NVP

NOISE AND VIBRATION PARTNERSHIP

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**PROJECT NO: 1352/2**

**DATE:** 9th March 2017

**CLIENT:**

Brightwood Ltd
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105 Wigmore Street
London W1U 1QY

**PROJECT:**

46 Avenue Road London NW8. Examination of latest development proposals and recommendations for attenuation of mechanical services noise atmosphere.

**PREPARED BY:**

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## 1. BRIEF FOR CONSULTANCY

1) To assess latest proposals for mechanical service for the project.

2) To propose limiting sound power emission from plant louvres to comply with BS 4142;2014 (Ref 1).

## 2. SUMMARY

Background noise levels have been measured in the rear garden of the project.

The minimum measured background level has been used, in conjunction with BS4142, to assess suitable treatment for the cooling plant located at the rear of the garden and roof mounted heat pumps.

The inlet and discharge louvres for the Heat Recovery Unit should be double bank acoustic louvres having the following Dynamic Insertion Loss:

| | Octave Band Hz | | | | | | |
|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k |
| D.I.L. dB | 10 | 10 | 13 | 20 | 26 | 28 | 23 |

No attenuation treatment will be required for the roof mounted inverter heat pumps.

Director

## 3. INTRODUCTION

It is intended to rebuild and provide an underground swimming pool and leisure areas in the garden of of no. 46 Avenue Road London NW8.

## 4. SURVEY

Noise measurements were made on 25th and 26th October 2010 using the following equipment.

Bruel and Kjaer:

Precision Sound Level Meter Type 2206

Noise measurements were made over a 24 hour period in the garden of the property (See appended chart).

Measurements complied in all respects with current British and International Standards. Equipment was calibrated before and after use with a calibrator having and accuracy of +/- 0.3dB.

## 5. RESULTS

The most important parameter for the assessment of noise nuisance to the neighbourhood is the $LA_{90}$ value. This is the noise level, in dBA, exceeded for 90% of the measurement period and is the recognised parameter that represents the *background* noise level.

It can be seen that the lowest daytime $LA_{90}$ value is 40.1dBA (at 23.00hrs) and the lowest nightime $LA_{90}$ value is 35dBA (at 0300hrs).

Since background noise levels in cities either stay constant or increase slightly, due to increased road traffic flows, it is permissible to use the background measurements made in 2010 as the targets for mechanical services noise emission since these represent conservative assessments of environmental noise at nearby properties.

## 6. APPRAISALOF THE NOISE CLIMATE ON SITE

The rear garden of the site is screened from road traffic noise and is quiet. No noise from mechanical plant was noted in the garden.

## 7. NOISE CRITERIA

The impact of noise from mechanical plant to the surrounding neighbourhood is assessed by comparison of the residual noise at the nearest neighbourhood façade with the pre-existing background ($LA_{90}$). This procedure is described in BS4142 (ref 1).

## 8. MECHANICAL SERVICES SERVING THE PROJECT

It is understood that the atmospheric inlet/discharges will be via a service riser to be provided to the rear of the proposed summer house. The summer house will also contain a Mitsubishi PURY- EP350YLM-A1 heat recovery outdoor unit. The unit has a sound power level of 86dBA re $10^{-12}$ watts.

Mitsubishi MXZ-4D83VA inverter heat pumps are to be located on the roof of the building. These have a sound power level of 64dBA re $10^{-12}$ watts.

The nearest residences to the main plant discharges are nos. 44 and 48 Avenue Road which are at a distance of approximately 30m, however the discharge of the heat recovery unit will face to the rear of the shaft in the direction of properties on Elsworthy Road, a distance of approximately 40m.

Because of the directivity effect of the installation it is considered that this will be the most critical noise transfer path.

It is recommended that the target residual noise level from the mechanical plant be limited to approximately 10dBA below the pre-existing background ($LA_{90}$) level. This will mean the use of double bank acoustic louvres fitted to the inlet and discharge of the plant chamber. A possible layout is shown in sketch 1 appended.

Inlet and discharge ducts from air handling units and extract fans within the basement plantroom should be provided with conventional duct mounted attenuators sized to give an emerging sound power level at the atmospheric louvres no higher than 57dBA.

The acoustic louvres should have the following Dynamic Insertion Loss:

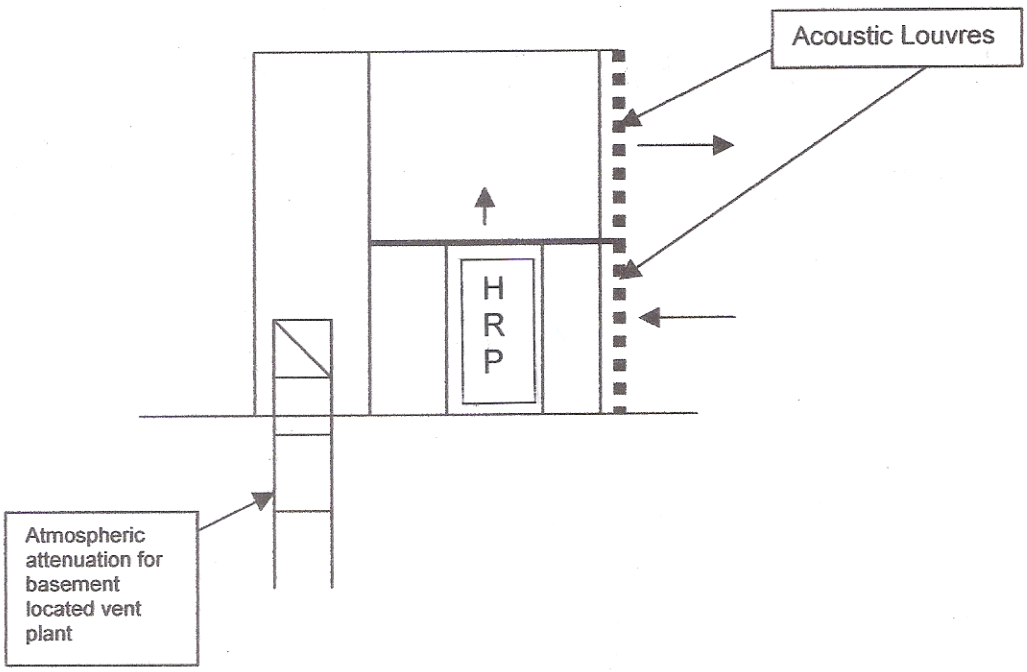
| | Octave Band Hz | | | | | | |
|---|---|---|---|---|---|---|---|
| | 63 | 125 | 250 | 500 | 1k | 2k | 4k |
| D.I.L. dB | 10 | 10 | 13 | 20 | 26 | 28 | 23 |

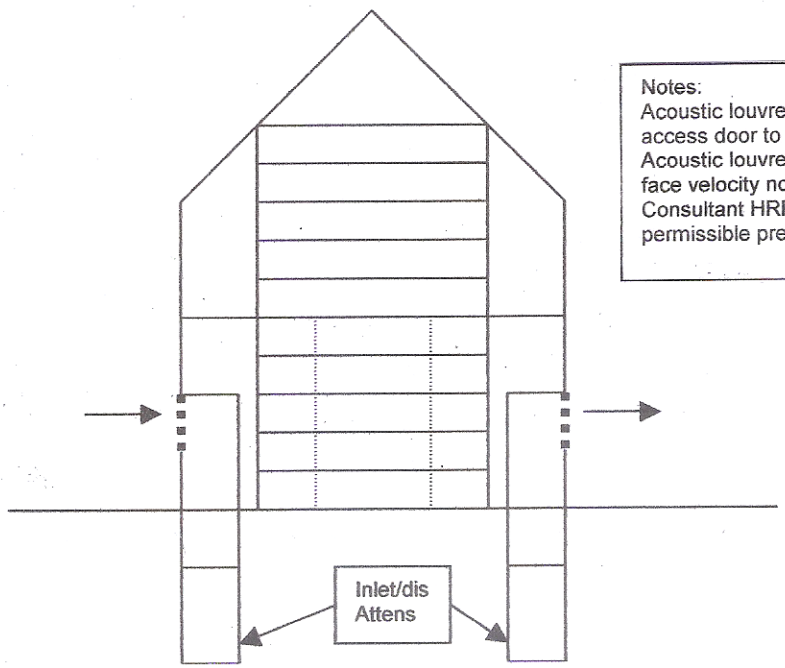
## 9. REFERENCES

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

## Sketch 1

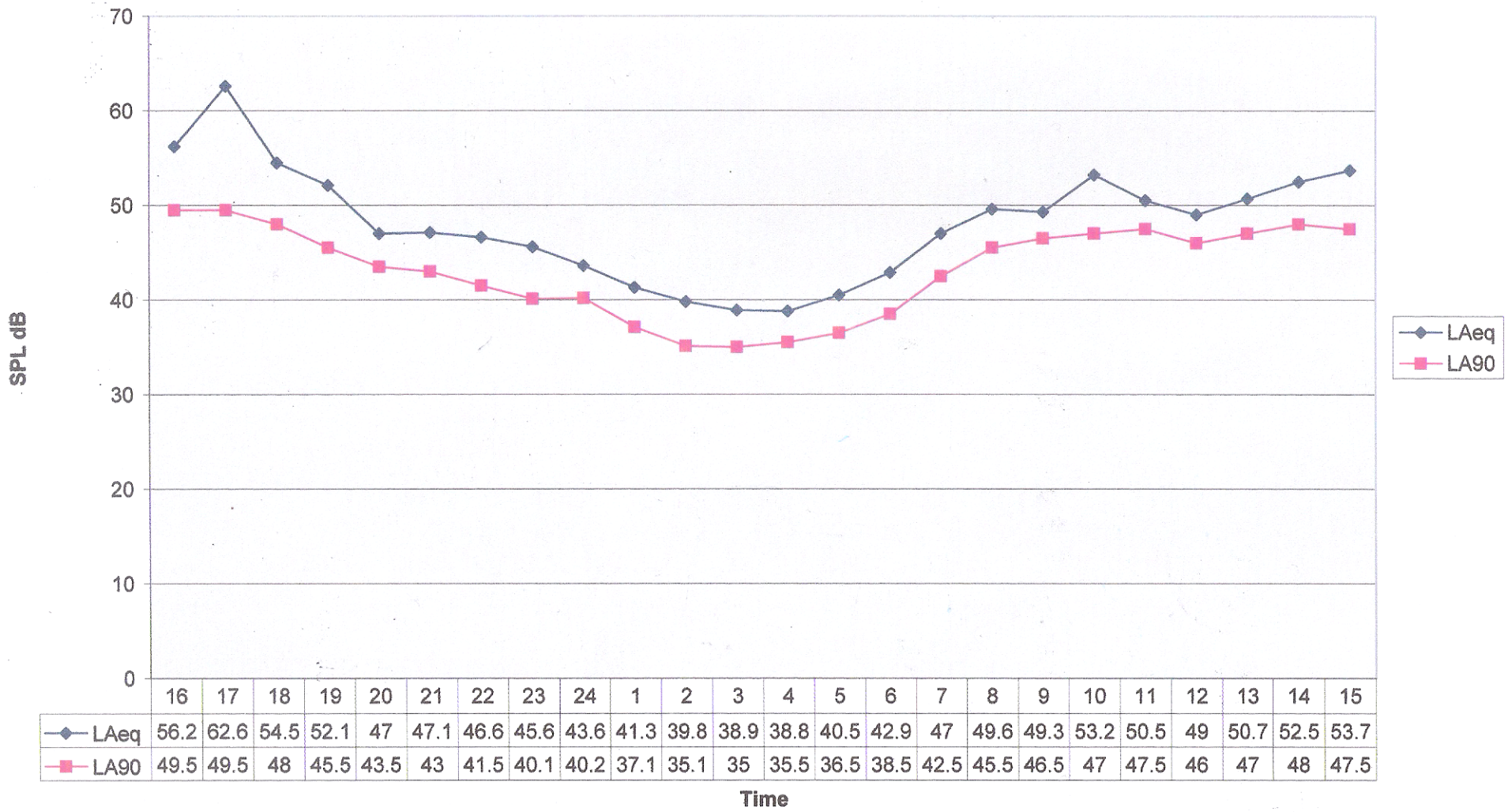
## Possible plant layout




Notes:
Acoustic louvre could be formed as an access door to the HR plant.
Acoustic louvres should be sized for a face velocity no greater than 2m/s.
Consultant HRP manufacturer for permissible pressure losses.

## 46 Avenue Road NW8. Noise level in rear garden




| | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| LAeq | 56.2 | 62.6 | 54.5 | 52.1 | 47 | 47.1 | 46.6 | 45.6 | 43.6 | 41.3 | 39.8 | 38.9 | 38.8 | 40.5 | 42.9 | 47 | 49.6 | 49.3 | 53.2 | 50.5 | 49 | 50.7 | 52.5 | 53.7 |
| LA90 | 49.5 | 49.5 | 48 | 45.5 | 43.5 | 43 | 41.5 | 40.1 | 40.2 | 37.1 | 35.1 | 35 | 35.5 | 36.5 | 38.5 | 42.5 | 45.5 | 46.5 | 47 | 47.5 | 46 | 47 | 48 | 47.5 |