

The Met Building Percy Street London

Plant Noise Assessment

On behalf of

Edge MBS

Project Reference: 89944 | Revision: 00 | Date: 14th May 2021 Revised: 30th June 2021















01252 519881 W: noisesolutions.co.uk hello@noisesolutions.co.uk

T:

E:

Noise Solutions Ltd, Unit 5, Oriel Court, Omega Park, Alton, GU34 2YT Reg no. 3483481



Document Information

| Project Name | : | The Met Building Percy Street |
|-------------------|---|-------------------------------|
| Project Reference | : | 89944 |
| Report Title | : | Plant Noise Assessment |
| Doc Reference | : | 89944/PNA |
| Date | : | 14 th May 2021 |

| | Name | Qualifications | Initials | Date | |
|---|-----------|-----------------|---------------------------|---------------------------|--|
| Prepared by: | Jon Stump | BSc(Hons), MIOA | JS | 14 th May 2021 | |
| Reviewed and approved by:Nigel ChandlerBSc(Hons) MIOA | | NAC | 17 th May 2021 | | |
| For and on behalf of Noise Solutions Ltd | | | | | |

| Revision | Date | Description | Prepared | Reviewed/ Approved |
|----------|-------------|--------------------------------------|----------|-----------------------|
| 01 | 30 Jun 2021 | Assessment of new and retained plant | NAC | DMB |
| | | | | |

Noise Solutions Ltd (NSL) disclaims any responsibility to the Client and others in respect of any matters outside the scope of this report. This report has been prepared with reasonable skill, care and diligence within the terms of the Contract with the Client and generally in accordance with the appropriate ACE Agreement and taking account of the manpower, resources, investigations and testing devoted to it by agreement with the Client. This report is confidential to the Client and NSL (Noise Solutions Ltd) accepts no responsibility of whatsoever nature to third parties to whom this report or any part thereof is made known. Any such party relies upon the report at their own risk.

© Noise Solutions Ltd (NSL) 2021

Reg no. 3483481 Trading office Unit 5, Oriel Court, Omega Park, Alton, Hampshire, GU34 2YT



Contents

| Introduction | 1 |
|---|---|
| Details of development proposals | 1 |
| Nearest noise sensitive receptors | 2 |
| Existing noise climate | 2 |
| Covid-19 | 4 |
| Plant noise design criteria | 4 |
| London Borough of Camden | 4 |
| BS 4142:2014 Methods for rating and assessing industrial and commercial sound | 6 |
| Notes on BS 4142:2014 and Camden Local Plan Appendix 3 | 7 |
| Summary of requirements | 7 |
| Existing plant noise impact assessment | 8 |
| Uncertainties | 9 |
| Summary | 10 |
| | Introduction Details of development proposals Nearest noise sensitive receptors Existing noise climate Covid-19 Plant noise design criteria London Borough of Camden BS 4142:2014 Methods for rating and assessing industrial and commercial sound Notes on BS 4142:2014 and Camden Local Plan Appendix 3 Summary of requirements Existing plant noise impact assessment Uncertainties |

Appendices

| Appendix A | Acoustic terminology |
|------------|--|
| Appendix B | Photograph of site showing areas of interest |
| Appendix C | Manufacturer noise data |
| Appendix D | Environmental sound survey |
| Appendix E | Noise level calculations |



1.0 Introduction

- 1.1. Noise Solutions Ltd (NSL) has been commissioned by Edge MBS to undertake an assessment of existing plant noise levels at the Met Building, Percy Street, London prior to refurbishment works.
- 1.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.
- 1.3. The existing plant installation has been partially decommissioned, therefore accurate measurements of noise levels from the installation are not possible. As such, existing cumulative plant noise emission levels for the existing plant have been calculated at the most affected noise sensitive receptor using manufacturer's data. The cumulative noise levels have been assessed using the typical requirements of London Borough of Camden.
- 1.4. Predicted noise levels from the new and retained plant have also been compared with noise levels from the existing plant.
- 1.5. A glossary of acoustic terminology is given in **Appendix A**. An in-depth glossary of acoustic terms can be viewed online at www.acoustic-glossary.co.uk.

2.0 Details of development proposals

- 2.1. The Met Building comprises a podium level (ground to third floor) and a tower block (fourth to twelfth floor). The podium includes some retail units on the Tottenham Court Road side of the building, with office space occupying the remainder. The tower block comprises office space on all floors.
- 2.2. As part of the refurbishment of the building, new air conditioning and ventilation plant is proposed. The existing installation comprises external VRV units serving perimeter wall-mounted fan coil units, with additional ceiling-mounted fan coil units within the central area of the podium levels.
- 2.3. External VRV units are located at roof level, predominantly on the twelfth-floor roof. Twelve existing units will be retained, with the rest being replaced by sixteen new units.
- 2.4. On the third-floor roof on the Percy Street side, there are two heat recovery units (HRVUs) along with an air handling unit and other plant.



- 2.5. There are five HRVUs and a smaller number of split AC units on the third-floor roof on the Tottenham Court Road side of the building. The existing condensers serving the NatWest and HSBC branches are to be retained.
- 2.6. Twelve of the existing condensers on the third floor podium roof will be retained.
- 2.7. **Appendix C** contains tables with the manufacturer's published sound pressure levels for the existing plant and new plant.

3.0 Nearest noise sensitive receptors

- 3.1. The area surrounding the site predominantly comprises commercial and retail premises, although there are residential properties along Percy Street to the west of the building. There are also some residential flats above the retail units on the far side of Percy Street to the south.
- 3.2. The nearest noise-sensitive receptors (Receptor R1) to the plant areas are immediately adjacent to the building to the west, on Percy Street.
- 3.3. The properties on the south side of Percy Street are around 25m from the nearest plant area.
- 3.4. The locations of the plant and receptors are shown in Appendix B.

4.0 Existing noise climate

- 4.1. An environmental noise survey was undertaken to establish the typical background sound levels at a location representative of the noise climate outside the façades of the nearest noise sensitive receptors to the proposed plant area during the quietest times at which the plant will operate.
- 4.2. The results of the environmental sound survey are summarised in Table 1 below. The full set of measurement results and details of the survey methodology are presented in Appendix D.

| Measurement period | Range of recorded sound pressure levels (dB) | | | | |
|-------------------------------|--|---------------------------|--------------|--------------|--|
| riedsurement period | L _{Aeq(15mins)} | L _{Amax(15mins)} | LA10(15mins) | LA90(15mins) | |
| Daytime (07.00 – 23.00 hours) | 47-61 | 51-76 | 49-64 | 45-53 | |
| Night (23.00 – 07.00 hours) | 46-55 | 50-76 | 47-60 | 44-50 | |

| Table | <i>1</i> | Summary | of survey | results |
|-------|----------|---------|-----------|---------|
| | | | | |







4.3. Further statistical analysis has been carried out on the data, and the mean and median values are shown in Table 2 below.

Table 2 Statistical analysis of L_{A90,15min} levels during the daytime period

| dB, L _{A90} daytime period | | | | |
|-------------------------------------|----|--|--|--|
| Mean | 49 | | | |
| Mode | 50 | | | |
| Median | 49 | | | |

4.4. From the histogram analysis, 45dB has been selected to be a robust representation of the background noise level during the daytime period.

Figure 2 Histogram of night-time L_{A90} background sound pressure levels





4.5. Further statistical analysis has been carried out on the data and the mean and median values are shown in table 3 below.

| dB, LA90 night-time period | | | | |
|----------------------------|----|--|--|--|
| Mean | 48 | | | |
| Mode | 50 | | | |
| Median | 48 | | | |

Table 3 Statistical analysis of LA90,15min levels during the night-time period

- 4.6. Again, from the histogram analysis, 44dB has been chosen to be representative of the background sound level during the night-time period.
- 4.7. The following values are considered representative of the existing background sound pressure levels at nearby noise sensitive premises:
 - 45dB L_{A90} during the daytime period; and
 - 44dB L_{A90} during the night-time period.

Covid-19

4.8. It should be noted that the environmental noise survey discussed in this report was undertaken in April 2021, at a time when the coronavirus pandemic was causing a disruption to typical working patterns and other activity. It is therefore likely that recorded sound levels are slightly lower than would otherwise be expected where dominated by road or air traffic. While the data should therefore be treated with an element of caution, where it has been used to establish background sound levels it is likely to understate the more-usual background sound levels and therefore result in a robust assessment.

5.0 Plant noise design criteria

London Borough of Camden

- 5.1. Section 6 of the Camden Planning Guidance Amenity, published March 2018, gives guidance on noise and vibration.
- 5.2. Clause 6.8 refers to noise thresholds within Appendix 3 of the Local Plan and to the principles of No observed effect level (NOEL), Lowest observable adverse effect level (LOAEL) and Significant observed adverse effect level (SOAEL) and defines their meanings. Specifically, in the context of this report, LOAEL is defined as:

The level above which changes in behaviour (e.g. closing windows for periods of the day) and adverse effects on health (e.g. sleep disturbance) and quality of life can be detected.



5.3. SOEAL is defined as:

The level above which adverse effects on health and quality of life occur. This could include psychological stress, regular sleep deprivation and loss of appetite.

5.4. Clause 6.27 states that:

Developments proposing plant, ventilation, air extraction or conditioning equipment and flues will need to provide the system's technical specifications to the council accompanying any acoustic report. "BS4142 Method for rating Industrial and Commercial Sound' contains guidance and standards which should also be considered within the acoustic report.

5.5. Appendix 3 within the Camden Local Plan published 2017 states:

"A relevant standard or guidance document should be referenced when determining values for LOAEL and SOAEL for non-anonymous noise. Where appropriate and within the scope of the document it is expected that British Standard 4142:2014 'Methods for rating and assessing industrial and commercial sound' (BS 4142) will be used. For such cases a 'Rating Level' of 10 dB below background (15dB if tonal components are present) should be considered as the design criterion)."

5.6. Table C of the appendix states the criteria at which development related noise levels will be acceptable:

| Existing Noise sensitive receptor | Assessment Location | Design Period | LOAEL (green) | LOAEL to SOAEL (Amber) | SOAL (Red) |
|--|---|------------------|--|--|--|
| Dwellings** | Garden used for main amenity (free field) and Outside living or dining or bedroom window (façade) | Day | 'Rating level' 10dB* below background | 'Rating level' between 9dB below and 5dB above background | 'Rating level' greater than 5dB above background |
| Dwellings** | Outside bedroom window (façade) | Night | 'Rating level' 10dB* below background and no events exceeding 57dBL _{Amax} | 'Rating level' between 9dB below and 5dB above background or noise events between 57dB and 88dBL _{Amax} | 'Rating level' greater than 5dB above background and/or events exceeding 88dBL _{Amax} |

Table C: Noise levels applicable to proposed industrial and commercial development (including plant and machinery)



*10dB should be increased to 15dB if the noise contains audible tonal elements. (day and night). However, if it can be demonstrated that there is no significant difference in the character of the residual background noise and the specific noise from the proposed development then this reduction may not be required. In addition, a frequency analysis (to include, the use of Noise Rating (NR) curves or other criteria curves) for the assessment of tonal or low frequency noise may be required.

**levels given are for dwellings, however, levels are use specific and different levels will apply dependent on the use of the premises.

BS 4142:2014 Methods for rating and assessing industrial and commercial sound

- 5.7. BS 4142:2014 is intended to be used to assess the likely effects of sound on people residing in nearby dwellings. The scope of BS 4142:2014 includes "sound from fixed plant installations which comprise mechanical and electrical plant and equipment".
- 5.8. The procedure contained in BS 4142:2014 is to quantify the "specific sound level", which is the measured or predicted level of sound from the source in question over a one hour period for the daytime and a 15 minute period for the night-time. Daytime is defined in the standard as 07.00 to 23.00 hours, and night-time as 23.00 to 07.00 hours.
- 5.9. The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for either potentially tonal or impulsive elements. The standard sets out objective methods for determining the presence of tones or impulsive elements, but notes that it is acceptable to subjectively determine these effects.
- 5.10. The penalty for tonal elements is between 0dB and 6dB, and the standard notes: "Subjectively, this can be converted to a penalty of 2 dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6 dB where it is highly perceptible."
- 5.11. The penalty for impulsive elements is between 0dB and 9dB, and the standard notes: "Subjectively, this can be converted to a penalty of 3 dB for impulsivity which is just perceptible at the noise receptor, 6 dB where it is clearly perceptible, and 9 dB where it is highly perceptible."
- 5.12. The assessment outcome results from a comparison of the rating level with the background sound level. The standard states:
 - *Typically, the greater this difference, the greater the magnitude of the impact.*
 - A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;



- A difference of around +5 dB is likely to be 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 sound level, this is an indication of the specific sound source having a low impact, depending on the context.
- 5.13. The standard does state that "adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."
- 5.14. The standard goes on to note that: "Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night."
- 5.15. In addition to the margin by which the Rating Level of the specific sound source exceeds the Background Sound Level, the 2014 edition places emphasis upon an appreciation of the context, as follows:

"An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessments and arriving at decisions, therefore, it is essential to place the sound in context."

5.16. BS 4142:2014 requires uncertainties in the assessment to be considered, and where the uncertainty is likely to affect the outcome of the assessment, steps should be taken to reduce the uncertainty.

Notes on BS 4142:2014 and Camden Local Plan Appendix 3

5.17. It should be noted that a plant rating noise level equal to the background sound level would be considered to have a "low impact, depending on the context" using BS 4142, and would fall into the "Amber" category with the Camden Local Plan.

Summary of requirements

5.18. The local authority's usual requirement is that the plant noise level at the nearest noise-sensitive windows should be at least at least 10dB below the representative L_{A90} background sound level.



5.19. A summary of the recommended plant noise limits is given in Table 4.

| Period | Cumulative plant noise level, dB(A) |
|----------------------------------|--|
| Daytime (07.00 – 23.00 hours) | 35 |
| Night-time (23.00 – 07.00 hours) | 34 |

Table 4 Proposed plant noise level at noise sensitive residential receptors

5.20. These limits will result in a plant noise rating level at or below that at which a "low impact" would be expected, according to the method described in BS 4142:2014.

6.0 Existing plant noise impact assessment

- 6.1. The cumulative plant sound pressure level at the most affected noise sensitive receptors has been predicted based on manufacturer's data for the existing equipment.
- 6.2. For both receptors, a nominal 15dB screening loss has been applied to plant located on the 12th floor tower roof. While actual screening losses applicable to some of the individual plant items are likely to be significantly greater than this, it is noted that cumulative plant noise levels at both receptors are dominated by plant at third floor roof level (the Percy Street location in particular). More accurate screening losses (resulting in lower calculated noise levels from the 12th floor tower roof) would not affect the cumulative noise levels used in this assessment.
- 6.3. As there is a partial-storey-height gap between the third-floor roof and the bottom of the Tower, the level of screening from the Tottenham Court Road plant area to Receptor R1 is limited. A nominal 5dB reduction has been included. It has been assumed that Receptor R2 has full line of sight to this plant area, however.
- 6.4. It should be noted that the plant is not anticipated to exhibit any tonal or impulsive characteristics provided it is well maintained. All proposed plant will be inverter driven and, therefore, will gently ramp up and down depending on the demands on the various systems. However, a penalty of 3dB as described in BS 4142:2014 has been applied for the possible presence of "... characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment...".
- 6.5. Table 6, below, summarises the assessment of cumulative sound pressure levels of the existing and proposed plant at the nearest noise-sensitive windows. All other nearby receptors benefit from increased distance/screening to the plant. The full set of calculations can be found in **Appendix E**.



Table 6 Assessment of noise levels at nearby receptor due to existing and proposed plant

| Receptor | Period | | Predicted plant noise rating level at receptor, LAeq (dB) | Criterion, dB(A) | Difference (dB) |
|----------|---|------------------------|---|---------------------|--------------------|
| | Davtime period | Existing plant | 51 | 35 | +16 |
| R1 | (07.00 – 23.00 hours) | New and retained plant | 51 | 35 | +16 |
| | | Change | 0 | | |
| | Night-time period (23.00 – 07.00 hours) | | - | 34 | |
| R2 | Davtime period | Existing plant | 42 | 35 | +7 |
| | (07.00 – 23.00 hours) | New and retained plant | 42 | 35 | +7 |
| | | Change | 0 | | |
| | Night-time period (23.00 – 07.00 hours) | | - | 34 | |

- 6.6. Given the age of the current installation and its partially decommissioned state, it is unknown what equipment if any operates on a 24-hour basis. It is likely that the majority of the equipment, serving office accommodation, will run only during daytime hours. There is, therefore, likely to be a reduction in noise level of greater than 1dB overnight compared to daytime running. Were compliance with the daytime criterion to be achieved, then the night-time criterion would be met by default.
- 6.7. The above assessment demonstrates that cumulative plant noise levels are currently significantly in excess of the typical Local Authority noise limits at the nearest residential properties.
- 6.8. There will be no increase in the cumulative plant sound pressure level due to the proposed new and retained plant at either receptor.

Uncertainties

- 6.9. Where possible, uncertainty in the above assessments has been minimised by taking the following steps:
 - The meter and calibrator used have a traceable laboratory calibration and the meter was field calibrated before and after the measurements.



- Uncertainty in the calculated impacts has been reduced by the use of a well-established calculation method.
- Care was taken to ensure that the measurement position was representative of the noise climate outside the nearby residential dwellings and not in a position where higher noise levels were present.
- 6.10. All reasonable steps have been taken to robustly assess noise from the existing plant.

7.0 Summary

- 7.1. Noise Solutions Ltd has been appointed by Edge MBS to undertake an assessment of existing plant noise levels at the Met Building, Percy Street, London prior to refurbishment works.
- 7.2. An environmental sound survey has been undertaken to establish the prevailing background sound pressure levels at a location representative of the sound levels outside the nearest noise sensitive receptors to the site.
- 7.3. Cumulative plant noise emission levels for the existing plant installation have been calculated at the most affected noise sensitive receptor and assessed using the typical requirements of the London Borough of Camden.
- 7.4. The assessment has demonstrated that the proposed criteria are currently being exceeded by the existing installation. However, refurbishment of the building and a new plant installation will not lead to increased plant noise levels at the nearest noise-sensitive receptors.



Appendix A Acoustic terminology

| Parameter | Description |
|------------------------|---|
| Ambient Noise Level | The totally encompassing sound in a given situation at a given time, usually composed of a sound from many sources both distant and near (L _{Aeq,T}). |
| Decibel (dB) | A scale for comparing the ratios of two quantities, including sound pressure and sound power. The difference in level between two sounds s1 and s2 is given by 20 log ₁₀ (s1/s2). The decibel can also be used to measure absolute quantities by specifying a reference value that fixes one point on the scale. For sound pressure, the reference value is 20 μ Pa. The threshold of normal hearing is in the region of 0 dB and 140 dB is the threshold of pain. A change of 1 dB is only perceptible under controlled conditions. |
| dB(A), L _{Ax} | Decibels measured on a sound level meter incorporating a frequency weighting (A weighting) which differentiates between sounds of different frequency (pitch) in a similar way to the human ear. Measurements in dB(A) broadly agree with people's assessment of loudness. A change of 3 dB(A) is the minimum perceptible under normal conditions, and a change of 10 dB(A) corresponds roughly to halving or doubling the loudness of a sound. The background noise in a living room may be about 30 dB(A); normal conversation about 60 dB(A) at 1 metre; heavy road traffic about 80 dB(A) at 10 metres; the level near a pneumatic drill about 100 dB(A). |
| Fast Time Weighting | Setting on sound level meter, denoted by a subscript F, that determines the speed at which the instrument responds to changes in the amplitude of any measured signal. The fast time weighting can lead to higher values than the slow time weighting when rapidly changing signals are measured. The average time constant for the fast response setting is 0.125 (1/8) seconds. |
| Free-field | Sound pressure level measured outside, far away from reflecting surfaces (except the ground), usually taken to mean at least 3.5 metres |
| Façade | Sound pressure level measured at a distance of 1 metre in front of a large sound reflecting object such as a building façade. |
| L _{Aeq,T} | A noise level index called the equivalent continuous noise level over the time period T. This is the level of a notional steady sound that would contain the same amount of sound energy as the actual, possibly fluctuating, sound that was recorded. |
| L _{max,T} | A noise level index defined as the maximum noise level recorded during a noise event with a period T. L _{max} is sometimes used for the assessment of occasional loud noises, which may have little effect on the overall L _{eq} noise level but will still affect the noise environment. Unless described otherwise, it is measured using the 'fast' sound level meter response. |
| L _{10,T} | A noise level index. The noise level exceeded for 10% of the time over the period T. L ₁₀ can be considered to be the "average maximum" noise level. Generally used to describe road traffic noise. L _{A10,18h} is the A –weighted arithmetic average of the 18 hourly L _{A10,1h} values from 06:00-24:00. |
| L _{90,T} | A noise level index. The noise level that is exceeded for 90% of the measurement time interval, T. It gives an indication of the lower levels of fluctuating noise. It is often used to describe the background noise level and can be considered to be the "average minimum" noise level and is a term used to describe the level to which non-specific noise falls during quiet spells, when there is lull in passing traffic for example. |



Appendix B Photograph of site showing areas of interest





Appendix C Manufacturer noise data

Existing plant

| Manufacturer | Make / model | No. off | Notes | dBA | Note |
|----------------------------|---------------------|------------|----------------------------------|-----|------|
| Third Floor West | | | · | | |
| Daikin | RXYQ16M8W1B | 3 | | 60 | 1 |
| Daikin | REYQ16M8W1B | 1 | 1 | 60 | 1 |
| Daikin | REYQ10M7W1B | 2 | L _p at 1m | 58 | 1 |
| Daikin | RZQSG71L3V1B | 1 | 1 | 50 | 1 |
| Daikin | RSEYP10K7W1 | 1 | 1 | 58 | 1 |
| Daikin | Split unit | 1 | Typical L _p at 1m* | 50 | 1 |
| Daikin | VAM2000FA7VE | 2 | | 50 | 1 |
| Daikin | RXS50L2V1B | 1 | | 48 | 1 |
| Daikin | RX50K2V1B | 1 | L _p at 1m | 48 | 1 |
| Daikin | RR71B7V3B | 2 | | 50 | 1 |
| Daikin | ALB07*B(S) | 1 | L _p at 1.5m | 41 | 1 |
| Moducel | Moducel condenser | 1 | Typical L _p at 1m* | 50 | 1 |
| Toshiba | RAV-SP564ATP-E | 1 | L _p at 1m | 47 | 1 |
| VES Andover | ECO541/W-E/DS/R/S | 1 | Typical L _p at 1m* | 50 | 1 |
| Tower Roof | · | - | · | | |
| Daikin | RSEYP10K | 12 | L _p at 1m | 58 | 1 |
| Daikin | RSEYP10K | 29 | L _p at 1m | 58 | 3 |
| Daikin | RSEYP8K | 6 | | 57 | 3 |
| Daikin | RSXYP10L | 1 | 1 | 58 | 3 |
| Daikin | RSXYP8L | 4 | 1 | 57 | 3 |
| Daikin | RXS71BVMB | 1 |] | 52 | 1 |
| Daikin | RZQ125B9WB | 1 | 1 | 53 | 3 |
| Daikin | FTKS50BV | 1 | | 44 | 3 |
| Daikin | RZQG100L8V1B | 1 | L _p at Im | 52 | 3 |
| Daikin | RXS71FAV18 | 1 | | 52 | 3 |
| Mitsubishi | PUHZ-ZRP100VKA | 1 |] | 51 | 3 |
| Mitsubishi | PUZ-M100YKA | 1 |] | 54 | 3 |
| Mitsubishi | PUHZ-RP60VHA4 | 1 | 1 | 48 | 3 |
| Mitsubishi | SRC71ZK-S | 1 | 1 | 53 | 3 |
| | Toilet extract fan | 1 | Typical L _p at 1m* | 40 | 1 |
| FG Wilson (Sound Power) | Emergency generator | 1 | L _w ** | 98 | 1 |
| Third Floor East | | 1 | 1 | ſ | |
| Mitsubishi | PUTY-RP200YJM-B | 2 | L _p at 1m | 56 | 1 |
| Mitsubishi | PUH-P2.5VGAA | 1 | L _p at 1m | 50 | 1 |
| Mitsubishi | MUZ-AP71VG | 1 | L _p at 1m | 55 | 1 |
| Mitsubishi | PUHZ-ZRP50VKA | 1 | L _p at 1m | 46 | 3 |
| Daikin | VAM2000FA7VE | 5 | L _p at 1m | 50 | 2 |



*Data unavailable, typical levels used

**Generator operates under emergency conditions only; excluded from assessment

Notes: 1 – *Existing plant to be retained;* 2 – *Existing plant to be replaced.* 3 – *Existing plant to be removed*

Proposed new plant

| Manufacturer | Make / model | No. off | dBA |
|--------------|--------------|---------|----------|
| Daikin | REYQ10U | 16 | 57 at 1m |
| Daikin | RZASG140MY1 | | 54 at 1m |
| Daikin | VAM1000J | 7 | 42 at 1m |



Appendix D Environmental sound survey

Details of environmental sound survey

- D.1 Measurements of the existing background sound levels were undertaken from 11.35 hours on Thursday 29th April to 16.00 hours on Friday 30th April 2021.
- D.2 The sound level meter was programmed to record the A-weighted L_{eq}, L₉₀, L₁₀ and L_{max} noise indices for consecutive five-minute sample periods for the duration of the survey.

Measurement position

D.3 The representative measurement position was located on a railing close to the boundary of the western plant area with the adjacent residential property on Percy Street (location indicated on the site plan in Appendix B). In accordance with BS 7445-2:21991 'Description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use', the measurements were undertaken under free-field conditions.

Equipment

D.4 Details of the equipment used during the survey are provided in the table below. The sound level meter was calibrated before and after the survey; no significant change (+/-0.2 dB) in the calibration level was noted.

| Description | Model / serial no. | Calibration date | Calibration certificate no. | |
|---------------------------|-----------------------|---------------------|-----------------------------|--|
| Class 1 Sound level meter | Rion NL-31 / 00593603 | | | |
| Condenser microphone | Rion UC-53A / 316131 | 05/11/2019 | TCRT18/1382 | |
| Preamplifier | Rion NH-21 / 30366 | | | |
| Calibrator | Rion NC-74 / 35094453 | 20/08/2020 | 14015672-2 | |

D.5 Weather conditions were determined both at the start and on completion of the survey. It is considered that the meteorological conditions were appropriate for environmental noise measurements. The table below presents the weather conditions recorded on site at the beginning and end of the survey.



| Weather Conditions | | | | | | | | | |
|-------------------------------|---------------------------------------|---|------------------------|------------------|--|--|--|--|--|
| Measurement Location | Time/Date | Description | Beginning of Survey | End of Survey | | | | | |
| As indicated on Appendix B | 11.35 29/4/21 – 16.00 30/4/21 | Temperature (°C) | 8 | 7 | | | | | |
| Cloud | Cover | Precipitation: | No | Light rain | | | | | |
| Symbol Scale in ol | xtas (eighths) mpletely clear | Cloud cover (oktas – see guide) | 7 | 7 | | | | | |
| | | Presence of fog/snow/ice | No | No | | | | | |
| 3 4 Sky hal | f cloudy | Presence of damp roads/wet ground | No | Damp | | | | | |
| 5 | | Wind Speed (m/s) | 1.0 | 2.4 | | | | | |
| 6 | | Wind Direction | Ν | SE | | | | | |
| 7 8 8 9 | npletely cloudy structed from view | Conditions that may cause temperature inversion (i.e. calm nights with no cloud) | No | No | | | | | |

Results

D.6 The results of the survey are considered to be representative of the background sound pressure levels at the façades of the most affected noise sensitive receptors to the plant area during the quietest times at which the plant will operate. The noise climate at the measurement position was dominated by existing plant and local road traffic. The results of the survey are presented in a time history graph overleaf.







Appendix E Noise level calculations

Summary

| | | R | 1 | | R2 | | | |
|--|-------------------|------------------|----------|---------------------------------|-------------------|------------------|----------|---------------------------------|
| Receptor | Existing plant | Retained only | New only | Combined New and retained | Existing plant | Retained only | New only | Combined New and retained |
| 3 rd floor plant west (Percy Street) | 47 | 47 | 39 | 48 | 38 | 37 | 28 | 38 |
| Tower plant | 27 | 21 | 22 | 24 | 26 | 19 | 22 | 24 |
| 3 rd floor plant east (TCR) | 23 | 28 | 27 | 31 | 29 | 30 | 32 | 34 |
| Total L _p | 48 | | | 48 | 39 | | | 39 |
| BS 4142 feature correction | 3 | | | 3 | 3 | | | 3 |
| Rating Level | 51 | | | 51 | 42 | | | 42 |

Calculated plant noise levels, dB(A), at receptors

See individual calculations below.



Third floor west (Percy Street) plant area – existing plant

| Receptor R1 | | | | | | | |
|-------------------|--------------|----|-------|---------------|------------------|----------------|----------|
| Туре | Manufacturer | Lp | at, m | Dist to R1 | Dist loss, dB | Screenin g | Lp at R1 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 11 | -20.7 | 0 | 39.3 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 12 | -21.2 | 0 | 38.8 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 10 | -20.2 | 0 | 39.8 |
| REYQ16M8W1B | Daikin | 60 | 1 | 10 | -20.3 | 0 | 39.7 |
| REYQ10M7W1B | Daikin | 58 | 1 | 11 | -20.8 | 0 | 37.2 |
| REYQ10M7W1B | Daikin | 58 | 1 | 19 | -25.8 | 0 | 32.2 |
| RZQSG71L3V1B | Daikin | 50 | 1 | 22 | -26.9 | 0 | 23.1 |
| RSEYP10K7W1 | Daikin | 58 | 1 | 14 | -22.9 | 0 | 35.1 |
| RR71B7V3B | Daikin | 50 | 1 | 15 | -23.6 | 0 | 26.4 |
| RR71B7V3B | Daikin | 50 | 1 | 15 | -23.7 | 0 | 26.3 |
| Split unit | Daikin | 50 | 1 | 15 | -23.5 | 0 | 26.5 |
| RXS50L2V1B | Mitsubishi | 50 | 1 | 16 | -24.0 | 0 | 24.0 |
| RX50K2V1B | Mitsubishi | 55 | 1 | 22 | -26.7 | 0 | 21.3 |
| RAV-SP564ATP-E | Toshiba | 47 | 1 | 22 | -26.9 | 0 | 20.1 |
| VAM2000FA7VE | Daikin | 50 | 1 | 6 | -15.2 | 0 | 34.8 |
| VAM2000FA7VE | Daikin | 50 | 1 | 17 | -24.6 | 0 | 25.4 |
| ALB07*B(S) | Daikin | 41 | 1.5 | 16 | -20.5 | 0 | 20.5 |
| ECO541/W-E/DS/R/S | VES Andover | 40 | 1 | 3 | -8.0 | 0 | 32.0 |
| Moducel condenser | Moducel | 50 | 1 | 15 | -23.6 | 0 | 26.4 |
| | | | | | | Total at R1 | 47.2 |
| Receptor R2 | 2 | | | | | | |
| Туре | Manufacturer | Lp | at, m | Dist to R2 | Dist loss, dB | Screenin g | Lp at R2 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 40 | -32.0 | 0 | 28.0 |

| .,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,, | - Idilatactal Cl | -P | | R2 | loss, dB | g | |
|---|------------------|----|-----|----|----------|----------------|------|
| RXYQ16M8W1B | Daikin | 60 | 1 | 40 | -32.0 | 0 | 28.0 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 39 | -31.9 | 0 | 28.1 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 34 | -30.5 | 0 | 29.5 |
| REYQ16M8W1B | Daikin | 60 | 1 | 34 | -30.7 | 0 | 29.3 |
| REYQ10M7W1B | Daikin | 58 | 1 | 36 | -31.2 | 0 | 26.8 |
| REYQ10M7W1B | Daikin | 58 | 1 | 35 | -30.9 | 0 | 27.1 |
| RZQSG71L3V1B | Daikin | 50 | 1 | 34 | -30.7 | 0 | 19.3 |
| RSEYP10K7W1 | Daikin | 58 | 1 | 38 | -31.5 | 0 | 26.5 |
| RR71B7V3B | Daikin | 50 | 1 | 30 | -29.6 | 0 | 20.4 |
| RR71B7V3B | Daikin | 50 | 1 | 32 | -30.1 | 0 | 19.9 |
| Split unit | Daikin | 50 | 1 | 35 | -30.9 | 0 | 19.1 |
| RXS50L2V1B | Mitsubishi | 50 | 1 | 34 | -30.7 | 0 | 17.3 |
| RX50K2V1B | Mitsubishi | 55 | 1 | 32 | -30.2 | 0 | 17.8 |
| RAV-SP564ATP-E | Toshiba | 47 | 1 | 34 | -30.7 | 0 | 16.3 |
| VAM2000FA7VE | Daikin | 50 | 1 | 36 | -31.0 | 0 | 19.0 |
| VAM2000FA7VE | Daikin | 50 | 1 | 29 | -29.3 | 0 | 20.7 |
| ALB07*B(S) | Daikin | 41 | 1.5 | 34 | -27.2 | 0 | 13.8 |
| ECO541/W-E/DS/R/S | VES Andover | 40 | 1 | 38 | -31.6 | 0 | 8.4 |
| Moducel condenser | Moducel | 50 | 1 | 31 | -29.8 | 0 | 20.2 |
| | | | | | | Total at R2 | 37.3 |



12th floor (Tower) plant area – existing plant

| πετεριοι κι | | | | Dict to | Dictloss | | |
|-------------|--------------|----|-------|---------|----------|-----------|----------|
| Туре | Manufacturer | Lp | at, m | R1 | dB | Screening | Lp at R1 |
| RSEYP10K | Daikin | 58 | 1 | 39 | -31.7 | -15 | 11.3 |
| RSEYP10K | Daikin | 58 | 1 | 39 | -31.8 | -15 | 11.2 |
| RSEYP8K | Daikin | 57 | 1 | 39 | -31.9 | -15 | 10.1 |
| RSXYP10L | Daikin | 58 | 1 | 41 | -32.2 | -15 | 10.8 |
| RSEYP8K | Daikin | 57 | 1 | 42 | -32.5 | -15 | 9.5 |
| RSEYP10K | Daikin | 58 | 1 | 41 | -32.2 | -15 | 10.8 |
| RSEYP10K | Daikin | 58 | 1 | 41 | -32.2 | -15 | 10.8 |
| RSEYP10K | Daikin | 58 | 1 | 41 | -32.3 | -15 | 10.7 |
| RSEYP8K | Daikin | 57 | 1 | 41 | -32.3 | -15 | 9.7 |
| RSXYP8L | Daikin | 57 | 1 | 42 | -32.4 | -15 | 9.6 |
| RSEYP10K | Daikin | 58 | 1 | 41 | -32.4 | -15 | 10.6 |
| RSEYP10K | Daikin | 58 | 1 | 46 | -33.3 | -15 | 9.7 |
| RSXYP8L | Daikin | 57 | 1 | 46 | -33.3 | -15 | 8.7 |
| RSEYP8K | Daikin | 57 | 1 | 46 | -33.3 | -15 | 8.7 |
| RSEYP10K | Daikin | 58 | 1 | 47 | -33.4 | -15 | 9.6 |
| RSEYP10K | Daikin | 58 | 1 | 47 | -33.5 | -15 | 9.5 |
| RSEYP10K | Daikin | 58 | 1 | 45 | -33.0 | -15 | 10.0 |
| RSEYP8K | Daikin | 57 | 1 | 45 | -33.1 | -15 | 8.9 |
| RSXYP8L | Daikin | 57 | 1 | 46 | -33.3 | -15 | 8.7 |
| RSEYP10K | Daikin | 58 | 1 | 44 | -32.9 | -15 | 10.1 |
| RSEYP10K | Daikin | 58 | 1 | 45 | -33.1 | -15 | 9.9 |
| RSXYP8L | Daikin | 57 | 1 | 46 | -33.3 | -15 | 8.7 |
| RSEYP8K | Daikin | 57 | 1 | 48 | -33.5 | -15 | 8.5 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.8 | -15 | 9.2 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.8 | -15 | 9.2 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -33.9 | -15 | 9.1 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -34.0 | -15 | 9.0 |
| RSEYP10K | Daikin | 58 | 1 | 46 | -33.2 | -15 | 9.8 |
| RSEYP10K | Daikin | 58 | 1 | 47 | -33.4 | -15 | 9.6 |
| RSEYP10K | Daikin | 58 | 1 | 47 | -33.5 | -15 | 9.5 |
| RSEYP10K | Daikin | 58 | 1 | 48 | -33.6 | -15 | 9.4 |
| RSEYP10K | Daikin | 58 | 1 | 48 | -33.7 | -15 | 9.3 |
| RSEYP10K | Daikin | 58 | 1 | 47 | -33.4 | -15 | 9.6 |
| RSEYP10K | Daikin | 58 | 1 | 48 | -33.5 | -15 | 9.5 |
| RSEYP10K | Daikin | 58 | 1 | 48 | -33.6 | -15 | 9.4 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.8 | -15 | 9.2 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.9 | -15 | 9.1 |
| RSEYP10K | Daikin | 58 | 1 | 47 | -33.5 | -15 | 9.5 |
| RSEYP10K | Daikin | 58 | 1 | 48 | -33.6 | -15 | 9.4 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.7 | -15 | 9.3 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.8 | -15 | 9.2 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -34.0 | -15 | 9.0 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.7 | -15 | 9.3 |

Receptor R1



| Туре | Manufacturer | Lp | at, m | Dist to R1 | Dist loss, dB | Screening | Lp at R1 |
|----------------------|--------------|----|-------|---------------|------------------|----------------|----------|
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.8 | -15 | 9.2 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -33.9 | -15 | 9.1 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -34.0 | -15 | 9.0 |
| RSEYP10K | Daikin | 58 | 1 | 51 | -34.1 | -15 | 8.9 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.8 | -15 | 9.2 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -33.9 | -15 | 9.1 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -34.0 | -15 | 9.0 |
| RSEYP10K | Daikin | 58 | 1 | 51 | -34.1 | -15 | 8.9 |
| RSEYP10K | Daikin | 58 | 1 | 51 | -34.2 | -15 | 8.8 |
| RXS71BVMB | Daikin | 52 | 1 | 53 | -34.6 | -15 | 2.4 |
| PUHZ-ZRP100VKA | | 51 | 1 | 48 | -33.6 | -15 | 2.4 |
| PUZ-M100YKA | | 54 | 1 | 48 | -33.7 | -15 | 5.3 |
| RZQ125B9WB | | 53 | 1 | 49 | -33.8 | -15 | 4.2 |
| FTKS50BV | | 44 | 1 | 49 | -33.9 | -15 | -4.9 |
| RZQG100L8V1B | | 52 | 1 | 50 | -34.0 | -15 | 3.0 |
| PUHZ-RP60VHA4 | | 48 | 1 | 51 | -34.2 | -15 | -1.2 |
| RXS71FAV18 | | 52 | 1 | 52 | -34.3 | -15 | 2.7 |
| SRC71ZK-S | | 53 | 1 | 53 | -34.5 | -15 | 3.5 |
| Toilet extract fan | Typical | 40 | 1 | 44 | -32.8 | -15 | -7.8 |
| Emergency generator* | FG Wilson | 98 | Lw | 43 | -40.7 | -15 | 42.3 |
| | | | | | | Total at R1 | 27 |

*Emergency operation only – not included within total sound pressure level

Receptor R2

| Туре | Manufacturer | Lp | at, m | Dist to R2 | Dist loss, dB | Screening | Lp at R2 |
|----------|--------------|----|-------|---------------|------------------|-----------|----------|
| RSEYP10K | Daikin | 58 | 1 | 38 | -31.5 | -15 | 11.5 |
| RSEYP10K | Daikin | 58 | 1 | 37 | -31.3 | -15 | 11.7 |
| RSEYP8K | Daikin | 57 | 1 | 35 | -31.0 | -15 | 11.0 |
| RSXYP10L | Daikin | 58 | 1 | 35 | -30.8 | -15 | 12.2 |
| RSEYP8K | Daikin | 57 | 1 | 35 | -30.8 | -15 | 11.2 |
| RSEYP10K | Daikin | 58 | 1 | 37 | -31.4 | -15 | 11.6 |
| RSEYP10K | Daikin | 58 | 1 | 36 | -31.2 | -15 | 11.8 |
| RSEYP10K | Daikin | 58 | 1 | 35 | -30.9 | -15 | 12.1 |
| RSEYP8K | Daikin | 57 | 1 | 37 | -31.4 | -15 | 10.6 |
| RSXYP8L | Daikin | 57 | 1 | 35 | -30.9 | -15 | 11.1 |
| RSEYP10K | Daikin | 58 | 1 | 36 | -31.2 | -15 | 11.8 |
| RSEYP10K | Daikin | 58 | 1 | 41 | -32.3 | -15 | 10.7 |
| RSXYP8L | Daikin | 57 | 1 | 43 | -32.6 | -15 | 9.4 |
| RSEYP8K | Daikin | 57 | 1 | 44 | -32.9 | -15 | 9.1 |
| RSEYP10K | Daikin | 58 | 1 | 46 | -33.2 | -15 | 9.8 |
| RSEYP10K | Daikin | 58 | 1 | 47 | -33.5 | -15 | 9.5 |
| RSEYP10K | Daikin | 58 | 1 | 53 | -34.5 | -15 | 8.5 |
| RSEYP8K | Daikin | 57 | 1 | 53 | -34.5 | -15 | 7.5 |
| RSXYP8L | Daikin | 57 | 1 | 53 | -34.5 | -15 | 7.5 |
| RSEYP10K | Daikin | 58 | 1 | 57 | -35.1 | -15 | 7.9 |



| Тиро | Manufacturor | In | at m | Dist to | Dist loss, | Screening | In at P2 |
|----------------------|--------------|-----|------|---------|---------------|-------------|----------|
| PSEVP10K | Daikin | 58 | 1 | 59 | -35 / | -15 | 76 |
| RSXVP8I | Daikin | 57 | 1 | 60 | -35.6 | -15 | 6.4 |
| PCEVD&K | Daikin | 57 | 1 | 62 | -35.0 | -15 | 6.1 |
| RSEVP10K | Daikin | 58 | 1 | 64 | -36.1 | -15 | 6.9 |
| RSEVP10K | Daikin | 58 | 1 | 64 | -36.1 | -15 | 6.9 |
| | Daikin | 58 | 1 | 64 | -36.1 | -15 | 6.9 |
| | Daikin | 50 | 1 | 64 | 26.1 | -15 | 6.9 |
| | Daikin | 58 | 1 | 57 | -30.1 | -15 | 7.9 |
| | Daikin | 50 | 1 | 57 | -55.1 | -15 | 7.9 |
| | Daikin | 50 | 1 | 57 | 25.1 | -15 | 7.5 |
| | Daikin | 50 | 1 | 57 | -55.1 | -15 | 7.9 |
| | Daikin | 50 | 1 | 57 | 25.1 | -15 | 7.9 |
| | Daikin | 50 | 1 | 57 | -33.1 | -15 | 7.5 |
| | Daikin | 50 | 1 | 50 | -33.3 | -15 | 7.7 |
| | Daikin | 50 | 1 | 50 | -33.3 | -15 | 7.7 |
| | Daikin | 50 | 1 | 50 | -33.3 | -15 | 7.7 |
| | Daikin | 50 | 1 | 50 | -55.5 | -15 | 7.7 |
| | Daikin | 50 | 1 | 50 | -55.5 | -15 | 7.7 |
| | Daikin | 50 | 1 | 59 | -33.3 2E 4 | -15 | 7.5 |
| | Daikin | 58 | 1 | 59 | -35.4 | -15 | 7.0 |
| | Daikin | 50 | 1 | 50 | 25 / | -15 | 7.0 |
| | Daikin | 58 | 1 | 59 | -35.4 | -15 | 7.0 |
| | Daikin | 58 | 1 | 61 | -35.4 | -15 | 7.0 |
| RSEVP10K | Daikin | 58 | 1 | 61 | -35.7 | -15 | 7.3 |
| RSEVP10K | Daikin | 58 | 1 | 61 | -35.7 | -15 | 7.3 |
| RSEVP10K | Daikin | 58 | 1 | 61 | -35.7 | -15 | 7.3 |
| | Daikin | 58 | 1 | 61 | -35.7 | -15 | 7.3 |
| RSEVP10K | Daikin | 58 | 1 | 62 | -35.8 | -15 | 7.3 |
| RSEVP10K | Daikin | 58 | 1 | 62 | -35.8 | -15 | 7.2 |
| RSEVP10K | Daikin | 58 | 1 | 62 | -35.8 | -15 | 7.2 |
| RSEVP10K | Daikin | 58 | 1 | 62 | -35.8 | -15 | 7.2 |
| RSEYP10K | Daikin | 58 | 1 | 62 | -35.8 | -15 | 7.2 |
| RXS71BVMB | Daikin | 52 | 1 | 61 | -35.7 | -15 | 1.3 |
| PUH7-7RP100VKA | | 51 | 1 | 49 | -33.7 | -15 | 23 |
| PUZ-M100YKA | | 54 | 1 | 50 | -34.0 | -15 | 5.0 |
| RZO125B9WB | | 53 | 1 | 52 | -34.3 | -15 | 3.7 |
| FTKS50BV | | 44 | 1 | 53 | -34.6 | -15 | -5.6 |
| BZOG100L8V1B | | 52 | 1 | 55 | -34.8 | -15 | 22 |
| PUHZ-RP60VHA4 | | 48 | 1 | 57 | -35.1 | -15 | -2.1 |
| RXS71FAV18 | | 52 | 1 | 59 | -35.3 | -15 | 1.7 |
| SRC71ZK-S | | 53 | 1 | 60 | -35.6 | -15 | 2.4 |
| Toilet extract fan | Typical | 40 | 1 | 55 | -34.8 | -15 | -9.8 |
| Emergency generator* | FG Wilson | .98 | Lw | .5.3 | -42.6 | -15 | 40.4 |
| | | | | | | Total at R2 | 26 |

*Emergency operation only – not included within total sound pressure level



Third floor east (Tottenham Court Road) plant area – existing plant

| Receptor R | Receptor R1 | | | | | | | | | | |
|-----------------|--------------|----|-------|---------------|------------------|-------------|----------|--|--|--|--|
| Туре | Manufacturer | Lp | at, m | Dist to R1 | Dist loss, dB | Screening | Lp at R1 | | | | |
| VAM2000FA7VE | Daikin | 50 | 1 | 40 | -32.1 | -5 | 12.9 | | | | |
| VAM2000FA7VE | Daikin | 50 | 1 | 41 | -32.3 | -5 | 12.7 | | | | |
| VAM2000FA7VE | Daikin | 50 | 1 | 43 | -32.7 | -5 | 12.3 | | | | |
| VAM2000FA7VE | Daikin | 50 | 1 | 46 | -33.2 | -5 | 11.8 | | | | |
| VAM2000FA7VE | Daikin | 50 | 1 | 49 | -33.8 | -5 | 11.2 | | | | |
| PURY-RP200YKM-B | Mitsubishi | 56 | 1 | 39 | -31.7 | -5 | 19.3 | | | | |
| PURY-RP200YKM-B | Mitsubishi | 56 | 1 | 39 | -31.7 | -5 | 19.3 | | | | |
| PUH-P2.5VGAA | Mitsubishi | 50 | 1 | 39 | -31.7 | -5 | 13.3 | | | | |
| MUZ-AP71VG | Mitsubishi | 55 | 1 | 39 | -31.7 | -5 | 18.3 | | | | |
| RXY16MBW1B | Daikin | 60 | 1 | 41 | -32.3 | -5 | 22.7 | | | | |
| RXYQ12MBW1B | Daikin | 60 | 1 | 41 | -32.3 | -5 | 22.7 | | | | |
| RZQSG71L3V13 | Daikin | 50 | 1 | 41 | -32.3 | -5 | 12.7 | | | | |
| PUHZ-ZRP50VKA | Mitsubishi | 46 | 1 | 46 | -33.2 | -5 | 7.8 | | | | |
| SRC50ZJ-S | Mitsubishi | 53 | 1 | 36 | -31.2 | -5 | 16.8 | | | | |
| | | | | | | Total at R1 | 29 | | | | |

Receptor R2

| Turne | Manufasturar | 1.0 | | Dist to | Dist loss, | Sensoning | In at D2 |
|-----------------|--------------|-----|------------|---------|------------|-------------|----------|
| VAM2000EA7VE | Daikin | 50 | at, m 1 | 33 | -30.3 | O Screening | 129 |
| VAM2000FA7VE | Daikin | 50 | - 1 | 37 | -31 5 | 0 | 127 |
| | Daikin | 50 | 1 | 43 | -32.7 | 0 | 123 |
| | Daikii | 50 | 1 | 40 | 22.7 | 0 | 11.0 |
| VAM2000FA7VE | Daikin | 50 | 1 | 49 | -33.8 | 0 | 11.8 |
| VAM2000FA7VE | Daikin | 50 | 1 | 55 | -34.8 | 0 | 11.2 |
| PURY-RP200YKM-B | Mitsubishi | 56 | 1 | 32 | -30.0 | 0 | 11.8 |
| PURY-RP200YKM-B | Mitsubishi | 56 | 1 | 37 | -31.3 | 0 | 11.5 |
| PUH-P2.5VGAA | Mitsubishi | 50 | 1 | 42 | -32.6 | 0 | 13.1 |
| MUZ-AP71VG | Mitsubishi | 55 | 1 | 48 | -33.7 | 0 | 12.5 |
| RXY16MBW1B | Daikin | 60 | 1 | 46 | -33.3 | 0 | 26.7 |
| RXYQ12MBW1B | Daikin | 60 | 1 | 46 | -33.3 | 0 | 26.7 |
| RZQSG71L3V13 | Daikin | 50 | 1 | 46 | -33.3 | 0 | 16.7 |
| PUHZ-ZRP50VKA | Mitsubishi | 46 | 1 | 54 | -34.7 | 0 | 7.8 |
| SRC50ZJ-S | Mitsubishi | 53 | 1 | 32 | -30.0 | 0 | 16.8 |
| | | | | | | Total at R2 | 33 |



Third floor west (Percy Street) plant area – retained and new plant

| Receptor R1 | | | | | | | |
|-------------------|--------------|----|-------|---------------|------------------|--------------|----------|
| Туре | Manufacturer | Lp | at, m | Dist to R1 | Dist loss, dB | Screening | Lp at R1 |
| Retained Plant | | | | | | | |
| RXYQ16M8W1B | Daikin | 60 | 1 | 11 | -20.7 | 0 | 39.3 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 12 | -21.2 | 0 | 38.8 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 10 | -20.2 | 0 | 39.8 |
| REYQ16M8W1B | Daikin | 60 | 1 | 10 | -20.3 | 0 | 39.7 |
| REYQ10M7W1B | Daikin | 58 | 1 | 11 | -20.8 | 0 | 37.2 |
| REYQ10M7W1B | Daikin | 58 | 1 | 19 | -25.8 | 0 | 32.2 |
| RZQSG71L3V1B | Daikin | 50 | 1 | 22 | -26.9 | 0 | 23.1 |
| RSEYP10K7W1 | Daikin | 58 | 1 | 14 | -22.9 | 0 | 35.1 |
| RR71B7V3B | Daikin | 50 | 1 | 15 | -23.6 | 0 | 26.4 |
| RR71B7V3B | Daikin | 50 | 1 | 15 | -23.7 | 0 | 26.3 |
| Split unit | Daikin | 50 | 1 | 15 | -23.5 | 0 | 26.5 |
| RXS50L2V1B | Mitsubishi | 50 | 1 | 16 | -24.0 | 0 | 24.0 |
| RX50K2V1B | Mitsubishi | 55 | 1 | 22 | -26.7 | 0 | 21.3 |
| RAV-SP564ATP-E | Toshiba | 47 | 1 | 22 | -26.9 | 0 | 20.1 |
| ALB07*B(S) | Daikin | 41 | 1.5 | 16 | -20.5 | 0 | 20.5 |
| ECO541/W-E/DS/R/S | VES Andover | 40 | 1 | 3 | -8.0 | 0 | 32.0 |
| Moducel condenser | Moducel | 50 | 1 | 15 | -23.6 | 0 | 26.4 |
| | | | | Subtotal at I | R1 – retained | d plant only | 46.9 |
| New plant | | | | | | | |
| VAM1000J | Daikin | 42 | 1 | 6 | -15.2 | 0 | 26.8 |
| VAM1000J | Daikin | 42 | 1 | 17 | -24.6 | 0 | 17.4 |
| RZASG140MY1 | Daikin | 54 | 1 | 10 | -20.2 | 0 | 33.8 |
| RZASG140MY1 | Daikin | 54 | 1 | 10 | -20.3 | 0 | 33.7 |
| RZASG140MY1 | Daikin | 54 | 1 | 11 | -20.5 | 0 | 33.5 |
| | | | • | Subtota | l at R1 – nev | v plant only | 38.8 |

| Receptor R2 | 2 | | | | | | |
|----------------|--------------|----|-------|---------------|------------------|-----------|----------|
| Туре | Manufacturer | Lp | at, m | Dist to R2 | Dist loss, dB | Screening | Lp at R2 |
| Retained plant | | | | | | | |
| RXYQ16M8W1B | Daikin | 60 | 1 | 40 | -32.0 | 0 | 28.0 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 39 | -31.9 | 0 | 28.1 |
| RXYQ16M8W1B | Daikin | 60 | 1 | 34 | -30.5 | 0 | 29.5 |
| REYQ16M8W1B | Daikin | 60 | 1 | 34 | -30.7 | 0 | 29.3 |
| REYQ10M7W1B | Daikin | 58 | 1 | 36 | -31.2 | 0 | 26.8 |
| REYQ10M7W1B | Daikin | 58 | 1 | 35 | -30.9 | 0 | 27.1 |
| RZQSG71L3V1B | Daikin | 50 | 1 | 34 | -30.7 | 0 | 19.3 |
| RSEYP10K7W1 | Daikin | 58 | 1 | 38 | -31.5 | 0 | 26.5 |
| RR71B7V3B | Daikin | 50 | 1 | 30 | -29.6 | 0 | 20.4 |
| RR71B7V3B | Daikin | 50 | 1 | 32 | -30.1 | 0 | 19.9 |
| Split unit | Daikin | 50 | 1 | 35 | -30.9 | 0 | 19.1 |
| RXS50L2V1B | Mitsubishi | 50 | 1 | 34 | -30.7 | 0 | 17.3 |
| RX50K2V1B | Mitsubishi | 55 | 1 | 32 | -30.2 | 0 | 17.8 |



| Туре | Manufacturer | Lp | at, m | Dist to R2 | Dist loss, dB | Screening | Lp at R2 |
|--------------------------------------|--------------|----|-------|---------------|------------------|--------------|----------|
| RAV-SP564ATP-E | Toshiba | 47 | 1 | 34 | -30.7 | 0 | 16.3 |
| ALB07*B(S) | Daikin | 41 | 1.5 | 34 | -27.2 | 0 | 13.8 |
| ECO541/W-E/DS/R/S | VES Andover | 40 | 1 | 38 | -31.6 | 0 | 8.4 |
| Moducel condenser | Moducel | 50 | 1 | 31 | -29.8 | 0 | 20.2 |
| Subtotal at R2 – retained plant only | | | | | | | 37.1 |
| New plant | | | | | | | |
| VAM1000J | Daikin | 42 | 1 | 36 | -31.0 | 0 | 11.0 |
| VAM1000J | Daikin | 42 | 1 | 29 | -29.3 | 0 | 12.7 |
| RZASG140MY1 | Daikin | 54 | 1 | 34 | -30.5 | 0 | 23.5 |
| RZASG140MY1 | Daikin | 54 | 1 | 34 | -30.7 | 0 | 23.3 |
| RZASG140MY1 | Daikin | 54 | 1 | 35 | -30.9 | 0 | 23.1 |
| | | | | Subtota | l at R2 – nev | v plant only | 28.2 |

12th floor (Tower) plant area – retained and new plant

| Receptor R1 | - | | - | | - | | |
|----------------------|--------------------------------------|----|-------|---------------|------------------|-----------|----------|
| Туре | Manufacturer | Lo | at. m | Dist to R1 | Dist loss, dB | Screening | Lp at R1 |
| Retained Plant | | | | | | | |
| RSEYP10K | Daikin | 58 | 1 | 46 | -33.2 | -15 | 9.8 |
| RSEYP10K | Daikin | 58 | 1 | 47 | -33.4 | -15 | 9.6 |
| RSEYP10K | Daikin | 58 | 1 | 47 | -33.5 | -15 | 9.5 |
| RSEYP10K | Daikin | 58 | 1 | 48 | -33.6 | -15 | 9.4 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.8 | -15 | 9.2 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -34.0 | -15 | 9.0 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.7 | -15 | 9.3 |
| RSEYP10K | Daikin | 58 | 1 | 49 | -33.8 | -15 | 9.2 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -33.9 | -15 | 9.1 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -34.0 | -15 | 9.0 |
| RSEYP10K | Daikin | 58 | 1 | 50 | -34.0 | -15 | 9.0 |
| RSEYP10K | Daikin | 58 | 1 | 51 | -34.1 | -15 | 8.9 |
| RSEYP10K | Daikin | 58 | 1 | 51 | -34.2 | -15 | 8.8 |
| RXS71BVMB | Daikin | 52 | 1 | 53 | -34.6 | -15 | 2.4 |
| PUHZ-ZRP100VKA | | 51 | 1 | 48 | -33.6 | -15 | 2.4 |
| PUZ-M100YKA | | 54 | 1 | 48 | -33.7 | -15 | 5.3 |
| RZQ125B9WB | | 53 | 1 | 49 | -33.8 | -15 | 4.2 |
| FTKS50BV | | 44 | 1 | 49 | -33.9 | -15 | -4.9 |
| RZQG100L8V1B | | 52 | 1 | 50 | -34.0 | -15 | 3.0 |
| PUHZ-RP60VHA4 | | 48 | 1 | 51 | -34.2 | -15 | -1.2 |
| RXS71FAV18 | | 52 | 1 | 52 | -34.3 | -15 | 2.7 |
| SRC71ZK-S | | 53 | 1 | 53 | -34.5 | -15 | 3.5 |
| Toilet extract fan | Typical | 40 | 1 | 44 | -32.8 | -15 | -7.8 |
| Emergency generator* | FG Wilson | 98 | Lw | 43 | -40.7 | -15 | 42.3 |
| | Subtotal at R1 – retained plant only | | | | | | |
| New plant | | | | | | | |
| REYQ10U | Daikin | 57 | 1 | 39 | -31.7 | -15 | 10.3 |



| Туре | Manufacturer | Lp | at, m | Dist to R1 | Dist loss, dB | Screening | Lp at R1 |
|---------|--------------|----|-------|---------------|------------------|--------------|----------|
| REYQ10U | Daikin | 57 | 1 | 39 | -31.8 | -15 | 10.2 |
| REYQ10U | Daikin | 57 | 1 | 39 | -31.9 | -15 | 10.1 |
| REYQ10U | Daikin | 57 | 1 | 41 | -32.2 | -15 | 9.8 |
| REYQ10U | Daikin | 57 | 1 | 42 | -32.5 | -15 | 9.5 |
| REYQ10U | Daikin | 57 | 1 | 41 | -32.2 | -15 | 9.8 |
| REYQ10U | Daikin | 57 | 1 | 41 | -32.2 | -15 | 9.8 |
| REYQ10U | Daikin | 57 | 1 | 41 | -32.3 | -15 | 9.7 |
| REYQ10U | Daikin | 57 | 1 | 41 | -32.3 | -15 | 9.7 |
| REYQ10U | Daikin | 57 | 1 | 42 | -32.4 | -15 | 9.6 |
| REYQ10U | Daikin | 57 | 1 | 41 | -32.4 | -15 | 9.6 |
| REYQ10U | Daikin | 57 | 1 | 46 | -33.3 | -15 | 8.7 |
| REYQ10U | Daikin | 57 | 1 | 46 | -33.3 | -15 | 8.7 |
| REYQ10U | Daikin | 57 | 1 | 46 | -33.3 | -15 | 8.7 |
| REYQ10U | Daikin | 57 | 1 | 47 | -33.4 | -15 | 8.6 |
| REYQ10U | Daikin | 57 | 1 | 47 | -33.5 | -15 | 8.5 |
| | | | | Subtot | al at R1 – nev | w plant only | 21.5 |

*Emergency operation only – not included within total sound pressure level

Receptor R2

| Туре | Manufacturer | Lp | at, m | Dist to R2 | Dist loss, dB | Screening | Lp at R2 |
|----------------------|--------------|----|-------|---------------|------------------|--------------|----------|
| Retained plant | | | | | | | |
| RSEYP10K | Daikin | 58 | 1 | 57 | -35.1 | -15 | 7.9 |
| RSEYP10K | Daikin | 58 | 1 | 57 | -35.1 | -15 | 7.9 |
| RSEYP10K | Daikin | 58 | 1 | 57 | -35.1 | -15 | 7.9 |
| RSEYP10K | Daikin | 58 | 1 | 59 | -35.4 | -15 | 7.6 |
| RSEYP10K | Daikin | 58 | 1 | 59 | -35.4 | -15 | 7.6 |
| RSEYP10K | Daikin | 58 | 1 | 61 | -35.7 | -15 | 7.3 |
| RSEYP10K | Daikin | 58 | 1 | 61 | -35.7 | -15 | 7.3 |
| RSEYP10K | Daikin | 58 | 1 | 61 | -35.7 | -15 | 7.3 |
| RSEYP10K | Daikin | 58 | 1 | 61 | -35.7 | -15 | 7.3 |
| RSEYP10K | Daikin | 58 | 1 | 62 | -35.8 | -15 | 7.2 |
| RSEYP10K | Daikin | 58 | 1 | 62 | -35.8 | -15 | 7.2 |
| RSEYP10K | Daikin | 58 | 1 | 62 | -35.8 | -15 | 7.2 |
| RXS71BVMB | Daikin | 52 | 1 | 61 | -35.7 | -15 | 1.3 |
| PUHZ-ZRP100VKA | | 51 | 1 | 49 | -33.7 | -15 | 2.3 |
| PUZ-M100YKA | | 54 | 1 | 50 | -34.0 | -15 | 5.0 |
| RZQ125B9WB | | 53 | 1 | 52 | -34.3 | -15 | 3.7 |
| FTKS50BV | | 44 | 1 | 53 | -34.6 | -15 | -5.6 |
| RZQG100L8V1B | | 52 | 1 | 55 | -34.8 | -15 | 2.2 |
| PUHZ-RP60VHA4 | | 48 | 1 | 57 | -35.1 | -15 | -2.1 |
| RXS71FAV18 | | 52 | 1 | 59 | -35.3 | -15 | 1.7 |
| SRC71ZK-S | | 53 | 1 | 60 | -35.6 | -15 | 2.4 |
| Toilet extract fan | Typical | 40 | 1 | 55 | -34.8 | -15 | -9.8 |
| Emergency generator* | FG Wilson | 98 | Lw | 53 | -42.6 | -15 | 40.4 |
| | | | | Subtotal at | R2 – retaine | d plant only | 19.1 |



| Туре | Manufacturer | In | at m | Dist to | Dist loss, dB | Screening | In at R2 |
|---------|--------------|----|------|---------|------------------|--------------|----------|
| REYQ10U | Daikin | 57 | 1 | 38 | -31.5 | -15 | 10.5 |
| REYQ10U | Daikin | 57 | 1 | 37 | -31.3 | -15 | 10.7 |
| REYQ10U | Daikin | 57 | 1 | 35 | -31.0 | -15 | 11.0 |
| REYQ10U | Daikin | 57 | 1 | 35 | -30.8 | -15 | 11.2 |
| REYQ10U | Daikin | 57 | 1 | 35 | -30.8 | -15 | 11.2 |
| REYQ10U | Daikin | 57 | 1 | 37 | -31.4 | -15 | 10.6 |
| REYQ10U | Daikin | 57 | 1 | 36 | -31.2 | -15 | 10.8 |
| REYQ10U | Daikin | 57 | 1 | 35 | -30.9 | -15 | 11.1 |
| REYQ10U | Daikin | 57 | 1 | 37 | -31.4 | -15 | 10.6 |
| REYQ10U | Daikin | 57 | 1 | 35 | -30.9 | -15 | 11.1 |
| REYQ10U | Daikin | 57 | 1 | 36 | -31.2 | -15 | 10.8 |
| REYQ10U | Daikin | 57 | 1 | 41 | -32.3 | -15 | 9.7 |
| REYQ10U | Daikin | 57 | 1 | 43 | -32.6 | -15 | 9.4 |
| REYQ10U | Daikin | 57 | 1 | 44 | -32.9 | -15 | 9.1 |
| REYQ10U | Daikin | 57 | 1 | 46 | -33.2 | -15 | 8.8 |
| REYQ10U | Daikin | 57 | 1 | 47 | -33.5 | -15 | 8.5 |
| | | | | Subtot | al at R2 – nev | w plant only | 22.4 |

*Emergency operation only – not included within total sound pressure level



Third floor east (Tottenham Court Road) plant area – retained and new plant

| Receptor R | 21 | | | Distan | Disting | | | |
|-----------------|--------------|--------------------------------------|-------|--------|-----------------|---------------|----------|--|
| Туре | Manufacturer | Lp | at, m | R1 | dB | Screening | Lp at R1 | |
| Retained plant | | | | | | | | |
| PURY-RP200YKM-B | Mitsubishi | 56 | 1 | 39 | -31.7 | -5 | 19.3 | |
| PURY-RP200YKM-B | Mitsubishi | 56 | 1 | 39 | -31.7 | -5 | 19.3 | |
| PUH-P2.5VGAA | Mitsubishi | 50 | 1 | 39 | -31.7 | -5 | 13.3 | |
| MUZ-AP71VG | Mitsubishi | 55 | 1 | 39 | -31.7 | -5 | 18.3 | |
| RXY16MBW1B | Daikin | 60 | 1 | 41 | -32.3 | -5 | 22.7 | |
| RXYQ12MBW1B | Daikin | 60 | 1 | 41 | -32.3 | -5 | 22.7 | |
| RZQSG71L3V13 | Daikin | 50 | 1 | 41 | -32.3 | -5 | 12.7 | |
| PUHZ-ZRP50VKA | Mitsubishi | 46 | 1 | 46 | -33.2 | -5 | 7.8 | |
| SRC50ZJ-S | Mitsubishi | 53 | 1 | 36 | -31.2 | -5 | 16.8 | |
| | | Subtotal at R1 – retained plant only | | | | | | |
| VAM1000J | Daikin | 42 | 1 | 40 | -32.1 | -5 | 4.9 | |
| VAM1000J | Daikin | 42 | 1 | 41 | -32.3 | -5 | 4.7 | |
| VAM1000J | Daikin | 42 | 1 | 43 | -32.7 | -5 | 4.3 | |
| VAM1000J | Daikin | 42 | 1 | 46 | -33.2 | -5 | 3.8 | |
| VAM1000J | Daikin | 50 | 1 | 49 | -33.8 | -5 | 11.2 | |
| RZASG140MY1 | Daikin | 54 | 1 | 37 | -31.3 | -5 | 17.7 | |
| RZASG140MY1 | Daikin | 54 | 1 | 37 | -31.3 | -5 | 17.7 | |
| RZASG140MY1 | Daikin | 54 | 1 | 37 | -31.3 | -5 | 17.7 | |
| RZASG140MY1 | Daikin | 54 | 1 | 38 | -31.7 | -5 | 17.3 | |
| RZASG140MY1 | Daikin | 54 | 1 | 38 | -31.7 | -5 | 17.3 | |
| RZASG140MY1 | Daikin | 54 | 1 | 38 | -31.7 | -5 | 17.3 | |
| RZASG140MY1 | Daikin | 54 | 1 | 44 | -32.8 | -5 | 16.2 | |
| RZASG140MY1 | Daikin | 54 | 1 | 44 | -32.8 | -5 | 16.2 | |
| RZASG140MY1 | Daikin | 54 | 1 | 44 | -32.8 | -5 | 16.2 | |
| | | | | Subto | otal at R1 – no | ew plant only | 26.9 | |

| Receptor R | 22 | | | | | | |
|-----------------|--------------|----|-------|---------------|------------------|---------------|----------|
| Туре | Manufacturer | Lp | at, m | Dist to R2 | Dist loss, dB | Screening | Lp at R2 |
| Retained plant | | | | | | | |
| PURY-RP200YKM-B | Mitsubishi | 56 | 1 | 32 | -30.0 | 0 | 11.8 |
| PURY-RP200YKM-B | Mitsubishi | 56 | 1 | 37 | -31.3 | 0 | 11.5 |
| PUH-P2.5VGAA | Mitsubishi | 50 | 1 | 42 | -32.6 | 0 | 13.1 |
| MUZ-AP71VG | Mitsubishi | 55 | 1 | 48 | -33.7 | 0 | 12.5 |
| RXY16MBW1B | Daikin | 60 | 1 | 46 | -33.3 | 0 | 26.7 |
| RXYQ12MBW1B | Daikin | 60 | 1 | 46 | -33.3 | 0 | 26.7 |
| RZQSG71L3V13 | Daikin | 50 | 1 | 46 | -33.3 | 0 | 16.7 |
| PUHZ-ZRP50VKA | Mitsubishi | 46 | 1 | 54 | -34.7 | 0 | 7.8 |
| SRC50ZJ-S | Mitsubishi | 53 | 1 | 32 | -30.0 | 0 | 16.8 |
| | | • | • | Subtotal | at R2 – retain | ed plant only | 30.4 |



| Turne | Manufacturer | 1 | | Dist to | Dist loss, | Companying a | Im of D2 |
|-------------|--------------|----|-------|---------|----------------|---------------|----------|
| Туре | Manufacturer | ∟р | at, m | R2 | ۵B | Screening | Lp at R2 |
| VAM1000J | Daikin | 42 | 1 | 33 | -30.3 | 0 | 11.7 |
| VAM1000J | Daikin | 42 | 1 | 37 | -31.5 | 0 | 10.5 |
| VAM1000J | Daikin | 42 | 1 | 43 | -32.7 | 0 | 9.3 |
| VAM1000J | Daikin | 42 | 1 | 49 | -33.8 | 0 | 8.2 |
| VAM1000J | Daikin | 50 | 1 | 55 | -34.8 | 0 | 15.2 |
| RZASG140MY1 | Daikin | 54 | 1 | 35 | -30.8 | 0 | 23.2 |
| RZASG140MY1 | Daikin | 54 | 1 | 35 | -30.8 | 0 | 23.2 |
| RZASG140MY1 | Daikin | 54 | 1 | 35 | -30.8 | 0 | 23.2 |
| RZASG140MY1 | Daikin | 54 | 1 | 39 | -31.9 | 0 | 22.1 |
| RZASG140MY1 | Daikin | 54 | 1 | 39 | -31.9 | 0 | 22.1 |
| RZASG140MY1 | Daikin | 54 | 1 | 39 | -31.9 | 0 | 22.1 |
| RZASG140MY1 | Daikin | 54 | 1 | 51 | -34.2 | 0 | 19.8 |
| RZASG140MY1 | Daikin | 54 | 1 | 51 | -34.2 | 0 | 19.8 |
| RZASG140MY1 | Daikin | 54 | 1 | 51 | -34.2 | 0 | 19.8 |
| | | | | Subto | otal at R2 – n | ew plant only | 31.7 |