 min	63	62	Noise dictated by chiller plant and condenser
17/09/15	N4	11:15	1 min	59	58	Noise dictated by chiller plant and condenser
17/09/15	N5	11:20	1 min	61	60	Noise dictated by chiller plant and condenser
17/09/15	N6	11:25	1 min	61	60	Noise dictated by chiller plant and condenser
17/09/15	N7	11:30	1 min	57	56	Noise dictated by chiller plant and condenser
17/09/15	N8	11:35	1 min	51	50	Noise dictated by chiller plant and condenser
17/09/15	N9	11:40	1 min	65	65	Noise dictated by chiller plant and condenser

Unattended Noise

Monitoring Summary:

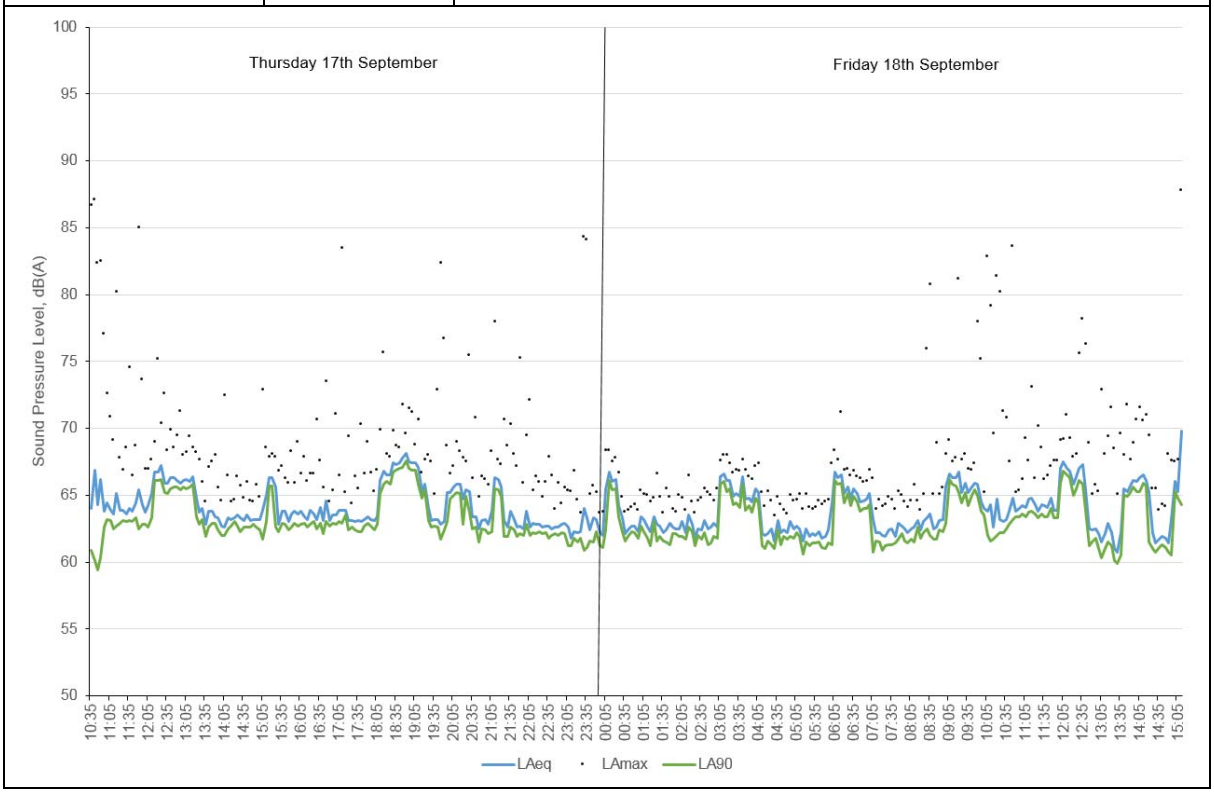
Meas. Period	Position	Daytime (0700-2300hrs)		Night-time (2300-0700hrs)	
		LAeq,16hr, dB	LA90,1hr dB[1]	LAeq,8hr, dB	LA90,5mins, dB[1]
17/09/15 to 18/09/15	L1	64	63	64	62

Note 1: Most typically occuring (i.e. modal value) measured during the period shown.

Unattended Noise

Monitoring Graphs:

Meas. Period	Position	
12.01.14 to 14.01.14	L1	



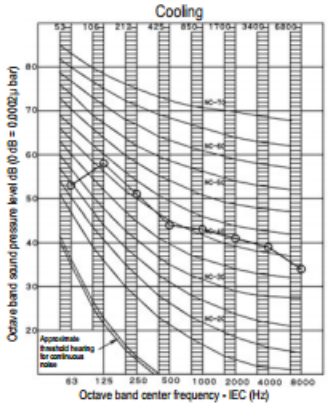
Appendix 3 Manufacturers Technical Data for New Condensing Units

9 Sound data

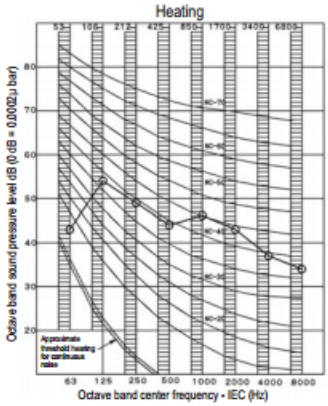
9 - 1 Sound Pressure Spectrum

RX50G

Cooling



Heating



NOTES

Scale	50Hz 220~240V
A	47

1 Over All (dB):
(B,G,N is already rectified)
2 Measuring place: measured in an echoic room.
3 Operation noise differs with operation and ambient conditions.
4 Location of microphone.
JIS C 9612
The operation noise measuring method is in accordance with JIS C 9612

NOTES

Scale	50Hz 220~240V
A	48

1 Over All (dB):
(B,G,N is already rectified)
2 Operation noise differs with operation and ambient conditions.

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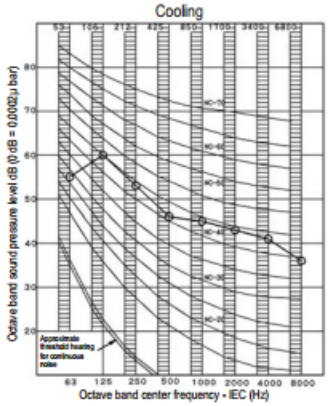
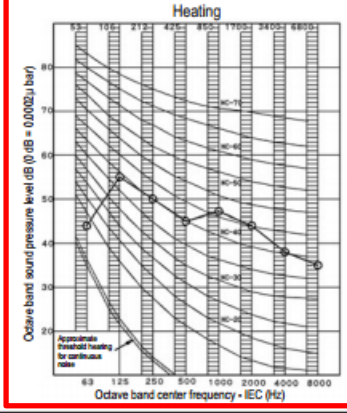
RX60G

Cooling



Heating



NOTES

Scale	50Hz 220~240V
A	49

1 Over All (dB):
(B,G,N is already rectified)
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