RBA ACOUSTICS

# PADDY POWER, 64 KILBURN HIGH ROAD, LONDON NW6 4HJ

## Plant Noise Assessment

REPORT 6876/PNA
Prepared: 26 June 2015
Revision Number: 0

Power Leisure Bookmakers Ltd
Paddy Tower, Blocks 1-3
Belfield Office Park
Beech Hill Road
Clonskeagh
Dublin

# Plant Noise Assessment

## PADDY POWER, 64 KILBURN HIGH ROAD
## LONDON NW6 4HJ

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## Prepared: 26 June 2015

| Revision | Comment | Date | Prepared By | Approved By |
|---|---|---|---|---|
| 0 | First issue of report | 26 June 2015 | Andreas Valiantis | Mike Fuller |
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# 1.0 INTRODUCTION

In order to complete the planning application for the location of new mechanical services units at Paddy Power, 64 Kilburn High Road, London NW6 4HJ, Camden Council requires consideration be given to atmospheric noise emissions from the proposed equipment at the nearest noise sensitive property.

RBA Acoustics have been commissioned to undertake measurements of the prevailing noise conditions at the site and to determine the atmospheric noise emissions in accordance with Camden Council's requirements. This report presents the results of the noise measurements, associated criteria and provides the required assessment.

# 2.0 ENVIRONMENTAL NOISE SURVEY

## 2.1 General

In accordance with the requirements of the Local Authority, monitoring of the prevailing background noise was undertaken from Wednesday 17 June to Thursday 18 June 2015. During the survey periods the weather conditions were generally appropriate for the noise measurement exercise, it being dry with light winds.

Measurements were made of the $L_{A90}$, $L_{AMax}$ and $L_{Aeq}$ noise levels over sample periods of 15 minutes duration.

## 2.2 Measurement Location

Measurements were undertaken with the microphone positioned at the roof of the first floor level to the rear of 64 Kilburn High Road. This measurement position was considered as being representative of the noise climate as experienced at the closest residential receptors to the proposed plant to the rear of the property. The prevailing noise climate was noted to be quiet as the rear of the property was generally screened from local traffic.

The measurement position is also illustrated on the attached Site Plan 6876/SP1.

## 2.3 Instrumentation

The following equipment was used for the measurements.

Table 6876/T1 – Equipment Details

| Manufacturer | Model Type | Serial No. | Calibration | |
|---|---|---|---|---|
| | | | Certificate No. | Valid Until |
| Norsonic Type 1 Sound Level Meter | Nor140 | 1406007 | 473728419 | 10 June 2016 |
| Norsonic Pre Amplifier | 1209 | 20043 | | |
| Norsonic ½" Microphone | 1225 | 208146 | | |
| Norsonic Sound Calibrator | 1251 | 34127 | CAL 022-2014-4647 | 1 July 2016 |

The sound level meter was calibrated both prior to and on completion of the survey with no calibration drift observed.

# 3.0 OPERATIONAL HOURS

Paddy Power's proposed opening hours are between 08:00 and 22:00 hours, with the condenser units to be operational during this period only. We have therefore undertaken our analysis based on the background noise levels during this period.

# 4.0 RESULTS

The noise levels at the measurement positions are shown as time-histories on the attached charts 6876/G1 and 6876/G2.

In order to ensure a worst case assessment the lowest background $L_{A90}$ noise levels measured have been used in our analyses. The lowest $L_{A90}$ and the period averaged $L_{Aeq}$ dB noise levels measured are summarised below.

Table 6876/T2 – Measured Levels

| Measurement Period | Position 1 | |
|---|---|---|
| | $L_{90}$ (dBA) | $L_{eq}$ (dBA) |
| Operational Hours (08:00 – 22:00) | 44 | 53 |

# 5.0 CRITERIA

The requirements of the London Borough of Camden for noise levels from new plant and machinery are detailed in Development Policy 28 (DP28) of the Core Strategies document. These requirements are repeated below.

Table 6876/T3 – London Borough of Camden Plant Noise Criteria

| Noise Description and Location of Measurement | Period | Time | Noise Level |
|---|---|---|---|
| Noise at 1 metre external to a sensitive facade | Day, evening and night | 00:00 - 24:00 | 5dB < 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 | 00:00 - 24:00 | 10dB < LA90 |
| Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade | Day, evening and night | 00:00 - 24:00 | 10dB < LA90 |
| Noise at 1 metre external to sensitive façade where LA90 > 60dB | Day, evening and night | 00:00 - 24:00 | 55dB LAeq |

In line with the above requirements we would propose items of mechanical services be designed so that noise emissions from the plant do not exceed the following level when assessed at the nearest noise sensitive location:

- Operational Hours (08:00 - 22.00): 39 dBA

# 6.0 ASSESSMENT

Our assessment has been based upon the following information:

## 6.1 Proposed Air Conditioning Unit

1No. Daikin RZQS-140
1No. Daikin RX25

## 6.2 Position of Units

The equipment is to be located to the rear of the property on the existing first floor roof. The equipment position is indicated on the attached Figure 6876/F1.

## 6.3 Noise Levels

Information regarding the noise levels of the proposed plant has been provided by the manufacturer of the unit. The octave band sound pressure levels of the unit (at 1m) are detailed as follows:

Table 6876/T3 – Manufacturer's Noise Levels

| Unit | Data Type | Octave Band Frequency (Hz) $L_p$ at 1m (dB) | | | | | | | | dBA |
|---|---|---|---|---|---|---|---|---|---|---|
| | | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Daikin RZQS-140 | $L_p$ at 1m | 55 | 55 | 42 | 53 | 49 | 45 | 41 | 36 | 54 |
| Daikin RXS25 | $L_p$ at 1m | 40 | 45 | 43 | 41 | 38 | 32 | 27 | 19 | 43 |

Review of the octave band data concludes that there are no tonal characteristics associated with the proposed plant.

## 6.4 Location of Nearest Residential Windows

We understand the second and third floor levels of 64 Kilburn High Road are not going to be for residential purposes. In order to ensure a worst case assessment, we have therefore used the nearest window for our assessment which is located at the rear of 66 Kilburn High Road on the second floor level.

## 6.5 Calculation of Noise Levels at Nearest Residential Window

Our calculation method for predicting noise levels from the proposed air conditioning units at the nearest residential window, based on the information stated above, is summarised below.

- Source Term SPL
- Reflections
- Directivity
- 20LogR Distance Attenuation
- Screening Attenuation

Calculation sheets are attached for further information in Appendix B.

The results of the calculations indicate the following noise levels at the nearest affected residential windows:

Table 6876/T4 – Predicted Noise Levels

| Operating Period | Prediction at 2nd floor of the rear of 66 Kilburn High Road | Criterion |
|---|---|---|
| Operational Hours (08:00 – 22:00) | 39dBA | 39dBA |

Noise from the proposed units to the rear of the property achieves the target criterion and, as such, should be considered acceptable.

## 7.0 VIBRATION CONTROL

In addition to the control of airborne noise transfer, it is also important to consider the transfer of noise as vibration to adjacent properties (as well as to any sensitive areas of the same building).

We would typically advise that condensing units be isolated from the supporting structure by means of either steel spring isolators or rubber footings. For particularly sensitive locations, or when on lightweight structures the mounts should ideally be caged and be of the restrained type.

It is important the isolation is not "short-circuited" by associated pipework or conduits. To this end, any conduits should be looped and flexible connectors should be introduced between the condenser and any associated pipework. Pipework should be supported by brackets containing neoprene inserts.

## 8.0 CONCLUSION

Measurements of the existing background noise levels at Paddy Power, 64 Kilburn High Road, London NW6 4HJ have been undertaken. The results of the measurements have been used in order to determine the required criteria for atmospheric noise emissions from the future plant installations.

The results of the assessment indicate atmospheric noise emissions from the plant are within the criteria required by Camden Council. As such, the proposed plant installations should be considered acceptable.

# Appendix A - Acoustic Terminology

| | |
|---|---|
| dB | Decibel - Used as a measurement of sound pressure level. It is the logarithmic ratio of the noise being assessed to a standard reference level. |
| dB(A) | The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible. |
| $L_{eq}$ | $L_{eq}$ is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (1 hour). |
| $L_{Aeq}$ | The level of notional steady sound which, over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measured over that period. |
| $L_{An}$ (e.g $L_{A10}$, $L_{A90}$) | If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The $L_n$ indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence $L_{10}$ is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, $L_{90}$ is the average minimum level and is often used to describe the background noise. |
| $L_{max,T}$ | The instantaneous maximum sound pressure level which occurred during the measurement period, T. It is commonly used to measure the effect of very short duration bursts of noise, such as for example sudden bangs, shouts, car horns, emergency sirens etc. which audibly stand out from the general level of, say, traffic noise, but because of their very short duration, maybe only a very small fraction of a second, may not have any effect on the $L_{eq}$ value. |

# Appendix B – Plant calculations

## Received Noise Levels Summary

| Unit | Predicted Receive Levels to rear of 66 Kilburn High Road (dBA) |
|---|---|
| Daikin RZQS-140 | 39 |
| Daikin RX25 | 28 |
| Total Received Level (dBA) | 39 |

Table 6876/T6 – Predicted Noise Levels Example Calculation

| Calculation Factor | Noise Level (dB) at Octave Band Centre Frequency (Hz) | | | | | | | | dBA |
|---|---|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k | 8k | |
| Daikin RZQS-140 (Lp at 1m) | 55 | 55 | 42 | 53 | 49 | 45 | 41 | 36 | 54 |
| Reflections | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Distance Loss (5m) | -15 | -15 | -15 | -15 | -15 | -15 | -15 | -15 | |
| Screening | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | |
| Received Level at 66 Kilburn High Road | 40 | 40 | 27 | 38 | 34 | 30 | 26 | 21 | 39 |

Paddy Power, 64 Kilburn High Road

$L_{Aeq}$ Time History

Measurement Position 1, Wednesday 17th June to Thursday 18th June 2015

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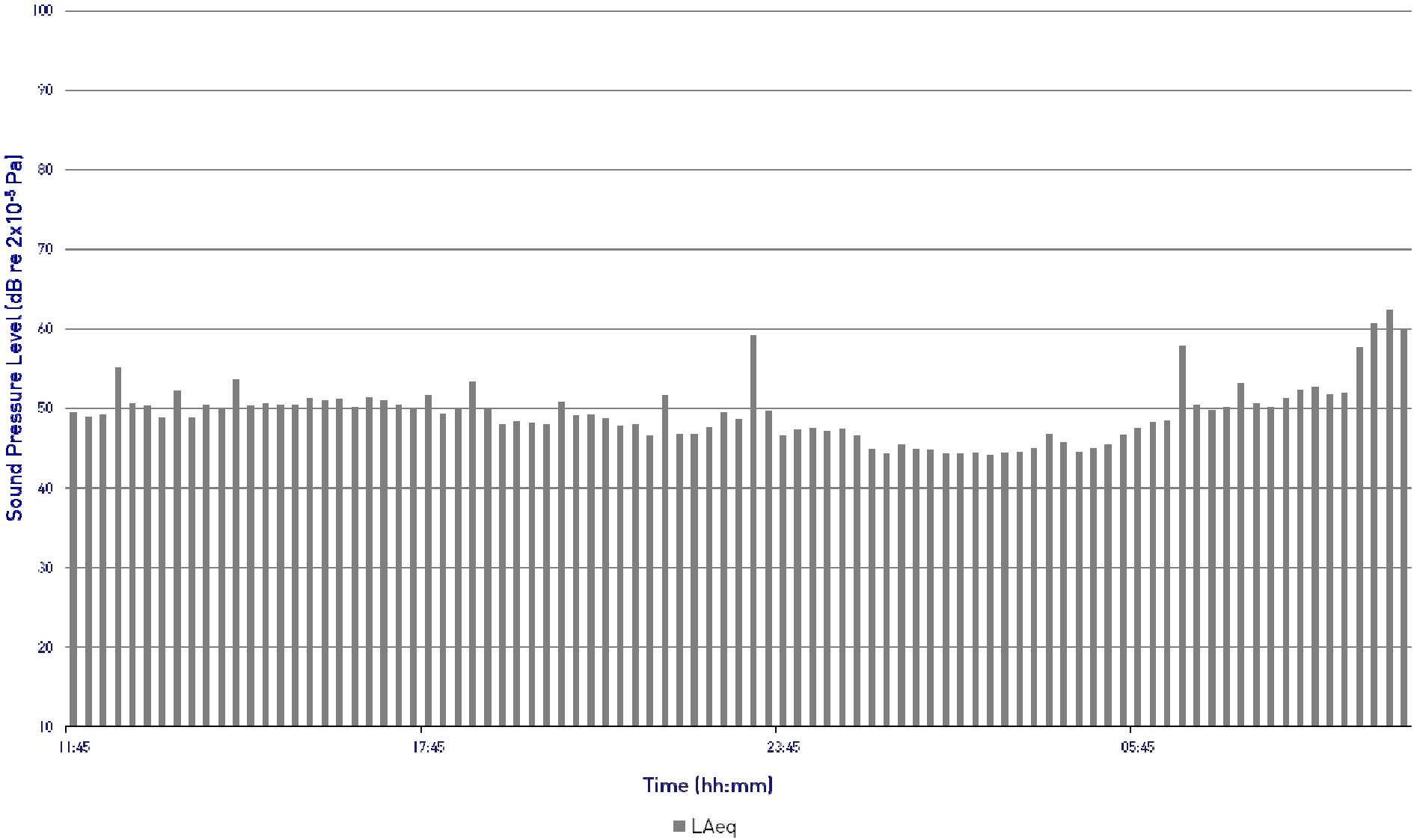
Graph 6876/G1



Paddy Power, 64 Kilburn High Road

$L_{Amax}$ and $L_{A90}$ Time History

Measurement Position 1, Wednesday 17th June to Thursday 18th June 2015

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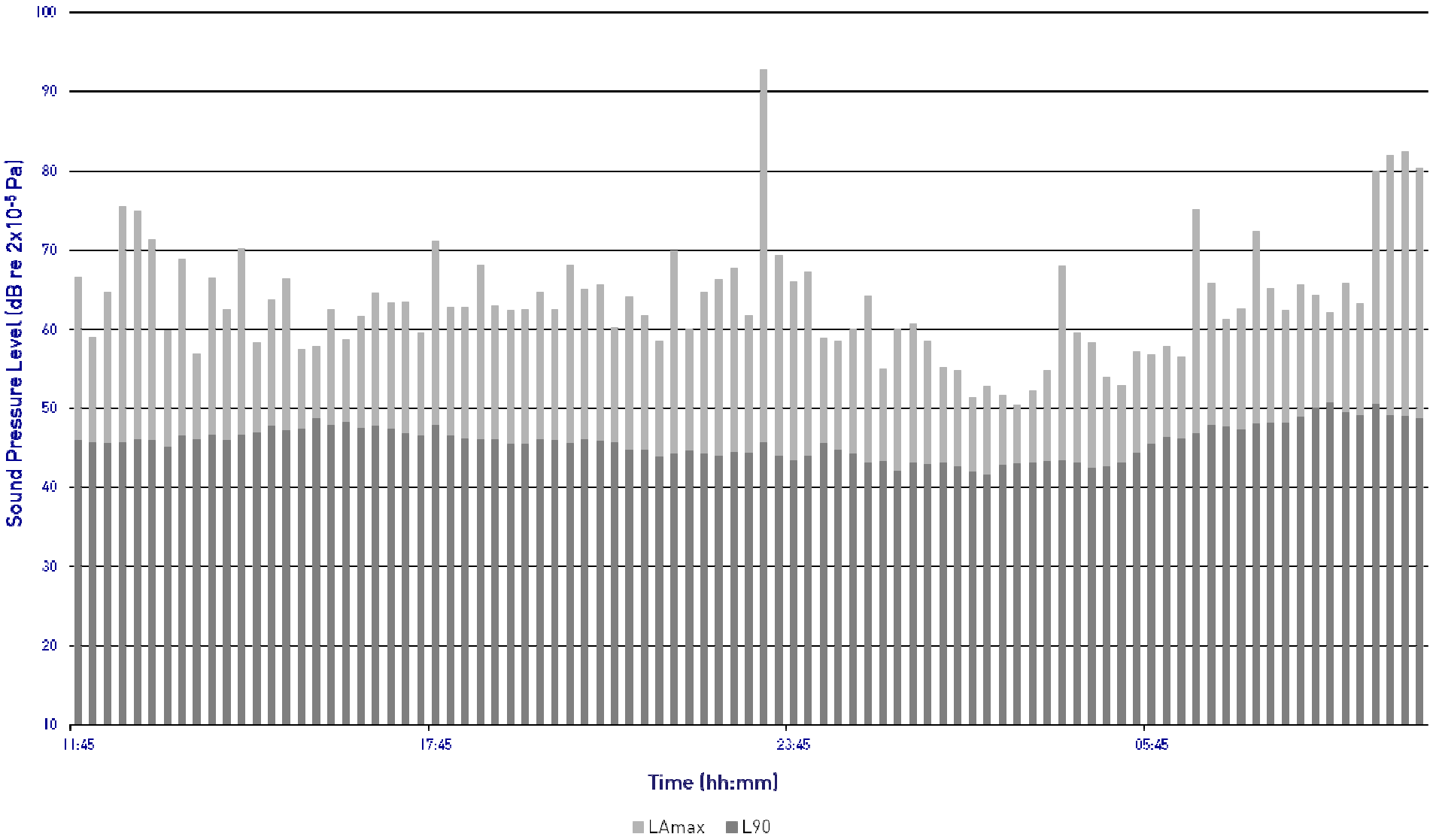
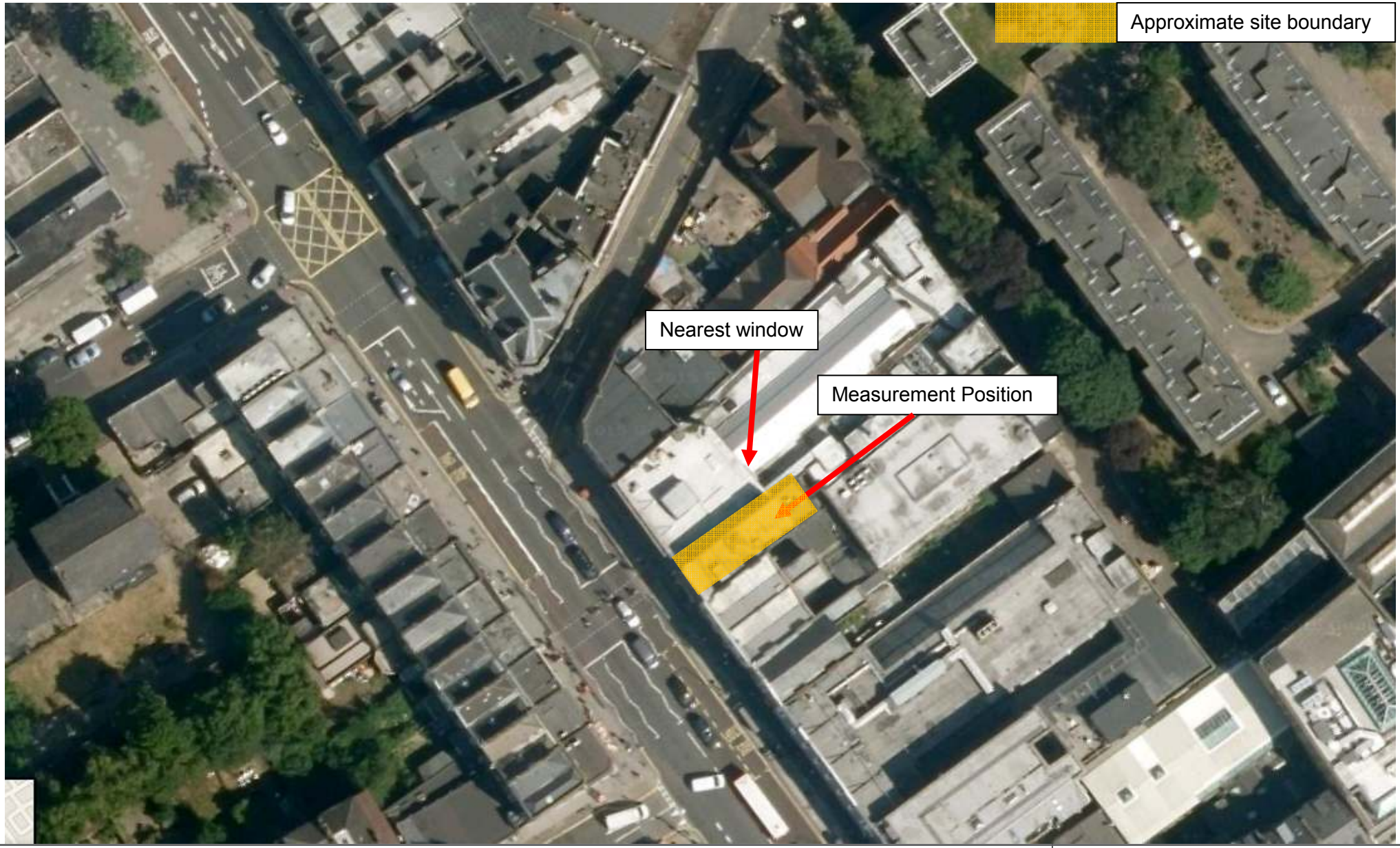
Graph 6876/G2






Paddy Power, 64 Kilburn High Road, London NW6 4HJ

Site Plan

Figure 6876/SP1

26 June 2015

Not to Scale

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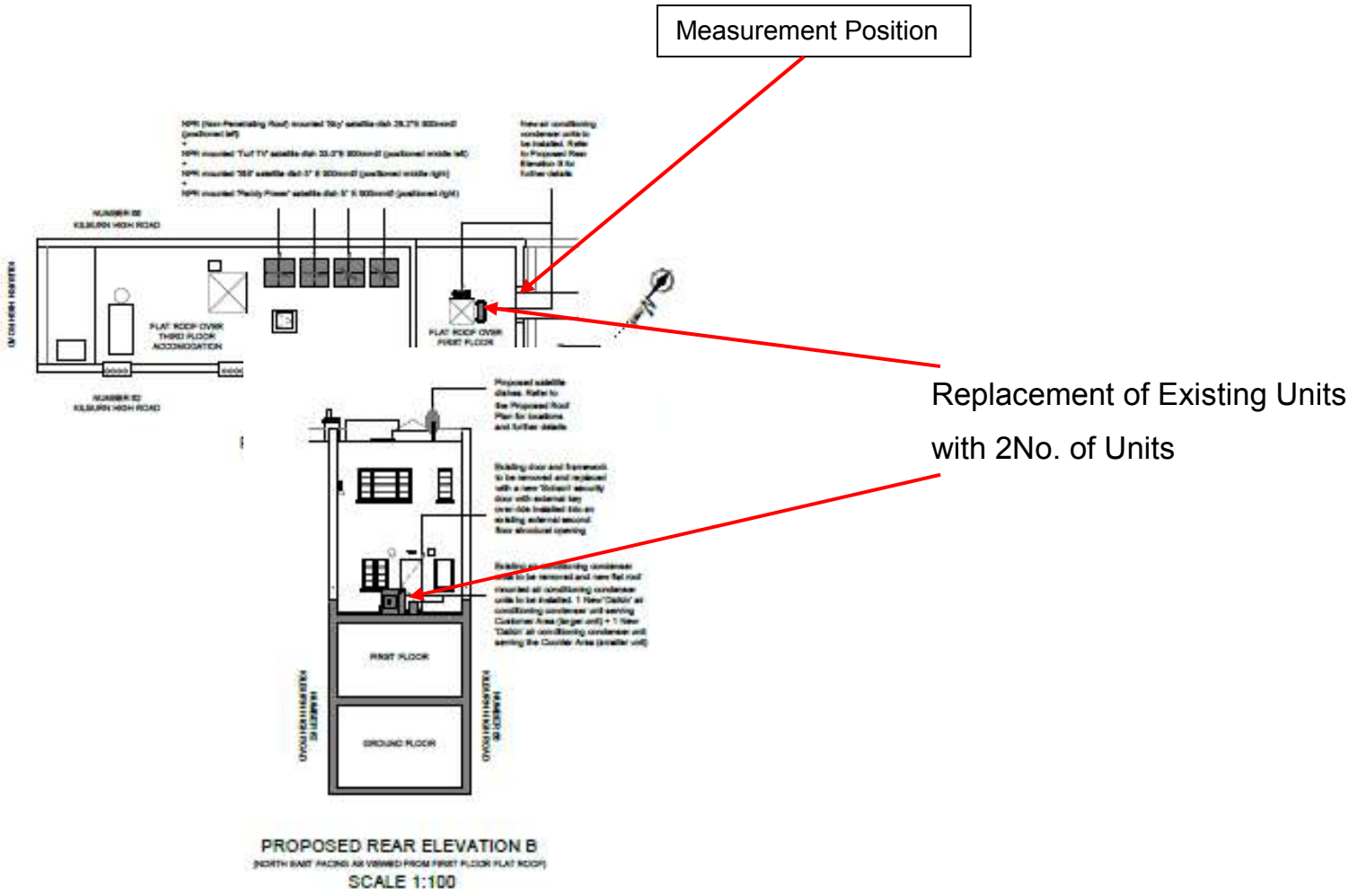


Paddy Power, 64 Kilburn High Road, London NW6 4HJ

Figure 1 Showing Location of the Plant

Figure 6876/F1

26 June 2015

Not to Scale

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Paddy Power, 64 Kilburn High Road, London NW6 4HJ

Measurement Position

Figure 6876/P1

26 June 2015

Not to Scale

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