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REPORT TITLE:

Environmental Noise Survey & Environmental Noise Criteria for New Mechanical Services Plant.

PROJECT: 8-10 Hatton Garden, London, EC1N

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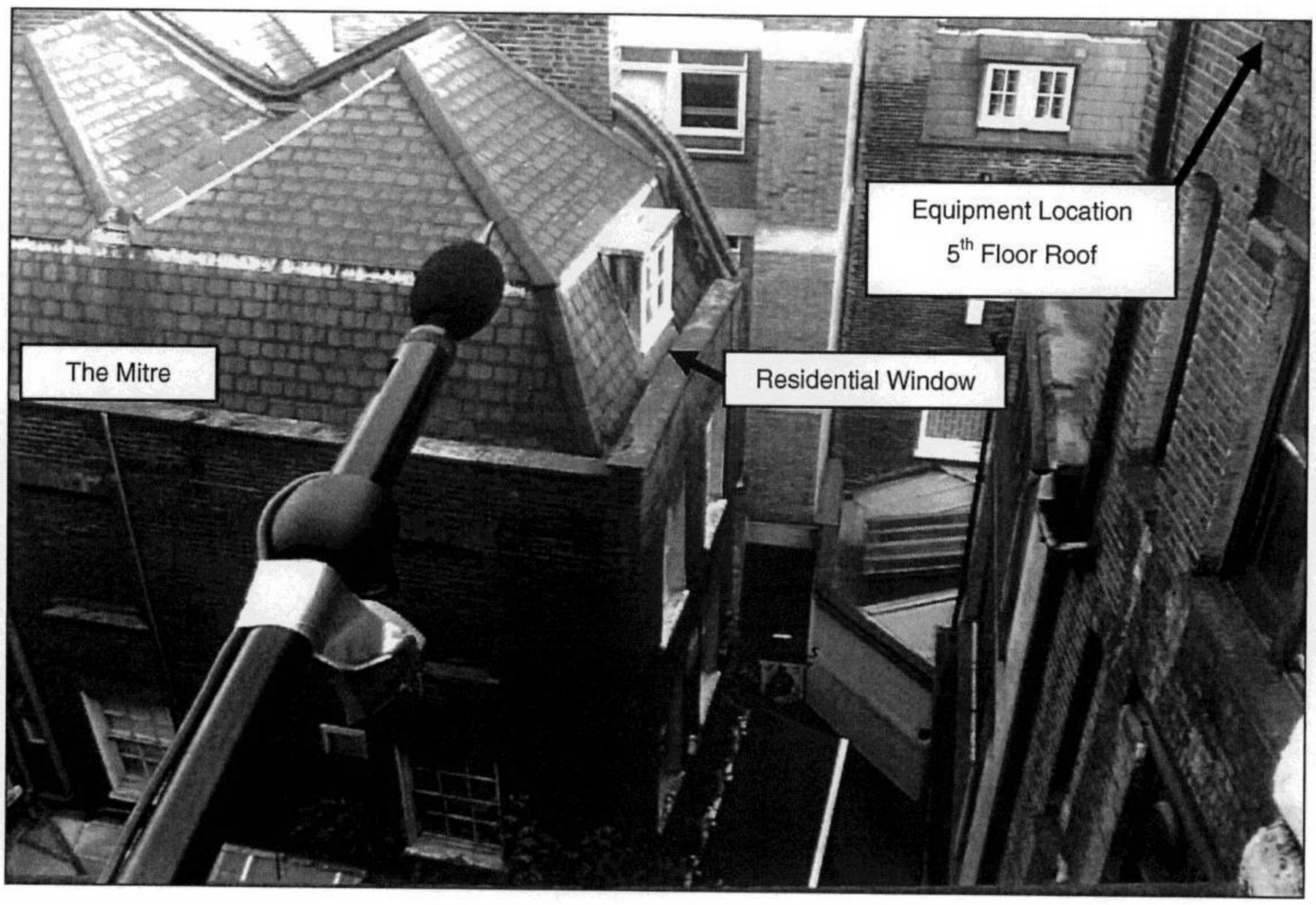
1. Introduction

Pace Acoustic Consulting has been appointed on behalf of Brooksplace PLC to provide a background noise survey at 8-10 Hatton Garden, London, EC1N.

The site is to be refurbished into modern commercial office space and as such new items of ventilation and cooling equipment are to be installed. Cooling units and toilet extract plant is proposed on a flat roof at 5th floor level over the rear of the property and a limiting acoustic specification is required to prevent complaint from any adjacent residential dwellings.

From our site survey, the rear of the property faces mostly commercial property, with the exception of the Mitre public house, which is indicated on the photograph below:



As is indicated, a window at approximately 2nd floor level appears to be of residential nature, as such this location forms the point at which the limiting criteria determined within this report, in accordance with the guidance of L.B Camden Council must be achieved or demonstrated.

2. Survey Method and Equipment

2.1 Measurements

Environmental noise data has been recorded at the rear of the site over the 22nd & 23rd January 2007. The photograph above and Figure 1 located at the rear of this report illustrates the site and our measurement location.

Background (L_{A90}) noise data recorded at the rear of 8-10 Hatton Garden allows the development of limiting noise criteria applicable at the façade of the nearest residential dwelling, taken to be a 2nd floor window within the Mitre public house.

Throughout the survey the following were recorded over 15 minute samples:

- L_{90} – Is the level exceeded for 90% of the total sample time. The L_{90} level is often referred to as the background noise level.
- L_{eq} – Is the equivalent continuous noise level over the sample also referred to as the average or ambient noise level.
- L_{Max} – Is the maximum noise level reached during a sample period.
- Time Weighting – Acoustic parameters such as those above are dependant on the time weighting selected (i.e. Fast, Slow or Instantaneous), which affects the sampling response of the sound level meter.
- dBA (shown as suffix 'A', in parameters above e.g. L_{Aeq}) refers to the A-weighted sound level. The A-weighting is a series of filters applied to the sound level meter to mirror the response of the human ear, which is more sensitive to high frequencies than low.

2.2 Equipment

Norsonic precision grade sound analyser type 118. Serial No.31741.
External microphone Kit type 1212.
Norsonic Calibrator type: 1443.

The sound level meter was calibrated before and after the survey. No drift was noted between the two reference checks, calibrating to exactly 114 dBA.

2.3 Weather

The area was dry and calm over the survey period allowing unaffected background noise measurements to be taken.

3. Acoustic Design Criteria

L.B Camden Council have a standard design policy for new items of mechanical services plant. Plant is to be designed to meet a rating level as expressed within BS 4142: 1997 'Method for rating industrial noise affecting mixed residential and industrial Areas' of 5dBA below the lowest recorded L_{A90} for the period of operation.

Where plant is likely to operate with tonal or intermittent characteristics a further 5dBA penalty should be applied to the lowest background noise level recorded, resulting in a design noise level 10dBA below the L_{A90} for the operational period.

Using the guidance above for the rooftop plant location at the rear of 8-10 Hatton Garden maximum design noise levels have been determined for a range of operational periods.

By providing a range of operational periods, a decision can be taken as to whether the equipment should be de-activated overnight or during the evening, or whether daytime only operation is all that is required. Assessing the background noise condition only for the applicable operational period clearly then offers benefits in terms of requirements for necessary noise control measures as it may not be necessary to design for 24-hour use.

4. Survey Results

The broad band results obtained during the survey are provided at the rear of this document as Appendix 1.

A graphical representation of the continuous monitoring results is also provided at the rear of the report as Figure 2, for information.

4.1 Results Discussion

The area to the rear of 8-10 Hatton Garden is affected by traffic noise on the adjacent Holborn, with which Hatton garden Joins to the south. Noise was also noted from a major construction site, also located on Holborn. The continuous input of distant mechanical services plant was also audible at the measurement location, but is typical of many similar locations in central London.

5. Limiting Plant Noise Specification

L.B Camden Council require new mechanical services plant serving the development to comply with their guidance, which is to achieve a total noise rating level of 5dBA below the lowest measured local background noise level.

As discussed within BS 4142: 1997 'Method for rating industrial noise affecting mixed residential and industrial Areas', should plant operate with tonal or intermittent characteristics a further 5dBA penalty should be applied (this is referred to as an acoustic feature correction).

In this case, prior to equipment selection, should intermittency or tonality be anticipated, the correction of 5dB should be applied to the lowest background noise level recorded for the operational period to determine the total noise emission.

Using the guidance above, the following total design noise levels have been determined for the rear of the site. Limiting Noise criteria are to be achieved at 1 metre from the 2nd Floor window of the Mitre public house (11 metres from the proposed 5th floor roof plant area):

Operation Period	Limiting Specification	With 5dB Correction
07:00-19:00 Hrs	45dB $L_{Aeq, 1\ hour}$	40dB $L_{Aeq, 1\ hour}$
07:00-23:00 Hrs	43.5dB $L_{Aeq, 1\ hour}$	38.5dB $L_{Aeq, 1\ hour}$
24 Hrs	40dB $L_{Aeq, 5\ min}$	35dB $L_{Aeq, 5\ min}$

Note. 5 minute values would be sufficient for assessment at night; this is consistent with the assessment procedure described within BS 4142:1997 "Method for Rating industrial noise affecting mixed residential and industrial areas".

The above design values are to be achieved or demonstrated at 1m from the nearest affected residential window, immediately adjacent to the site.

6. Conclusions

- Pace Acoustic Consulting has undertaken an environmental noise survey to take into account the typical 24-hr background noise levels at the rear of 8-10 Hatton Garden during a typical weekday.

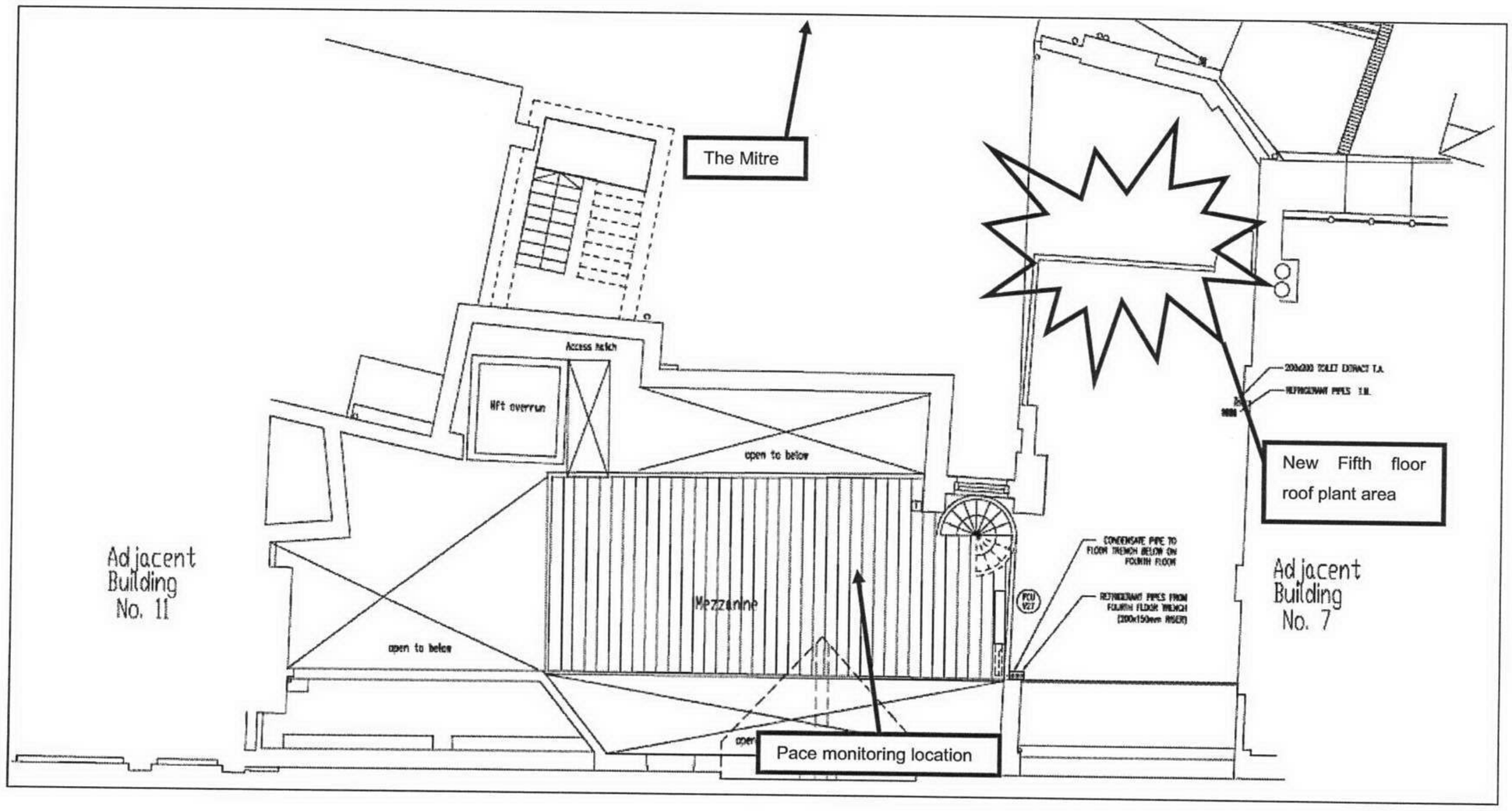
- The site is affected by traffic noise on city routes and items of distant mechanical services equipment serving other buildings in the locality.

- Guidance has been provided regarding the limitation of plant noise from the site in accordance with the requirements of L.B Camden Council. Noise limits provided are to be achieved at 1 metre from the 2nd floor window of the adjacent Mitre public house.

- Assessment and provision of recommendations for plant noise control measures is to follow once selections have been made.

- Plant noise control into the building itself via the roof structure which is likely have a relatively low acoustic performance is an area of design which is not included in our scope. This issue does however require attention during the design of the installation to serve 8-10 Hatton Garden.

Figure 1: Site Plan

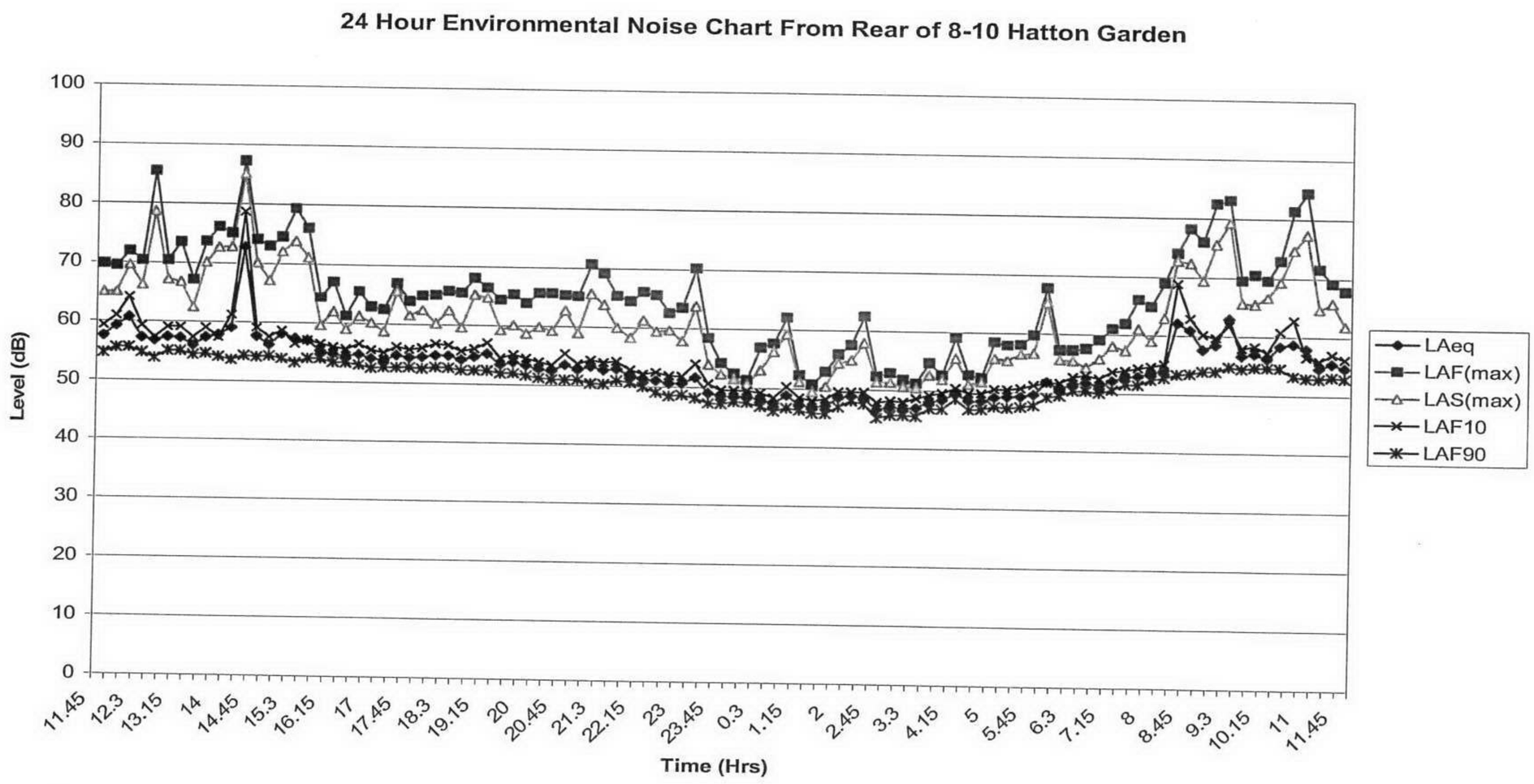


Appendix 1 – Continuous Results from Position 1

Time	LAeq	LAF(max)	LAS(max)	LAF10	LAF90
11.45	57.5	69.8	65.0	59.3	54.6
12.00	59.2	69.5	65.1	60.9	55.5
12.15	60.7	72.0	69.7	64.1	55.6
12.30	57.2	70.4	66.3	59.3	54.7
12.45	56.8	85.5	78.7	57.2	53.8
13.00	57.4	70.5	67.2	59.1	55.0
13.15	57.2	73.5	66.8	59.1	55.0
13.30	56.0	67.2	62.5	57.3	54.4
13.45	57.4	73.7	70.2	59.0	54.6
14.00	57.8	76.2	72.7	57.4	54.1
14.15	59.1	75.2	72.9	61.2	53.6
14.30	72.9	87.3	85.2	78.7	54.3
14.45	57.7	74.1	70.2	59.1	54.1
15.00	56.2	73.0	67.2	57.5	54.3
15.15	58.1	74.6	72.1	58.6	53.9
15.30	57.3	79.4	73.9	56.4	53.2
15.45	57.0	76.1	71.2	57.0	54.0
16.00	55.3	64.4	59.7	56.5	54.0
16.15	54.8	67.1	62.0	56.0	53.4
16.30	54.5	61.3	59.0	55.6	53.3
16.45	54.8	65.5	61.3	56.5	53.0
17.00	54.1	62.9	60.2	55.5	52.5
17.15	53.8	62.5	58.7	55.1	52.6
17.30	54.7	67.0	65.7	56.1	52.6
17.45	54.3	64.0	61.5	55.7	52.7
18.00	54.5	64.9	62.5	56.0	52.5
18.15	54.8	65.1	60.2	56.7	52.8
18.30	54.8	65.8	62.5	56.5	52.7
18.45	54.1	65.5	59.6	55.5	52.3
19.00	54.6	68.1	65.2	56.0	52.3
19.15	55.2	66.5	64.8	57.0	52.3
19.30	53.4	64.4	59.2	54.5	51.9
19.45	53.8	65.4	60.1	55.1	52.0
20.00	53.3	63.9	58.7	54.5	51.6
20.15	52.7	65.7	59.9	53.9	51.2
20.30	52.4	65.7	59.2	53.4	51.0
20.45	53.5	65.4	62.8	55.4	50.9
21.00	52.7	65.2	58.9	53.7	51.0
21.15	53.3	70.7	65.7	54.3	50.4
21.30	52.7	69.2	63.8	54.0	50.3
21.45	52.9	65.4	60.0	54.2	51.0
22.00	51.9	64.5	58.3	52.8	50.6
22.15	51.3	66.1	61.3	52.1	50.0
22.30	51.1	65.6	59.4	52.4	49.1
22.45	50.6	62.6	59.7	51.9	48.5
23.00	50.6	63.5	57.8	51.8	48.7
23.15	51.7	70.3	63.8	54.0	48.2
23.30	49.1	58.4	53.9	50.6	47.4
23.45	48.6	54.2	52.3	49.6	47.3
0.00	48.6	52.4	51.5	49.6	47.7
0.15	48.6	51.4	50.7	49.5	47.6
0.30	48.2	56.9	53.1	49.2	46.9
0.45	47.5	57.7	56.3	48.4	46.2
1.00	48.9	62.1	59.3	50.3	46.8

Time	LAeq	LAF(max)	LAS(max)	LAF10	LAF90
1.15	47.4	52.3	51.2	48.5	46.4
1.30	47.0	50.8	49.6	48.0	45.9
1.45	47.2	53.0	50.5	48.3	45.9
2.00	48.6	56.0	54.5	49.6	47.1
2.15	48.9	57.6	55.0	49.6	48.1
2.30	48.7	62.5	58.0	49.6	47.6
2.45	46.7	52.3	51.4	47.9	45.3
3.00	47.2	52.9	51.4	48.2	45.8
3.15	47.0	51.8	50.7	48.0	45.8
3.30	47.1	51.2	50.5	48.6	45.7
3.45	48.2	54.7	52.7	49.2	47.0
4.00	48.5	52.7	52.0	49.6	46.9
4.15	49.7	59.1	55.6	50.5	48.7
4.30	48.4	52.8	51.2	49.7	46.9
4.45	48.4	52.3	51.7	49.7	47.0
5.00	49.1	58.5	55.7	50.4	47.5
5.15	49.2	58.0	55.4	50.4	47.3
5.30	49.3	58.1	56.5	50.6	47.5
5.45	49.7	59.8	56.6	51.2	47.8
6.00	51.8	67.9	65.4	51.6	49.2
6.15	50.7	57.3	55.7	51.7	49.5
6.30	51.6	57.3	55.5	52.7	50.4
6.45	51.8	57.6	54.4	53.0	50.4
7.00	51.4	59.1	55.9	52.5	50.1
7.15	52.2	61.1	58.1	53.7	50.6
7.30	52.9	62.0	57.4	53.9	51.6
7.45	53.0	66.1	61.1	54.3	51.5
8.00	53.6	64.9	59.0	54.6	52.4
8.15	54.1	69.0	63.0	55.1	52.8
8.30	62.2	74.1	72.9	68.9	53.4
8.45	61.0	78.3	72.4	62.9	53.5
9.00	57.7	76.1	69.5	60.2	54.0
9.15	58.5	82.6	75.7	59.7	54.0
9.30	63.0	83.2	79.4	61.8	54.8
9.45	56.7	69.6	65.7	57.9	54.5
10.00	57.1	70.6	65.5	58.3	54.7
10.15	56.3	69.6	66.7	57.2	54.7
10.30	58.4	73.0	69.4	60.8	54.6
10.45	58.8	81.5	74.8	62.8	53.3
11.00	58.0	84.5	77.5	56.5	53.0
11.15	54.7	71.7	64.8	55.9	52.9
11.30	55.5	69.2	65.8	57.0	53.2
11.45	54.8	67.9	61.9	56.2	53.0

Figure 2:


24 Hour Environmental Noise Chart From Rear of 8-10 Hatton Garden
Level (dB)
100
90
80
70
60
50
40
30
20
10
0
11.45
12.3
13.15
14
14.45
15.3
16.15
17
17.45
18.3
19.15
20
20.45
21.3
22.15
23
23.45
0.3
1.15
2
2.45
3.3
4.15
5
5.45
6.3
7.15
8
8.45
9.3
10.15
11
11.45
Time (Hrs)
LAeq
LAF(max)
LAS(max)
LAF10
LAF90