



## CHAPTER COURT, WREXHAM

### Environmental Noise Survey

Reference: 9928.RP01.ENS.0  
Prepared: 12 February 2020  
Revision Number: 0

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# Environmental Noise Survey



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|          |                       |                  |              |               |
|          |                       |                  |              |               |
|          |                       |                  |              |               |

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The recommendations within this report relate to acoustics performance only and will need to be integrated within the overall design by the lead designer to incorporate all other design disciplines such as fire, structural integrity, setting-out, etc. Similarly, any sketches appended to this report illustrate acoustic principles only and again will need to be developed in to full working drawings by the lead designer to incorporate all other design disciplines.

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## 1.0 INTRODUCTION

There is a proposal to develop the existing service yard at Chapter Court, Wrexham, to an external retail and food court area.

RBA Acoustics has been commissioned to undertake measurements of the prevailing noise conditions at the site and to provide the design criteria in line with the requirements of Wrexham County Council. This report presents the results of the noise measurements and associated setting of criteria.

## 2.0 ENVIRONMENTAL NOISE SURVEY

### 2.1 General

Monitoring of the prevailing background noise was undertaken over the following period:

Thursday 9 January to Monday 13 January 2020

As the survey was unattended it is not possible to comment with certainty regarding meteorological conditions throughout the entire survey period, however the weather was generally considered satisfactory it being predominantly dry with little wind.

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

To determine the existing noise climate around the site measurements were taken at first floor roof level of the Enterprise Hub, Wrexham, overlooking the service yard. The microphone was mounted on a pole 2m above roof level, and more than 3 m away from any other significant reflecting surface. The measurement position is also illustrated on the Site Plan in Figure 1.

The prevailing noise climate was noted to mainly consist of activities within the service yard, and noise from the nearby town centre.

### 2.3 Instrumentation

Details of the instrumentation used to undertake the survey are provided in Appendix B.

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

### 3.0 RESULTS

The noise levels measured are shown as time-histories on the attached Graphs 1 and 2. Typical  $L_{A90}$  levels and the period averaged  $L_{Aeq}$  noise levels measured are summarised in Table 1.

Table 1 – Measured Levels

| Measurement Period       | Parameter | Sound Level (dB) at Octave Band Centre Frequency (Hz) |     |     |     |    |    |    |    | Overall (dBA) |
|--------------------------|-----------|-------------------------------------------------------|-----|-----|-----|----|----|----|----|---------------|
|                          |           | 63                                                    | 125 | 250 | 500 | 1k | 2k | 4k | 8k |               |
| Daytime (07:00–19:00)    | $L_{eq}$  | 54                                                    | 49  | 46  | 43  | 45 | 43 | 38 | 29 | 50            |
|                          | $L_{90}$  | 42                                                    | 40  | 34  | 32  | 32 | 23 | 12 | 12 | 35            |
| Night-time (23:00–07:00) | $L_{eq}$  | 51                                                    | 45  | 42  | 39  | 37 | 38 | 32 | 23 | 44            |
|                          | $L_{90}$  | 37                                                    | 35  | 31  | 27  | 25 | 18 | 10 | 10 | 30            |

### 4.0 CONSTRUCTION NOISE CRITERIA

The requirements of Wrexham County Councils Environment and Planning Department regarding construction noise are as follows.

*“Operational hours should be limited. We usually suggest 07:30 to 18:00 Monday to Friday, 08:00 to 14:00 Saturday with no work on Sundays and Bank Holidays.*

- *All equipment should meet EU noise emission standards*
- *Reducing noise from very noisy activities should be considered in detail. E.g. hydraulic or auger piling should be used rather than percussive piling*
- *All equipment should be silenced, and acoustic screens erected where possible*
- *Neighbours should be advised well in advance of any particularly noisy activities. For bigger projects more formal liaison arrangements should be made to ensure effective communication with the local community.*

*Site practices should meet BS 5228 which provides guidance on noise control on construction sites.”*

BS 5228: 2009 Code of Practice for Noise and Vibration Control on Construction and Open Sites suggests several ways to control noise from construction. The most appropriate measures for this development will need to be determined in due course dependent on the proposed construction techniques and programme.

## 5.0 ENTERTAINMENT NOISE CRITERIA

Planning condition ZP06-01 within the memorandum P/2020/0007 state the requirements of Wrexham County Councils Environmental Health Department regarding music noise:

*“No part of the development shall commence until a scheme of noise insulation and attenuation measures has been submitted to approved in writing by the Local Planning Authority. The measures as are approved shall be fully implemented in strict accordance with the scheme prior to first use of the development and shall thereafter be retained as such.*

*The scheme shall have regard to the following:*

- 1. The noise climate of the surrounding area shall be protected such that the A-weighted equivalent continuous noise level (LAeq) emanating from the application site, as measured 1 metre from any façade of any noise sensitive premises over any 5 minute period with entertainment taking place shall not increase by more than 3dB as compared to the same measure from the same position, and over a comparable period, with no entertainment noise taking place.*
- 2. The unweighted equivalent noise level (Leq) in the 63Hz octave band, measured using the ‘fast’ time constant, inside any living room of any noise sensitive premises, with the windows open or closed, over any 5 minute period with entertainment taking place, shall show no increase as compared to the same measure, from the same location, and over a comparable period, with no entertainment taking place.*
- 3. No sound emanating from the establishment should be audible within any noise sensitive premises between 23:00 and 07:00 hours.”*

## 6.0 PLANT NOISE CRITERIA

Planning condition ZP06-01 within the memorandum P/2020/0007 state the requirements of Wrexham County Councils Environmental Health Department regarding air handling/extraction plant is as follows:

*“The rating level of any noise generated by air handling plant associated with the development shall not exceed background level by more than 5dB(A) at any time. The noise levels shall be determined at nearby noise sensitive premises, and measurements and assessment shall be made in accordance with BS4142:2014 Methods for rating and assessing industrial and commercial sound.”*

## 7.0 CRITERIA SUMMARY

In line with the Local Authority criteria set out in Sections 4.0 – 6.0, the following noise limits are proposed for the development for operational noise.

Table 2 – Plant Noise Criteria

| Measurement Period         | LAeq (dBA) at 1m from any Noise Sensitive Premises |
|----------------------------|----------------------------------------------------|
| Daytime (07:00 – 19:00)    | 40                                                 |
| Night-time (23:00 – 07:00) | 35                                                 |

Table 3 – Entertainment Noise Criteria

| Measurement Period         | L <sub>Aeq</sub> (dBA) at 1m from any Noise Sensitive Premises | L <sub>Aeq</sub> (dBA) at 1m from any Noise Sensitive Premises at 63Hz |
|----------------------------|----------------------------------------------------------------|------------------------------------------------------------------------|
| Daytime (07:00 – 19:00)    | 35                                                             | 32                                                                     |
| Night-time (23:00 – 07:00) | 20                                                             | -                                                                      |

The Daytime overall criterion has been proposed so as not to increase background level by more than 3dB, as required by the Local Authority.

As it was not possible to measure the background noise levels within the nearby residential premises, the 63Hz criteria is proposed so that entertainment noise at this band is inaudible outside any noise sensitive premises. This will ensure there is no increase in background level within the noise sensitive premises.

In terms of the night-time entertainment noise criteria, planning condition ZP06-01 states no entertainment noise should be audible within any noise sensitive premises at night-time. In line with this, a noise limit of 10dB below background at 1m away from any noise sensitive premises is proposed, which should ensure any entertainment noise is inaudible outside the premises, and therefore would be inaudible inside the premises.

In terms of construction noise criteria, best practicable means should be used to ensure there is as little disturbance as possible to local community. It is advised to seek regular contact with the adjacent occupiers in order to keep them updated with current progress on site, works which may affect them in the near future and how long these works are likely to take. Liaison with the council is also recommended. The most appropriate measures for construction noise control at this development will need to be determined in due course.

## 8.0 CONCLUSION

Measurements of the existing background noise levels at Chapter Court, Wrexham have been undertaken. The results of the measurements have been used in order to determine operational and construction noise limits for the development in accordance with the requirements of Wrexham County Council.

# 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 - Instrumentation

The following equipment was used for the measurements

| Manufacturer                      | Model Type | Serial No. | Calibration     |              |
|-----------------------------------|------------|------------|-----------------|--------------|
|                                   |            |            | Certificate No. | Expiry Date  |
| Norsonic Type 1 Sound Level Meter | Nor140     | 1406007    | U28864          | 26 June 2020 |
| Norsonic Pre Amplifier            | 1209       | 20043      |                 |              |
| Norsonic ½" Microphone            | 1225       | 208146     | 28863           | 26 June 2020 |
| Norsonic Sound Calibrator         | 1251       | 34127      | U28862          | 26 June 2020 |

## Appendix C – Graphs and Site Plans

Chapter Court, Wrexham

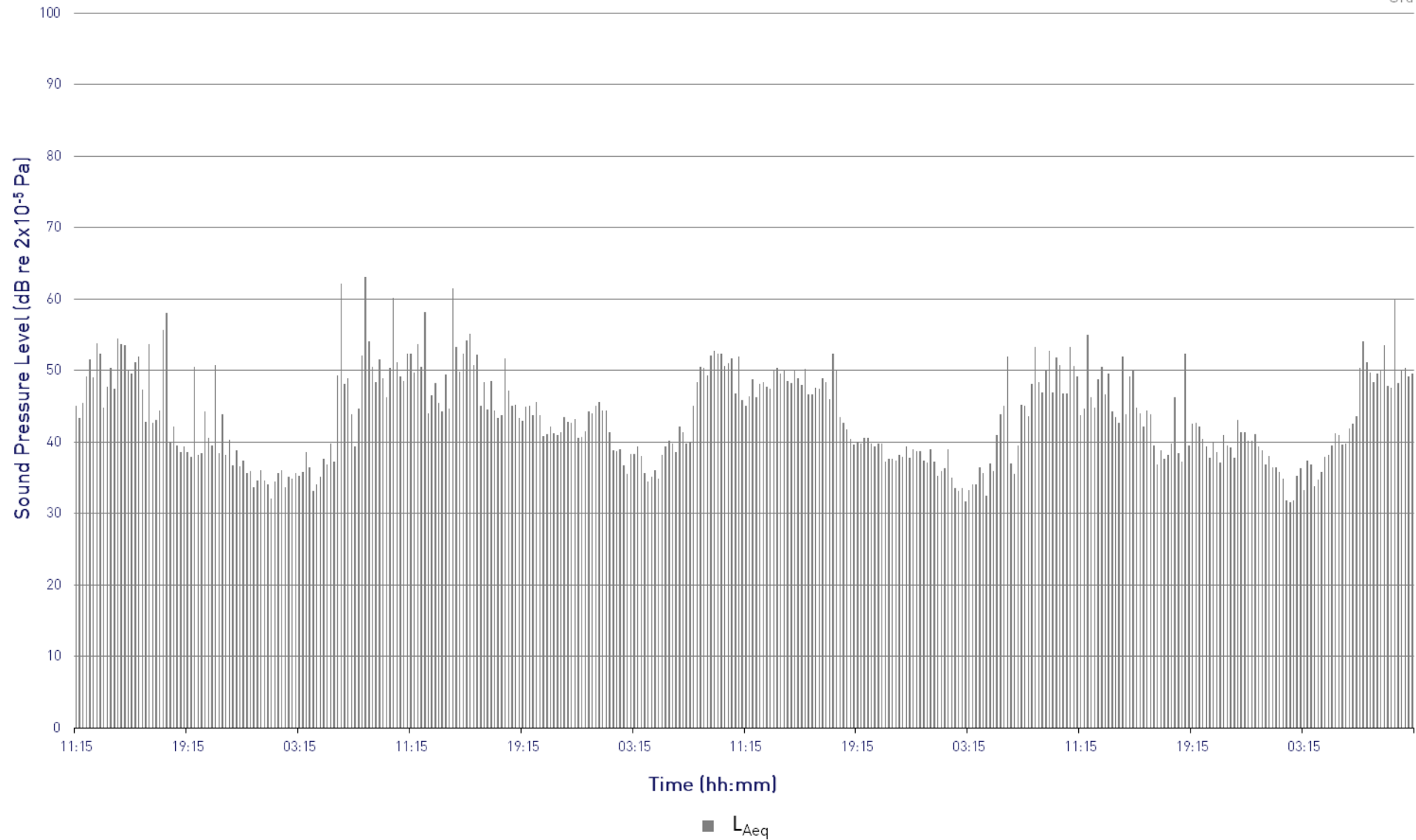
$L_{Aeq}$  Time History

Thursday 9th January to Monday 13th January 2020



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Graph 1



Chapter Court, Wrexham

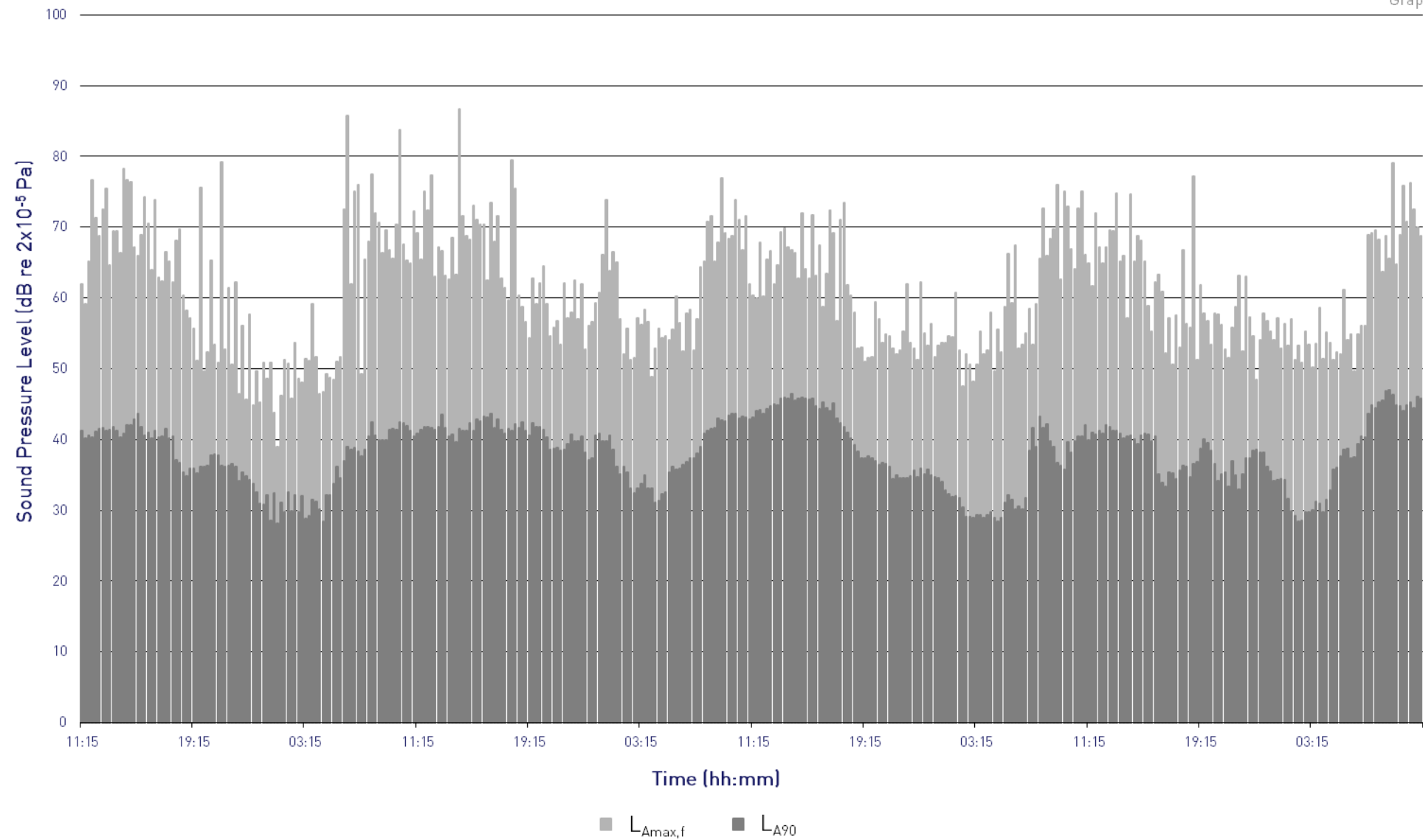
$L_{Amax,f}$  and  $L_{A90}$  Time History

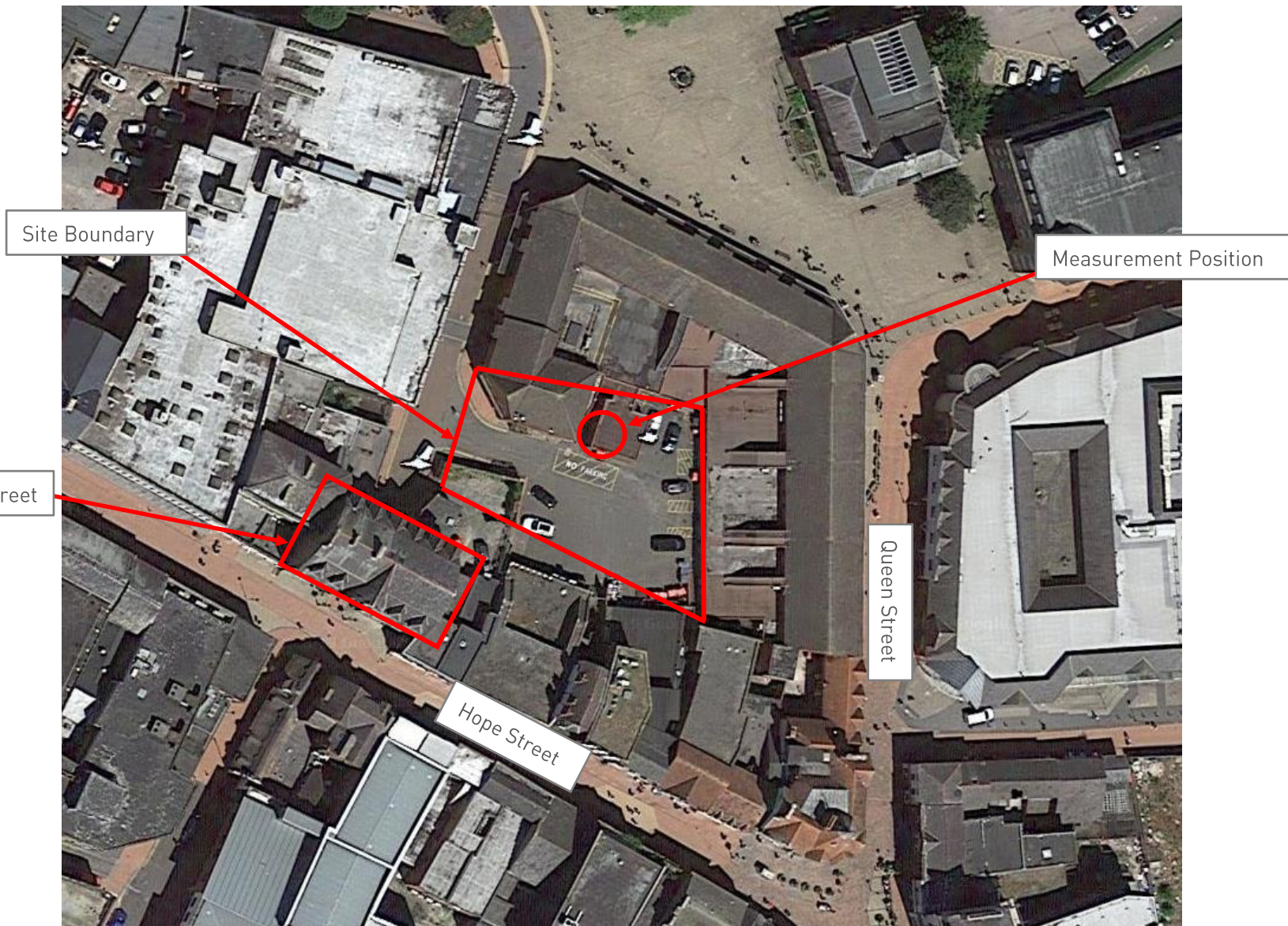
Thursday 9th January to Monday 13th January 2020



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Graph 2





Chapter Court, Wrexham  
Site Plan  
Project 9928

Figure 1  
12 February 2020  
Not to Scale

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