

Project: 34 St Mary's Butts, Reading, RG1 2LS
Client: Bluebird Design Services

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1 Introduction

It is proposed that the existing premises located at 34 St Mary's Butts, Reading, RG1 2LS, be redeveloped to provide new residential apartments at first and second floor levels.

This impact assessment covers the environmental noise considerations associated with the development in the context of national and local planning policy and guidance. This report should be read in conjunction with any other accompanying documents, plans and technical studies as appropriate.

The assessment contained within this report is based upon the principles and recommendations contained within the following documents:

- National Planning Policy Framework;
- National Policy Statement for England;
- National Planning Practice Guidance, Noise;
- BS8233: 2014: Guidance on sound insulation and noise reduction for buildings;
- World Health Organisation, Guidelines for Community Noise, 1999;
- BS 7445-2:1991, Description and measurement of environmental noise. Guide to the acquisition of data pertinent to land use.

As part of this assessment, the sound insulation requirements of the external fabric of the building will be quantified in the context of policy requirements normally set out by the local planning authority Reading Borough Council (RBC).

2 Site Description

The site is located at 34 St Mary's Butts, Reading, RG1 2LS, lying in an area that contains a mix of residential, commercial and retail premises. The building extends to three storeys in height and is currently given over to commercial usage

The site location is illustrated below.

Figure 1: Site location



3 Planning Policy Context

3.1 National Planning Policy Framework 2019

The [NPPF](#) sets out the Government's planning policies for England and how these should be applied. It provides a framework within which locally prepared plans for housing and other development can be produced.

There are a number of paragraphs in the NPPF that directly mention noise.

Paragraph 170 states that planning policies and decisions should contribute to and enhance the natural and local environment by:

- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability

Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life¹;
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

Paragraph 182 requires that:

“Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.”

3.2 Noise Policy Statement for England 2010

The Noise Policy Statement for England (NPSE) sets out the long-term vision of Government noise policy, which is to:

“Promote good health and a good quality of life through the management of noise within the context of Government policy on sustainable development”.

This long term vision is supported by the following aims:

¹ See Explanatory Note to the Noise Policy Statement for England (Department for Environment, Food & Rural Affairs, 2010).

"Through the effective management of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- avoid significant adverse impacts on health and quality of life;*
- mitigate and minimise adverse impacts on health and quality; and*
- where possible, contribute to the improvement of health and quality of life."*

When discussing the meaning of "significant adverse" and "adverse", within an Explanatory Note the NPSE states:

"There are two established concepts from toxicology that are currently being applied to noise impacts for example, by the World Health Organisation. They are

NOEL – No Observed Effect Level - This is the level below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

LOAEL – Lowest Observed Adverse Effect Level - This is the level above which adverse effects on health and quality of life can be detected."

For the purposes of the NPSE, the Government added the following related concept:

"SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant adverse effects on health and quality of life occur."

It is also noted that it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different sources, for different receptors and at different times.

3.3 National Planning Practice Guidance 2014

The National Planning Practice Guidance (NPPG) was published as an online resource in 2014. It includes guidance on how to recognise when noise could be a concern in planning decisions and includes advice that the planning process should be used to "avoid" significant observed adverse effects occurring, by use of appropriate mitigation such as altering design and layout.

The NPPG also states that the planning process should be used to "prevent" unacceptable adverse effects where noise is noticeable and very disruptive leading to extensive and regular changes in behaviour and/or an inability to mitigate the effect of noise leading to psychological stress or physiological effects.

The NPPG provides a summary table setting out the noise exposure hierarchy based on the likely average response, reproduced below.

Perception	Examples of outcomes	Increasing effect level	Action
Not noticeable	No effect	No observed effect	No specific measures required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No observed adverse effect	No specific measures required
<i>Lowest Observed Adverse Effect Level</i>			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed adverse effect	Mitigate and reduce to a minimum
<i>Significant Observed Adverse Effect Level</i>			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant observed adverse effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

4 Guidance on the Assessment of Noise

4.1 BS 8233:2014: Guidance on sound insulation and noise reduction for buildings

This British Standard came into effect on 28 February 2014 and supersedes BS 8233:1999, which is withdrawn.

The standard draws on the results of research and experience to provide information on the design of buildings that have internal acoustic environments appropriate to their functions. It deals with control of noise from outside the building, noise from plant and services within it, and room acoustics for non-critical situations. It is applicable to the design of new buildings, or refurbished buildings undergoing a change of use, but does not provide guidance on assessing the effects of changes in the external noise levels to occupants of an existing building.

Indoor ambient noise levels for dwellings are set out at Section 7.7.2, Table 4, reproduced below.

Table 1: Indoor ambient noise levels for dwellings (source: BS 8233:2014, Table 4)

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	—
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	—
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

A series of notes provide context to the guideline values of Table 4. Note 1 advises that the indoor ambient noise levels are “the sum total of structure-borne and airborne noise sources. Groundborne noise is assessed separately and is not included as part of these targets, as human response to groundborne noise varies with many factors such as level, character, timing, occupant expectation and sensitivity.”

Note 3 states “These levels are based on annual average data and do not have to be achieved in all circumstances. For example, it is normal to exclude occasional events, such as fireworks night or New Year’s Eve.”

Note 4 deals with individual events and advises that “Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values”.

Note 5 states that if relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation arrangement that does not compromise the façade insulation or the resulting noise level.

Note 7 provides a rider to the guideline values of Table 4, “Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved”.

4.2 World Health Organisation

The recommended indoor ambient noise levels given at Table 4 of BS 8233:2014 do not included a specified value for noise events. Although not explicitly covered in the pre-

application advice, it is considered prudent to make an allowance for night noise events as it is often that case this will dictate facade sound insulation requirements for bedrooms.

Guidance on event noise is given in the World Health Organisation (WHO) Guidelines for Community Noise, as below.

The WHO document provided a review of the effects of noise and a description of the principles of health criteria.

Table 1 of the document presents guideline values arranged according to specific environments and critical health effects. Noise indices to be adopted and the accompanying time base to be used for the assessment are also presented.

The guideline values consider all health effects for a specific environment. An adverse health effect refers to any temporary or long-term impairment of physical, psychological or social functioning associated with noise exposure. The specific noise limits were set for each health "using the lowest noise level that produces an adverse health effect"

Table 2: Guideline values for community noise (source: WHO Guidelines for Community Noise Table 1)

Specific environment	Critical health effect(s)	L_{Aeq} [dB]	Time base [hours]	L_{Amax} fast [dB]
Dwelling, indoors	Speech intelligibility & moderate annoyance daytime & evening	35	16	45
	Sleep disturbance, night time	30	8	

For noise events, the guideline value was set at 45 dB L_{Amax} , with research cited in the text advising that this value should not be exceeded by more than 10 to 15 times per night to ensure "good sleep".

4.3 Reading Borough Council

Based on experience of other comparable local projects, the local planning authority is likely to impose the following requirements:

"No development shall take place until a detailed scheme, informed by an assessment of the current noise environment, for protecting the dwellings from the external noise environment of the area has been submitted to and approved, in writing, by the Local Planning Authority. The scheme itself shall be designed, specified and constructed so that the sound insulation performance of the structure and the layout of the dwellings are such that the indoor ambient noise levels do not exceed the values detailed in Table 4 of BS 8233:2014. Where opening windows will lead to an internal noise level increase of 5 dBA or greater above BS 8233:2014 recommended internal levels, the scheme shall include provision of alternative mechanical ventilation with minimum performance equivalent to a mechanical heat recovery (MVHR) system with cool air bypass as an alternative means of cooling and ventilation. Noise from the system should not result in BS8233 internal levels being exceeded. Thereafter, the development shall not be carried out other than in accordance with the approved scheme which shall be completed before any part of the accommodation hereby approved is occupied, unless the Local Planning Authority otherwise agrees in writing (prior to commencement of development)."

5 Environmental Noise Surveys

5.1 Method

Detailed surveys have been carried out at site to determine the extant noise climate at the site. Measurements were made at the locations described below and illustrated by Figure 3.

- **MP1:** 34 St Mary's Butts, east (front) elevation, first floor level, 1m from facade;
- **MP2:** 34 St Mary's Butts, west (rear) elevation, second floor level, 1m from facade.

Figure 2: Measurement locations



The noise data at all positions are facade values due to the contribution from reflected sound from surfaces other than the ground plane.

Surveys were made over the following periods, using continuous, consecutive 5-minute measurement periods between approximately 12:30 hours on the 08 September 2020 to 12:30 hours on 10 September 2020.

Sound pressure level measurements were obtained using the following instrumentation complying with the Type 1 specification of BS EN 60804, BS EN 60651, BS EN 60942, BS EN 61260, and BS EN 61672-1:

The following instrumentation and equipment was used during the survey:

Table 3: Schedule of instrumentation

Type	Serial Number	Calibration Certificate	Calibration Due Date
SVANTEK SVAN 971 sound level meter	56213	14011217-2	23-11-2020
SVANTEK SV18 preamplifier	57308		
ACO microphone 7025E	65483		
SVANTEK SV33A acoustic calibrator	58011		
SVANTEK weather protection kit	n/a	n/a	n/a
SVANTEK SVAN 971 sound level meter	52614	14010484	28-09-2020
SVANTEK SV18 preamplifier	57317		
ACO microphone 7025E	70751		
SVANTEK weather protection kit	n/a		

Field calibration checks were made using a calibrator meeting Class 1 of IEC 60942 at the beginning and end of the measurement session. No significant drift was encountered (0.2 dB), calibration level 114.0 dB $\pm$ 0.2dB @ 1000 Hz $\pm$ 0.2%.

5.2 Results

Noise survey results are summarised in Table 5 and shown as a time series in Figures 3 and 4 below. Broadband results are given over to Appendix A. For brevity, spectral data is available upon request

Figure 3: MP1 Environmental noise time series (façade values in dB re: 20 μ Pa)

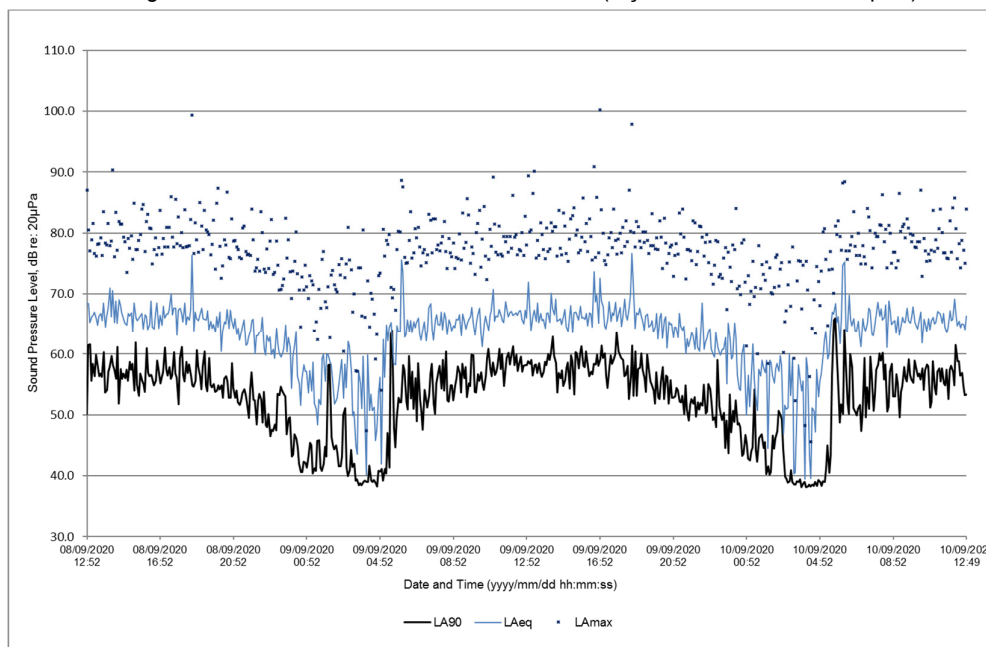


Figure 4: MP2 Environmental noise time series (façade values in dB re: 20µPa)

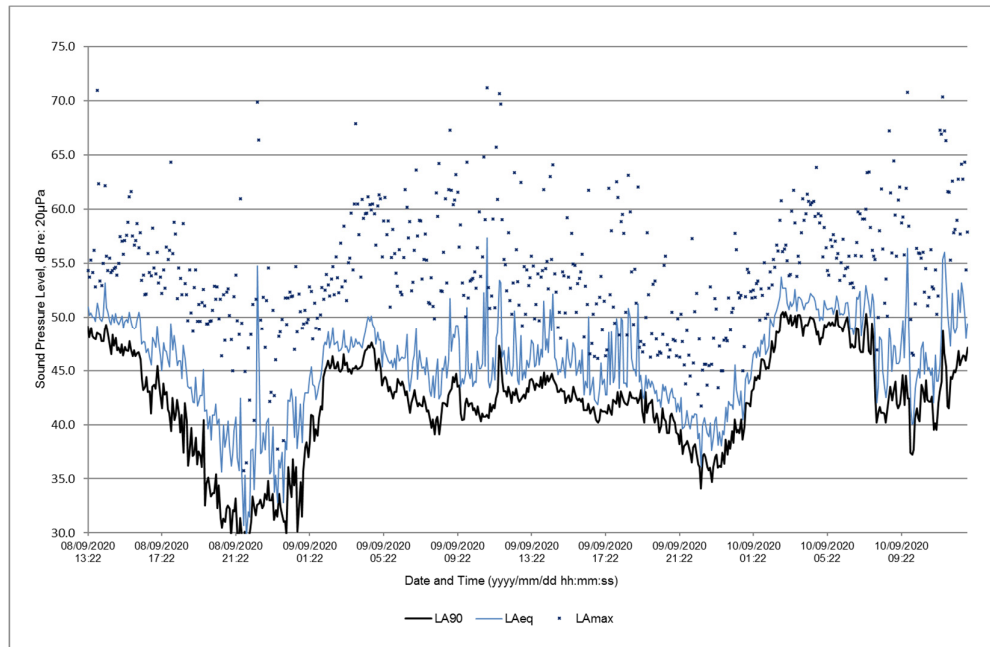


Table 4: Summary of measurement results (façade values in dB re: 20µPa)

Measurement Position	Start Date	Day (07:00 - 23:00)		Night (23:00 - 07:00)			
		$L_{Aeq,16h}$	Minimum $L_{AF90\%}$	$L_{Aeq,8h}$	Minimum $L_{AF90\%}$	Modal L_{AFmax}	10 th Highest L_{AFmax}
MP1	08/09/2020	66 dB	47 dB	62 dB	38 dB	78 dB	85 dB
	09/09/2020	67 dB	48 dB	63 dB	38 dB	77 dB	86 dB
	10/09/2020	66 dB	47 dB	n/a			
MP2	08/09/2020	47 dB	38 dB	46 dB	30 dB	52 dB	60 dB
	09/09/2020	46 dB	34 dB	49 dB	35 dB	53 dB	60 dB
	10/09/2020	49 dB	37 dB	n/a			

6 External Building Fabric Assessment

The assessment detailed herein has been based on the information and assumptions detailed in the following sections, in conjunction with the noise data illustrated above. The determination of facade sound insulation requirements has been undertaken in accordance with equation G.1 of Section G.2.1 of BS 8233:2014, where:

$$L_{eq,2} = L_{eq,ff} + 10 \lg \left(\frac{A_0}{S} 10^{\frac{-D_{n,e}}{10}} + \frac{S_{wi}}{S} 10^{\frac{-R_{wi}}{10}} + \frac{S_{ew}}{S} 10^{\frac{-R_{ew}}{10}} + \frac{S_{rr}}{S} 10^{\frac{-R_{rr}}{10}} \right) + 10 \lg \left(\frac{S}{A} \right) + 3$$

- $L_{eq,ff}$ is the equivalent continuous sound pressure level outside the room element under consideration. It is the free-field sound level, measured or calculated, at the **intended** position of the element under consideration;
- A_0 is a reference absorption area of 10m² and is independent of frequency;
- S_f is the total facade area of the room in question in square metres (m²);
- S_{wi} is the area in square metres (m²) of the windows of the room;
- S_{ew} is the area in square metres (m²) of the external wall of the room;
- S_{rr} is the area in square metres (m²) of the ceiling of the room;
- S is the total area of elements through which sound enters the room in square metres (m²), i.e. $S_f + S_{rr}$;
- $D_{n,e}$ is the insulation of the ventilator measured according to BS EN 20140-10;
- R_{wi} is the sound reduction index of the window;
- R_{ew} is the sound reduction index of the external wall;
- R_{rr} is the sound reduction index of the roof;
- A is the equivalent absorption area of the receiving room.

The foregoing expression is also considered to be appropriate to the assessment of transient noise in the context of the metric L_{Fmax} .

6.1 Room Surface Finishes

It has been assumed that living rooms will be fitted out with hard floor coverings and other soft furnishings and bedrooms will be fitted out with soft floor coverings and other soft furnishings.

6.2 External Walls

The build-up of external walls is not presently known, but the outer leaf comprises solid brickwork of (minimum) thickness 100mm of nominal surface mass 160 kg/m². The sound insulation performance of this build-up has been determined using Insul v7.0.13 thus:

Table 5: Required sound insulation performance of brick faced external walls

Element	Sound reduction index (<i>R</i>) dB at 1/1 octave band centre frequency (Hz)							BS EN ISO 717-1 Rating <i>R_w</i> (<i>C</i> ; <i>C_{tr}</i>) dB
	63	125	250	500	1k0	2k0	4k0	
Solid brick external wall	35	37	34	39	46	55	60	44 (0;-3)

6.3 Glazing Specification

Assuming achievement of the sound insulation values identified above, fenestration shall be required to achieve the random incidence sound reduction indices given in Table 7. The performance specifications apply to the glazing units as a whole inclusive of glazing, sealing, framing, doors, spandrel panels, etc.

Table 6: Glazing sound insulation requirements

Facade	Space	Sound reduction index (<i>R</i>) dB at 1/1 octave band centre frequency (Hz)							ISO 717-1 Rating <i>R_w</i> (<i>C</i> ; <i>C_{tr}</i>) dB
		63	125	250	500	1k0	2k0	4k0	
East (front)	Kit/Liv/Din	21	26	27	37	47	45	53	40 (-2;-6)
	Bed	24	26	33	38	45	46	58	42 (-1;-5)
West (rear)	Kit/Liv/Din	14	23	16	25	37	41	36	30 (-1;-3)
South (side)	Bed	14	23	16	25	37	41	36	30 (-1;-3)

Based on published data obtained from proprietary manufacturers such as Pilkington and Saint-Gobain Solaglass, the forms of glazing set out below should be capable in principle of achieving the sound insulation performance values detailed in Table 7, subject to appropriate specification and detailing of frames, supports etc. It should however be noted that Table 7 forms the specification to be achieved and the glazing configurations detailed below are for **guidance** purposes.

Table 7: Indicative Glazing Selections

Facade	Space	Potential glazing configuration
East (front)	Kit/Liv/Din	SGG 6(16)8.4A double glazed unit
	Bed	SGG 10(15)8.8A double glazed unit
West (rear)	Kit/Liv/Din	SGG 4(16)4 double glazed unit
South (side)	Bed	SGG 4(16)4 double glazed unit

As the design criteria to be achieved are broadband single figure quantities, variation in the spectral sound reduction indices of Table 6 is technically possible, subject to prior approval from the acoustic consultant.

The relevant specialist trade contractors shall provide test data to demonstrate that the performance values of the glazed systems (including opening window lights, framing elements and infill panels as applicable) identified in Table 3 will be achieved.

Tests shall be carried out in accordance with BS EN ISO 10140 Parts 1, 2, 4 and 5:2010 (Acoustics-Laboratory measurement of sound insulation of building elements – Part 1: Application rules for specific products. Part 2: Measurement of airborne sound insulation. Part 4: Measurement procedures and requirements. Part 5: Requirements for test facilities and equipment) or an equivalent series of standards.

Single number quantities for sound insulation shall be derived in accordance with BS EN ISO 717-1: 1997 Acoustics – Rating of sound insulation in buildings and of building elements Part 1: Airborne sound insulation and should include relevant spectrum adaptation terms.

It should be noted that that identical sound insulation is obtained irrespective of which way round insulating units are installed. Thus, for example a 6/12/6.4pvb unit gives the same performance as a 6.4pvb/12/6 unit.

Over the usual cavity width range of 6 to 20mm for insulating units, there is little variation in acoustic performance although there is a more significant change in thermal insulation. This acoustic performance plateau is due to the relatively strong coupling of the component glasses.

It is understood that the glazing units to be installed throughout the residential areas are to be openable, and therefore the window lights must be suitably designed to ensure that the sound insulation potential of the glazing is not undermined.

7 Ventilation

7.1 Front Elevation (East)

Based on RBC pre-application guidance and the applicable measurement data reported above, ventilation to east facing spaces will need to be of an MVHR type system. A potential ventilation system could comprise an SAV Systems AirMaster AM 150² decentralized heat recovery arrangement.

Manufacturer's literature states that:

- “(1) The bypass damper opens automatically. This diverts a portion of the incoming air around the counter flow heat exchanger, decreasing the temperature of the inlet supply air. No manual intervention or unit stoppage is required to adjust the bypass damper position.*
- (2) If the bypass damper reaches 100% open without regaining set point temperature (because of external temperature being high), fan speed is then increased to 100% of design throughput. This happens regardless of demand control requirements, which may call for less than 100% flow. The increased air flow enhances the convective cooling effect felt by occupants.*
- (3) The cooling module is activated (if there is one). If the automatic bypass function has not been sufficient to bring inlet temperature down, effective inlet temperature reduction can be achieved by a cooling module. Cooling modules work on similar principles to those used in a domestic fridge and are designed to deal with fresh air thermal load. They are designed to match the shape of the AirMaster heat recovery ventilation units that they are paired with. They fit between the unit back surface and mounting wall, with side panels which conceal the join to the heat recovery ventilation unit.*

Sequential operation of bypass damper, then fan, then cooling module, ensures that the most energy efficiency is given priority. Put another way, the sequence is designed to hold off action by the cooling module as long as possible, as energy is required to power the compressor.

In addition, there is a further cooling mechanism termed night cooling.

- (4) Night cooling. This takes advantage of the low temperatures available at night time during periods of summer heat waves. AirMaster ventilation units are programmed to start automatically, during the night following any day when external temperature has reached 26°C. Night air cools down the thermal mass of the room, so that air coming into contact with the same surfaces early the following day would be itself cooled”*

² <https://www.sav-systems.com/product-groups/wall-mounted-air-handling-units/#downloadform>

7.2 Rear and Side Elevations (West and South)

As noted above, the pre-application guidance requires that:

“...Where opening windows will lead to an internal noise level increase of 5 dBA or greater above BS 8233:2014 recommended internal levels, the scheme shall include provision of alternative mechanical ventilation with minimum performance equivalent to a mechanical heat recovery (MVHR) system...”

WHO guidance notes that a partially open window will provide an outdoor to indoor reduction of 15 dB(A). Based on the worst-case rear elevation measurement results set out in Section 4.2, the following internal noise levels are calculated and compared with the RBC pre-application requirement.

Table 8: Predicted indoor ambient noise levels with windows open
vs RBC pre-application ventilation guidance

Day ($L_{Aeq,16h}$)			Night ($L_{Aeq,8h}$)			Night (L_{AFmax} 10 th highest)		
Target	Predicted	Compliant	Target	Predicted	Compliant	Target	Predicted	Compliant
40 dB	32 dB	Yes	35 dB	33 dB	Yes	50 dB	45 dB	Yes

It can be seen from Table 8 that indoor ambient noise levels with windows partially open for ventilation should meet the applicable pre-application guidance and hence a passive ventilation strategy may be adopted for the rear façade of the scheme.

8 Conclusions

A detailed review of facade sound insulation requirements has been carried in respect of 34 St Mary's Butts, Reading, RG1 2LS. It is concluded that subject to adoption of the recommendations set out herein, external noise ingress should be controlled to values as per the guidance set out in BS 8233:2014 and hence adequate residential amenity should in principle prevail.

This is therefore in accordance with the principles of clause 170 of NPPF which requires that the proposal should *"mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life"*.

Sufficient information is also considered to be presented herein to satisfy the requirements of Reading Borough Council.

Appendix A: Measurement Data

MP1

Start Time	LAF(max)	LAeq	LA90
12:52	87.0	68.4	50.1
12:57	80.5	68.4	61.5
13:02	77.1	65.3	61.6
13:07	78.9	66.2	55.6
13:12	81.5	66.5	58.4
13:17	76.6	67.0	56.3
13:22	76.2	65.9	59.9
13:27	78.1	64.8	58.5
13:32	78.2	66.3	56.3
13:37	79.3	66.8	56.8
13:42	76.4	65.6	56.2
13:47	83.6	68.5	60.3
13:52	78.3	64.6	53.7
13:57	78.0	66.4	54.1
14:02	81.5	67.6	57.1
14:07	77.9	71.0	57.9
14:12	78.7	66.3	59.7
14:17	90.4	70.5	58.2
14:22	76.1	65.3	57.5
14:27	83.4	68.8	55.9
14:32	77.2	65.2	61.2
14:37	81.9	69.1	51.9
14:42	81.4	68.2	57.5
14:47	81.4	66.9	55.9
14:52	79.3	65.8	56.8
14:57	78.6	65.2	56.0
15:02	73.6	64.8	57.4
15:07	79.2	66.8	55.6
15:12	77.6	66.4	58.7
15:17	79.5	66.9	57.4
15:22	75.7	63.8	58.4
15:27	84.9	68.5	54.0
15:32	77.3	66.0	61.9
15:37	77.2	65.6	55.0
15:42	78.8	66.0	53.1
15:47	79.8	66.4	56.8
15:52	83.9	66.8	55.6

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Start Time	LAF(max)	LAeq	LA90
15:57	84.7	64.2	55.1
16:02	76.9	66.6	53.8
16:07	81.9	66.2	61.0
16:12	83.1	64.1	57.0
16:17	80.8	65.0	56.3
16:22	80.7	68.8	56.6
16:27	75.0	64.6	55.7
16:32	77.3	64.2	54.9
16:37	79.2	66.8	55.6
16:42	76.5	68.5	58.9
16:47	77.6	64.4	57.5
16:52	83.7	66.5	55.2
16:57	76.5	64.9	56.1
17:02	79.1	68.0	57.0
17:07	77.7	66.1	61.1
17:12	80.9	66.7	57.5
17:17	77.7	66.7	56.5
17:22	81.0	67.5	57.9
17:27	86.0	70.0	55.9
17:32	79.3	66.6	56.5
17:37	77.8	67.7	60.3
17:42	85.6	67.6	56.8
17:47	78.2	63.2	56.1
17:52	82.7	67.3	51.7
17:57	77.9	67.6	59.3
18:02	80.1	66.8	61.2
18:07	77.6	65.4	56.6
18:12	83.8	68.5	55.5
18:17	77.7	65.0	58.7
18:22	77.9	66.3	56.9
18:27	77.9	65.7	58.3
18:32	82.2	67.5	56.5
18:37	99.3	76.3	54.9
18:42	76.7	63.9	54.6
18:47	81.7	67.0	55.6
18:52	78.9	65.9	60.6
18:57	76.8	65.6	58.0
19:02	85.1	66.4	56.4
19:07	81.1	67.7	54.2
19:12	77.3	66.0	58.0
19:17	83.7	65.8	60.4

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Client: Bluebird Design Services

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Start Time	LAF(max)	LAeq	LA90
19:22	80.5	65.8	54.8
19:27	80.2	67.2	53.9
19:32	79.8	64.1	59.4
19:37	76.4	65.6	55.0
19:42	78.1	64.3	54.5
19:47	82.1	65.0	55.1
19:52	74.1	63.7	53.8
19:57	84.9	66.2	54.0
20:02	87.3	64.6	54.8
20:07	77.8	67.0	54.2
20:12	72.6	60.5	54.9
20:17	74.7	63.8	52.8
20:22	78.9	65.4	55.9
20:27	78.0	65.1	56.3
20:32	86.7	67.5	55.5
20:37	76.0	64.3	52.8
20:42	75.8	67.3	52.8
20:47	82.3	65.6	58.5
20:52	78.7	64.3	54.4
20:57	78.8	66.0	52.8
21:02	77.7	63.3	54.0
21:07	77.3	64.3	52.1
21:12	76.0	62.3	51.6
21:17	75.7	63.8	52.4
21:22	80.8	64.7	53.6
21:27	81.1	65.8	54.2
21:32	77.0	61.5	53.4
21:37	76.5	61.6	52.0
21:42	76.5	62.9	49.5
21:47	76.3	63.9	54.2
21:52	83.9	65.6	57.0
21:57	78.9	65.9	52.5
22:02	73.7	60.1	52.4
22:07	74.3	63.0	48.4
22:12	75.7	63.1	52.3
22:17	73.8	63.7	53.5
22:22	83.5	63.8	52.5
22:27	80.1	66.2	48.7
22:32	74.1	60.9	53.8
22:37	73.5	59.8	48.3
22:42	77.4	63.0	48.0

Project: 34 St Mary's Butts, Reading, RG1 2LS
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Start Time	LAF(max)	LAeq	LA90
22:47	74.2	62.1	50.1
22:52	78.7	62.8	46.5
23:02	73.2	60.8	47.4
23:07	73.5	59.3	48.4
23:12	78.7	64.4	47.5
23:17	74.7	61.7	53.5
23:22	70.6	60.1	53.2
23:27	70.8	59.5	54.6
23:32	71.4	60.1	54.0
23:37	72.5	61.0	53.4
23:42	82.4	64.9	53.0
23:47	75.9	60.3	46.8
23:52	79.0	62.7	49.4
23:57	73.7	61.1	49.6
00:02	69.2	54.4	43.2
00:07	73.8	59.6	43.5
00:12	75.4	61.7	46.8
00:17	80.2	63.8	46.1
00:22	73.3	56.4	44.7
00:27	70.6	55.1	42.0
00:32	64.5	51.6	40.6
00:37	72.8	55.9	40.6
00:42	70.7	58.3	42.3
00:47	74.8	57.1	42.1
00:52	71.2	57.2	41.4
00:57	69.3	53.6	42.7
01:02	73.0	57.2	45.4
01:07	72.2	54.0	45.0
01:12	71.5	58.6	40.4
01:17	63.9	51.9	41.2
01:22	65.4	51.0	40.8
01:27	62.4	48.4	45.7
01:32	70.8	52.5	45.9
01:37	67.7	51.7	41.4
01:42	75.6	59.3	40.8
01:47	77.0	59.9	42.0
01:52	68.8	55.5	44.8
01:57	67.7	59.9	43.2
02:02	71.2	60.0	58.2
02:07	62.7	58.8	58.3
02:12	73.1	58.3	46.4

Project: 34 St Mary's Butts, Reading, RG1 2LS
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Date: 11/09/2020
Reference: 20200911_4703_ENA01.docx

Start Time	LAF(max)	LAeq	LA90
02:17	73.9	55.9	45.1
02:22	71.6	51.8	44.3
02:27	70.8	52.2	45.0
02:32	70.4	52.8	43.7
02:37	74.8	55.3	41.6
02:42	73.1	57.1	41.6
02:47	75.8	59.1	43.2
02:52	60.4	52.8	50.0
02:57	72.7	58.3	51.1
03:02	74.9	54.4	41.5
03:07	80.9	62.1	40.0
03:12	75.6	61.3	40.9
03:17	74.0	57.2	44.2
03:22	67.0	49.8	41.5
03:27	70.1	50.5	42.0
03:32	57.3	44.8	39.2
03:37	57.2	43.6	39.4
03:42	74.3	57.3	38.5
03:47	74.3	55.1	38.8
03:52	66.4	51.1	38.5
03:57	80.6	59.6	39.0
04:02	66.2	48.7	39.2
04:07	47.4	40.1	39.0
04:12	72.2	59.8	39.0
04:17	64.5	50.7	41.7
04:22	70.2	53.4	39.2
04:27	69.2	50.8	39.0
04:32	66.7	51.3	39.3
04:37	59.2	45.8	38.8
04:42	63.3	47.5	38.2
04:47	73.0	53.9	40.8
04:52	73.4	56.1	40.7
04:57	54.0	42.0	41.1
05:02	80.7	62.4	39.2
05:07	76.2	56.2	41.1
05:12	78.8	64.9	40.4
05:17	78.2	62.2	47.0
05:22	79.7	64.4	41.4
05:27	71.1	65.3	63.2
05:32	69.4	62.0	64.0
05:37	70.8	58.4	47.8

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Start Time	LAF(max)	LAeq	LA90
05:42	67.3	58.2	44.7
05:47	77.3	64.7	49.3
05:52	80.3	63.8	52.8
05:57	80.2	63.8	52.1
06:02	88.6	75.6	52.1
06:07	87.6	73.6	58.2
06:12	76.0	62.8	57.3
06:17	75.1	63.2	52.2
06:22	75.2	65.8	50.9
06:27	78.8	63.8	59.7
06:32	83.5	65.6	52.7
06:37	75.9	63.5	57.1
06:42	76.8	65.4	51.0
06:47	80.7	64.5	56.0
06:52	79.2	65.3	49.0
06:57	81.0	66.1	58.5
07:02	77.8	63.3	52.5
07:07	74.6	62.3	50.6
07:12	76.8	64.3	47.6
07:17	77.3	65.4	54.1
07:22	75.1	62.2	52.7
07:27	76.4	64.1	51.2
07:32	83.0	67.8	53.2
07:37	82.1	68.5	56.8
07:42	76.8	64.2	58.4
07:47	82.3	62.3	51.9
07:52	82.4	65.8	50.1
07:57	77.3	66.6	55.2
08:02	78.1	65.0	57.0
08:07	77.1	64.9	58.1
08:12	78.4	67.0	54.3
08:17	79.5	64.1	59.0
08:22	81.9	66.9	54.0
08:27	77.0	65.9	60.4
08:32	74.2	63.2	52.4
08:37	79.1	65.7	52.2
08:42	76.8	65.1	54.8
08:47	76.1	63.9	54.9
08:52	78.4	64.7	52.4
08:57	74.2	64.4	54.9
09:02	76.0	65.8	56.0

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Start Time	LAF(max)	LAeq	LA90
09:07	75.8	65.8	58.0
09:12	79.9	66.6	56.9
09:17	75.5	63.1	53.7
09:22	83.3	66.7	58.4
09:27	77.6	65.8	56.0
09:32	78.5	64.2	57.8
09:37	85.6	65.1	52.9
09:42	83.0	65.7	55.2
09:47	75.1	66.2	54.7
09:52	77.7	67.8	59.9
09:57	76.6	65.4	59.8
10:02	73.3	63.1	53.8
10:07	80.1	65.0	53.7
10:12	81.6	66.5	56.7
10:17	83.8	67.7	55.6
10:22	74.4	63.6	57.0
10:27	79.0	61.2	55.1
10:32	84.4	64.9	54.1
10:37	76.3	66.3	56.3
10:42	72.3	65.3	59.4
10:47	75.7	64.0	60.9
10:52	80.7	66.4	57.6
10:57	77.9	67.3	56.4
11:02	89.1	70.7	58.6
11:07	81.5	65.5	56.6
11:12	76.8	66.4	57.0
11:17	76.5	66.3	58.1
11:22	81.2	67.4	60.8
11:27	76.5	66.5	57.5
11:32	76.2	65.6	60.0
11:37	79.5	65.3	54.7
11:42	78.6	68.7	57.1
11:47	79.4	67.5	59.4
11:52	76.8	66.3	60.2
11:57	79.4	67.0	58.3
12:02	77.5	67.1	59.6
12:07	86.2	66.5	61.3
12:12	79.3	66.7	58.2
12:17	79.8	67.0	59.9
12:22	76.5	66.4	57.2
12:27	77.3	67.2	58.3

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Client: Bluebird Design Services

Date: 11/09/2020
Reference: 20200911_4703_ENA01.docx

Start Time	LAF(max)	LAeq	LA90
12:32	77.1	67.3	59.6
12:37	80.1	65.9	57.1
12:42	76.3	65.0	58.1
12:47	82.7	67.4	58.2
12:52	78.1	66.0	58.2
12:57	89.4	72.0	58.8
13:02	80.2	67.7	58.4
13:07	80.5	64.0	59.0
13:12	86.5	66.4	56.5
13:17	90.1	67.4	58.2
13:22	75.9	65.5	58.3
13:27	78.8	68.5	56.9
13:32	76.4	65.3	58.5
13:37	81.7	66.8	57.1
13:42	79.7	65.6	56.2
13:47	77.3	65.9	57.1
13:52	75.8	64.4	58.7
13:57	80.9	66.8	58.2
14:02	77.0	66.9	60.0
14:07	77.4	65.3	59.0
14:12	81.7	70.1	60.1
14:17	80.3	67.7	62.9
14:22	81.1	66.6	59.7
14:27	81.1	69.2	58.5
14:32	76.2	65.5	53.7
14:37	83.7	65.8	56.9
14:42	77.5	65.9	56.0
14:47	76.4	65.0	57.3
14:52	83.3	66.4	54.7
14:57	81.2	67.4	55.7
15:02	76.7	64.7	57.7
15:07	75.4	63.8	58.6
15:12	79.0	66.1	54.3
15:17	82.3	68.1	59.8
15:22	82.8	63.6	58.8
15:27	84.2	67.0	53.4
15:32	79.7	67.0	60.3
15:37	80.5	66.3	60.1
15:42	76.7	65.7	57.6
15:47	77.2	67.9	60.1
15:52	79.4	66.1	61.3

Project: 34 St Mary's Butts, Reading, RG1 2LS
Client: Bluebird Design Services

Date: 11/09/2020
Reference: 20200911_4703_ENA01.docx

Start Time	LAF(max)	LAeq	LA90
15:57	85.8	66.2	58.1
16:02	78.6	65.8	57.9
16:07	81.6	66.8	60.4
16:12	76.9	64.8	58.0
16:17	82.4	66.9	56.3
16:22	79.5	66.7	57.1
16:27	75.5	64.6	56.7
16:32	91.0	73.7	58.4
16:37	76.0	68.7	58.3
16:42	85.8	69.8	59.9
16:47	76.8	65.2	58.1
16:52	100.2	72.6	59.1
16:57	83.8	68.9	61.4
17:02	79.9	67.9	59.4
17:07	75.5	64.7	60.1
17:12	74.8	64.2	56.3
17:17	76.5	65.9	54.4
17:22	79.3	68.7	57.8
17:27	80.1	65.5	59.8
17:32	77.7	66.9	58.4
17:37	84.0	66.5	59.2
17:42	78.8	68.6	60.0
17:47	76.6	65.5	63.6
17:52	79.0	66.5	60.4
17:57	79.9	67.8	59.9
18:02	76.8	64.6	59.3
18:07	80.9	66.2	59.0
18:12	77.8	69.2	56.3
18:17	82.1	66.5	56.6
18:22	78.6	65.7	58.1
18:27	87.1	67.9	52.6
18:32	80.3	70.2	56.4
18:37	97.9	76.7	61.4
18:42	80.1	69.5	53.1
18:47	77.7	64.4	60.4
18:52	81.9	66.9	53.1
18:57	81.1	66.6	57.5
19:02	78.7	67.7	57.7
19:07	77.6	66.6	60.1
19:12	80.2	65.3	57.4
19:17	78.5	64.0	56.0

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Client: Bluebird Design Services

Date: 11/09/2020
Reference: 20200911_4703_ENA01.docx

Start Time	LAF(max)	LAeq	LA90
19:22	80.2	66.4	53.8
19:27	78.8	66.7	59.9
19:32	76.7	64.5	57.1
19:37	78.0	64.9	55.5
19:42	83.2	65.6	55.0
19:47	77.9	63.7	54.0
19:52	77.4	64.6	51.9
19:57	79.3	66.8	57.0
20:02	77.3	62.5	52.9
20:07	82.0	66.1	52.6
20:12	79.4	66.8	55.4
20:17	74.2	62.6	57.9
20:22	82.5	65.7	52.6
20:27	78.3	66.3	56.5
20:32	75.0	61.1	56.2
20:37	76.6	65.4	51.9
20:42	77.7	64.9	55.7
20:47	78.0	65.1	52.8
20:52	73.0	62.8	52.8
20:57	76.3	64.6	53.0
21:02	78.3	64.5	54.4
21:07	76.5	62.8	54.1
21:12	83.3	66.8	52.2
21:17	79.9	64.6	52.1
21:22	83.9	64.0	53.1
21:27	79.3	64.6	50.1
21:32	72.5	60.1	54.9
21:37	77.3	62.5	50.9
21:42	77.3	61.2	49.1
21:47	77.1	62.6	51.6
21:52	75.5	63.6	52.6
21:57	82.0	63.0	51.9
22:02	81.7	60.8	52.9
22:07	74.8	64.5	49.7
22:12	76.9	61.2	52.1
22:17	81.2	60.5	50.9
22:22	81.0	63.9	52.0
22:27	79.3	68.5	51.5
22:32	76.2	60.8	55.0
22:37	78.5	62.0	50.2
22:42	79.8	62.5	50.6

Project: 34 St Mary's Butts, Reading, RG1 2LS
Client: Bluebird Design Services

Date: 11/09/2020
Reference: 20200911_4703_ENA01.docx

Start Time	LAF(max)	LAeq	LA90
22:47	75.1	63.9	55.1
22:52	78.5	64.2	54.2
22:57	73.2	60.8	51.8
23:02	71.6	59.9	49.2
23:07	74.7	59.5	49.6
23:12	78.8	63.6	48.0
23:17	78.6	61.1	59.0
23:22	72.8	60.3	51.4
23:27	73.2	59.9	50.1
23:32	72.6	60.8	49.2
23:37	75.9	60.8	50.3
23:42	77.6	62.8	44.6
23:47	67.4	55.1	49.1
23:52	76.9	65.2	43.7
23:57	74.4	62.4	53.3
00:02	72.0	59.2	47.1
00:07	78.0	59.6	50.7
00:12	77.2	65.2	48.9
00:17	84.1	62.6	52.4
00:22	70.9	56.6	48.4
00:27	71.3	54.3	48.6
00:32	69.9	54.0	48.0
00:37	78.3	60.0	43.3
00:42	78.9	61.6	43.6
00:47	71.9	55.9	46.7
00:52	61.4	50.0	45.3
00:57	73.1	56.5	42.8
01:02	68.3	51.4	42.5
01:07	70.4	55.2	44.0
01:12	75.3	61.6	44.7
01:17	69.5	56.0	54.2
01:22	71.1	53.3	44.2
01:27	60.0	50.7	42.3
01:32	77.9	57.5	46.2
01:37	70.9	56.4	46.5
01:42	74.8	59.0	46.8
01:47	73.2	57.9	44.6
01:52	72.3	57.0	45.5
01:57	75.3	58.9	40.3
02:02	58.4	44.6	41.6
02:07	74.3	58.9	40.2

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Client: Bluebird Design Services

Date: 11/09/2020
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Start Time	LAF(max)	LAeq	LA90
02:12	70.2	58.5	40.6
02:17	70.0	56.5	46.6
02:22	71.1	55.2	44.5
02:27	76.1	57.6	46.2
02:32	76.5	58.4	47.4
02:37	71.3	57.2	50.7
02:42	74.1	59.8	49.9
02:47	75.1	58.1	49.3
02:52	60.2	46.9	44.5
02:57	65.5	51.6	39.8
03:02	67.2	50.9	39.5
03:07	71.5	51.1	38.9
03:12	75.3	60.0	39.1
03:17	68.0	53.2	40.9
03:22	77.7	59.3	39.0
03:27	59.3	40.4	38.6
03:32	52.4	40.6	38.6
03:37	72.1	52.1	39.1
03:42	75.4	58.3	39.0
03:47	75.3	55.5	39.4
03:52	67.6	54.0	38.1
03:57	74.8	55.6	38.8
04:02	48.3	39.5	39.0
04:07	75.4	59.4	38.1
04:12	70.7	57.6	38.2
04:17	56.3	43.3	38.6
04:22	45.6	39.6	38.2
04:27	64.3	51.1	38.6
04:32	69.0	50.6	38.4
04:37	63.5	47.2	39.0
04:42	74.5	57.5	38.4
04:47	72.1	53.0	39.3
04:52	68.1	55.7	39.0
04:57	73.7	56.8	38.4
05:02	80.2	59.9	39.1
05:07	80.8	62.4	39.0
05:12	75.6	63.8	41.2
05:17	64.7	59.1	45.0
05:22	74.0	59.9	40.5
05:27	77.0	63.9	43.5
05:32	74.1	67.0	56.4

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Start Time	LAF(max)	LAeq	LA90
05:37	70.2	66.7	65.7
05:42	81.2	68.4	66.0
05:47	79.8	65.3	60.8
05:52	82.0	66.3	53.9
05:57	79.4	61.7	48.7
06:02	77.2	66.1	51.7
06:07	88.2	74.7	50.1
06:12	88.4	75.3	64.1
06:17	77.1	64.0	59.0
06:22	75.7	63.7	52.1
06:27	77.1	69.8	50.1
06:32	78.0	65.8	60.0
06:37	79.4	64.8	57.9
06:42	83.5	65.9	51.1
06:47	77.8	63.9	50.5
06:52	76.3	63.8	49.9
06:57	80.0	65.5	51.0
07:02	76.3	62.9	51.6
07:07	74.9	61.3	47.3
07:12	77.9	65.9	50.5
07:17	76.1	64.4	59.4
07:22	75.0	63.9	49.6
07:27	84.0	65.2	54.5
07:32	82.6	67.7	51.0
07:37	80.4	67.3	59.6
07:42	74.3	63.2	56.6
07:47	77.5	63.1	50.7
07:52	80.0	65.4	53.4
07:57	79.4	67.1	57.4
08:02	79.4	68.6	58.3
08:07	81.4	66.4	60.1
08:12	81.2	67.6	58.9
08:17	86.3	65.7	60.2
08:22	78.6	66.1	55.8
08:27	80.6	68.2	58.3
08:32	74.3	61.1	50.6
08:37	81.3	68.9	51.4
08:42	80.0	67.1	57.1
08:47	75.0	65.0	58.4
08:52	76.9	65.4	53.0
08:57	76.9	65.6	53.0

Project: 34 St Mary's Butts, Reading, RG1 2LS
Client: Bluebird Design Services

Date: 11/09/2020
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Start Time	LAF(max)	LAeq	LA90
09:02	74.3	63.5	56.7
09:07	75.4	66.2	55.2
09:12	86.5	63.1	49.6
09:17	80.3	64.3	53.8
09:22	81.0	66.1	54.7
09:27	81.5	65.4	57.9
09:32	79.2	65.3	56.0
09:37	82.4	67.6	55.5
09:42	80.8	65.6	59.1
09:47	79.8	65.2	56.6
09:52	78.6	66.3	55.8
09:57	79.6	67.8	55.3
10:02	77.7	65.3	58.9
10:07	77.6	64.8	57.9
10:12	78.6	64.2	56.4
10:17	78.6	66.0	56.8
10:22	87.1	67.0	55.8
10:27	73.0	61.8	57.6
10:32	79.1	65.8	54.1
10:37	77.1	64.9	57.3
10:42	75.4	63.8	58.3
10:47	76.5	66.0	58.0
10:52	75.5	64.1	51.2
10:57	77.2	65.5	52.2
11:02	83.8	66.1	58.8
11:07	76.9	65.0	54.4
11:12	79.0	65.3	53.4
11:17	77.5	67.2	57.1
11:22	80.7	66.9	57.6
11:27	83.9	66.7	55.5
11:32	80.1	65.2	57.6
11:37	76.7	66.8	55.2
11:42	76.7	64.6	54.9
11:47	76.0	63.6	57.4
11:52	75.8	64.5	52.6
11:57	82.0	67.2	57.4
12:02	76.8	65.6	58.1
12:07	84.1	65.8	57.1
12:12	85.8	69.1	54.8
12:17	80.7	66.7	61.5
12:22	75.8	64.8	58.8

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Client: Bluebird Design Services

Date: 11/09/2020
Reference: 20200911_4703_ENA01.docx

Start Time	LAF(max)	LAeq	LA90
12:27	78.3	65.5	58.8
12:32	74.2	64.5	56.5
12:37	78.8	65.1	56.9
12:42	77.2	65.0	54.7
12:47	75.1	64.2	53.2

MP2

Start Time	LAF(max)	LAeq	LA90
13:22	54.3	50.9	49.1
13:27	53.7	50.2	48.1
13:32	55.3	50.4	49.0
13:37	54.1	50.0	48.2
13:42	56.2	50.0	48.0
13:47	52.8	49.6	47.9
13:52	71.0	51.3	48.5
13:57	62.3	50.7	48.4
14:02	53.3	49.9	48.3
14:07	52.9	49.6	47.7
14:12	55.0	50.1	47.7
14:17	62.1	53.2	48.8
14:22	55.7	50.9	49.3
14:27	54.3	50.5	48.3
14:32	55.4	49.6	47.6
14:37	54.1	49.3	46.5
14:42	54.3	50.2	48.3
14:47	54.5	49.5	47.3
14:52	54.6	50.3	48.0
14:57	53.9	49.7	46.9
15:02	55.0	49.3	47.1
15:07	57.5	49.6	46.6
15:12	57.0	50.1	47.4
15:17	55.8	49.0	46.4
15:22	57.1	49.6	47.2
15:27	57.6	49.8	46.9
15:32	58.8	49.5	46.8
15:37	61.1	50.5	47.7
15:42	61.6	49.6	47.0
15:47	57.5	49.1	46.3
15:52	56.7	48.9	46.9

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Start Time	LAF(max)	LAeq	LA90
15:57	57.1	49.0	46.3
16:02	58.7	49.7	46.6
16:07	56.4	50.4	46.7
16:12	57.8	49.7	46.0
16:17	53.4	47.4	44.2
16:22	53.9	47.7	43.2
16:27	52.1	47.6	43.5
16:32	52.1	46.7	44.4
16:37	55.9	47.0	43.0
16:42	54.1	46.3	43.1
16:47	53.8	45.5	41.0
16:52	58.2	48.1	43.5
16:57	54.5	47.7	43.7
17:02	54.0	47.1	43.3
17:07	56.0	49.1	45.4
17:12	53.1	47.8	44.0
17:17	53.7	46.3	42.9
17:22	52.2	45.0	41.5
17:27	54.4	47.6	43.8
17:32	52.7	46.8	42.8
17:37	56.5	46.8	43.0
17:42	55.3	45.8	41.4
17:47	56.2	45.3	41.1
17:52	64.3	49.4	39.4
17:57	55.9	46.9	42.5
18:02	58.8	48.3	40.4
18:07	57.7	47.3	40.9
18:12	51.7	45.5	42.3
18:17	54.5	45.9	41.0
18:22	53.6	45.9	39.3
18:27	52.1	44.3	40.9
18:32	58.6	47.3	37.4
18:37	53.1	46.1	42.0
18:42	52.1	44.9	40.3
18:47	49.7	43.5	36.2
18:52	54.4	43.3	37.3
18:57	50.4	43.5	39.7
19:02	48.7	42.1	37.1
19:07	52.7	42.0	37.2

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Start Time	LAF(max)	LAeq	LA90
19:12	54.4	44.4	38.8
19:17	49.6	41.7	36.3
19:22	51.2	42.2	37.5
19:27	49.6	42.7	37.1
19:32	51.4	42.7	36.1
19:37	52.6	45.1	40.4
19:42	51.1	41.2	32.5
19:47	49.4	41.4	34.5
19:52	49.4	39.6	35.1
19:57	49.6	40.8	34.2
20:02	49.7	38.6	33.4
20:07	50.6	40.9	33.7
20:12	52.8	40.9	33.7
20:17	51.7	41.9	35.4
20:22	52.8	40.0	32.3
20:27	49.9	40.5	34.4
20:32	51.7	37.7	31.4
20:37	46.4	35.6	30.5
20:42	52.1	39.9	31.3
20:47	47.8	37.9	31.0
20:52	52.3	39.0	32.2
20:57	52.6	40.3	32.5
21:02	50.2	38.1	32.2
21:07	47.9	36.2	29.7
21:12	45.0	37.3	32.1
21:17	51.9	39.4	32.0
21:22	53.9	40.7	33.2
21:27	49.7	36.9	29.5
21:32	48.4	35.7	29.2
21:37	60.9	42.5	31.4
21:42	49.4	35.6	29.5
21:47	35.8	30.7	29.0
21:52	44.9	35.3	30.1
21:57	36.5	29.6	28.4
22:02	47.1	32.0	29.3
22:07	42.3	31.5	30.1
22:12	48.3	37.6	31.1
22:17	51.2	37.8	33.4
22:22	40.4	34.0	32.2

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Start Time	LAF(max)	LAeq	LA90
22:27	51.7	39.0	31.6
22:32	69.8	54.7	32.6
22:37	66.4	47.4	32.7
22:42	49.8	37.3	33.1
22:47	48.9	37.5	32.3
22:52	51.8	39.2	32.5
22:57	47.2	37.7	33.6
23:02	51.6	40.2	33.1
23:07	54.6	40.6	34.8
23:12	42.1	35.4	33.0
23:17	43.0	35.7	33.0
23:22	50.6	39.8	33.6
23:27	42.7	33.7	31.2
23:32	46.0	35.3	32.1
23:37	37.8	32.8	31.5
23:42	48.2	36.7	33.6
23:47	48.6	36.0	32.4
23:52	49.8	37.4	31.8
23:57	38.5	32.8	31.0
00:02	51.8	38.4	31.1
00:07	49.3	37.7	29.9
00:12	51.8	42.3	36.1
00:17	52.3	42.2	34.6
00:22	51.9	43.3	33.3
00:27	52.0	42.3	36.8
00:32	46.9	38.8	34.4
00:37	54.7	42.6	36.1
00:42	48.6	37.8	30.1
00:47	52.2	40.0	31.9
00:52	50.5	41.9	34.7
00:57	49.0	38.3	31.5
01:02	49.4	41.9	35.7
01:07	50.6	42.9	37.9
01:12	49.5	42.9	38.4
01:17	49.8	43.0	37.0
01:22	52.8	44.2	38.4
01:27	52.4	45.3	40.9
01:32	47.9	43.7	40.8
01:37	51.3	43.5	38.5

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Start Time	LAF(max)	LAeq	LA90
01:42	48.9	42.3	39.6
01:47	49.9	42.8	39.0
01:52	48.9	43.8	40.6
01:57	50.2	44.3	41.7
02:02	52.7	45.2	41.4
02:07	51.7	47.3	44.4
02:12	52.5	47.6	45.1
02:17	54.0	47.4	45.4
02:22	53.0	48.6	45.9
02:27	52.0	47.1	45.2
02:32	53.5	48.0	45.5
02:37	54.7	49.0	46.3
02:42	52.1	47.4	45.2
02:47	55.6	47.6	45.2
02:52	53.7	47.7	45.8
02:57	52.3	46.8	45.0
03:02	56.9	46.9	44.9
03:07	52.8	47.1	45.2
03:12	58.4	48.7	46.5
03:17	53.4	47.2	45.5
03:22	51.5	47.3	45.7
03:27	55.1	46.6	44.9
03:32	55.4	47.1	45.1
03:37	59.6	48.1	44.7
03:42	54.4	47.1	45.2
03:47	60.5	47.3	45.2
03:52	67.9	47.9	45.4
03:57	60.4	47.4	45.1
04:02	57.6	47.6	45.2
04:07	53.7	47.3	45.3
04:12	60.9	47.1	45.4
04:17	59.2	47.9	46.3
04:22	59.6	48.6	46.8
04:27	59.6	49.4	47.0
04:32	61.1	50.1	47.3
04:37	60.4	49.6	47.1
04:42	59.9	50.1	47.6
04:47	60.5	49.3	47.2
04:52	59.6	49.0	47.0

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Start Time	LAF(max)	LAeq	LA90
04:57	56.7	47.4	45.0
05:02	60.3	48.5	45.6
05:07	61.3	47.8	46.1
05:12	60.9	47.9	45.2
05:17	55.6	45.3	43.6
05:22	58.9	47.7	44.3
05:27	61.1	46.7	44.4
05:32	57.7	46.2	44.1
05:37	58.9	45.9	43.1
05:42	51.0	45.6	43.5
05:47	55.5	45.9	43.1
05:52	58.1	45.3	42.4
05:57	55.9	46.1	43.0
06:02	54.1	45.1	43.0
06:07	52.8	47.3	44.2
06:12	56.2	45.9	43.9
06:17	52.3	46.0	43.6
06:22	52.1	46.2	44.0
06:27	55.5	46.1	43.6
06:32	61.8	46.2	42.7
06:37	60.1	48.3	43.1
06:42	57.3	44.4	42.2
06:47	58.8	43.1	41.1
06:52	52.5	44.5	42.0
06:57	53.2	45.9	42.6
07:02	56.2	46.4	43.2
07:07	63.6	48.9	42.4
07:12	57.5	44.2	41.7
07:17	58.9	46.8	42.0
07:22	58.9	45.9	41.8
07:27	53.5	45.2	41.7
07:32	55.3	45.3	42.6
07:37	57.7	44.6	42.1
07:42	55.3	46.2	41.2
07:47	51.4	44.6	41.3
07:52	51.2	43.1	40.4
07:57	53.6	42.6	39.7
08:02	51.0	44.5	40.5
08:07	49.9	42.5	39.1

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Start Time	LAF(max)	LAeq	LA90
08:12	61.5	45.0	40.4
08:17	59.3	46.1	40.7
08:22	64.2	42.4	39.1
08:27	52.4	42.8	40.2
08:32	52.4	45.2	42.0
08:37	56.0	45.0	42.0
08:42	61.0	46.3	41.9
08:47	53.2	44.3	41.7
08:52	61.8	46.1	42.7
08:57	67.3	51.7	43.0
09:02	61.7	46.8	43.3
09:07	60.4	48.3	44.4
09:12	60.8	48.1	43.9
09:17	63.2	49.2	44.7
09:22	61.6	49.2	43.5
09:27	56.5	47.8	43.6
09:32	58.6	43.4	41.0
09:37	53.2	44.2	40.4
09:42	52.0	43.8	40.5
09:47	50.0	44.8	41.9
09:52	64.3	50.9	42.4
09:57	51.8	45.0	41.7
10:02	53.3	44.3	41.9
10:07	53.5	45.7	42.0
10:12	53.6	43.5	41.3
10:17	54.2	44.0	41.5
10:22	52.7	43.9	40.9
10:27	56.4	46.8	41.7
10:32	59.7	45.2	41.0
10:37	53.8	45.1	40.3
10:42	55.6	45.6	41.0
10:47	64.8	52.3	40.7
10:52	59.0	45.4	40.7
10:57	71.2	57.4	40.9
11:02	52.7	44.0	40.6
11:07	50.8	43.4	41.9
11:12	52.0	44.2	41.2
11:17	59.1	46.2	41.8
11:22	50.9	44.1	41.5

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Date: 11/09/2020
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Start Time	LAF(max)	LAeq	LA90
11:27	65.7	48.1	42.4
11:32	60.9	48.5	43.1
11:37	70.7	53.4	47.3
11:42	69.7	53.2	46.6
11:47	59.0	46.2	44.0
11:52	55.4	46.8	43.1
11:57	54.9	45.3	43.1
12:02	52.4	44.7	42.6
12:07	57.8	47.1	43.5
12:12	51.5	45.0	42.8
12:17	50.3	44.5	42.0
12:22	53.2	45.5	43.0
12:27	63.3	50.6	42.7
12:32	56.3	46.9	43.3
12:37	53.3	44.0	42.4
12:42	51.1	43.7	42.1
12:47	62.4	48.2	42.3
12:52	49.2	44.1	42.6
12:57	54.7	45.0	42.8
13:02	50.3	44.3	42.4
13:07	54.4	46.0	43.4
13:12	52.9	45.3	43.0
13:17	53.7	46.1	44.1
13:22	55.6	47.8	44.2
13:27	54.7	47.4	44.0
13:32	49.9	45.3	43.2
13:37	51.2	45.5	43.8
13:42	54.0	47.4	43.7
13:47	49.7	45.5	43.5
13:52	53.7	47.0	44.4
13:57	54.3	46.2	43.4
14:02	61.8	51.5	44.8
14:07	54.5	46.9	43.7
14:12	55.1	47.9	44.5
14:17	52.7	46.6	44.0
14:22	63.0	50.7	44.2
14:27	55.3	48.7	44.7
14:32	64.1	52.1	44.2
14:37	54.0	46.2	44.0

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Start Time	LAF(max)	LAeq	LA90
14:42	52.3	45.9	43.6
14:47	49.0	44.6	43.0
14:52	50.4	45.1	43.0
14:57	48.0	44.9	43.3
15:02	54.2	46.2	43.1
15:07	53.9	45.4	43.1
15:12	50.4	44.3	42.0
15:17	59.2	47.9	42.4
15:22	53.7	46.2	42.7
15:27	52.7	45.3	42.1
15:32	57.8	45.9	42.2
15:37	54.9	47.6	43.5
15:42	54.8	47.0	43.0
15:47	50.5	44.5	42.4
15:52	53.1	45.1	42.2
15:57	53.6	46.0	42.4
16:02	54.2	44.7	42.1
16:07	55.8	46.9	42.4
16:12	48.1	42.7	41.3
16:17	52.9	44.0	41.3
16:22	51.2	43.4	41.3
16:27	61.7	50.0	41.9
16:32	46.5	42.8	41.0
16:37	47.5	43.6	41.3
16:42	50.3	44.4	41.6
16:47	46.3	42.3	41.0
16:52	51.2	42.0	40.4
16:57	46.1	41.8	40.2
17:02	51.9	43.4	40.4
17:07	53.8	45.7	41.4
17:12	48.8	43.7	41.2
17:17	51.5	44.2	41.2
17:22	46.4	42.8	41.2
17:27	46.9	42.8	41.0
17:32	61.9	48.5	41.8
17:37	52.1	43.7	41.2
17:42	58.0	48.6	40.9
17:47	51.0	43.9	42.3
17:52	49.4	44.4	42.1

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Start Time	LAF(max)	LAeq	LA90
17:57	62.5	49.8	41.9
18:02	61.1	48.6	43.0
18:07	48.3	43.4	41.6
18:12	58.9	49.9	43.1
18:17	59.5	49.7	42.5
18:22	57.8	43.8	42.1
18:27	50.5	43.8	41.9
18:32	48.3	43.5	41.8
18:37	63.1	50.8	42.3
18:42	59.7	49.9	43.0
18:47	54.2	46.1	42.5
18:52	49.3	45.1	42.5
18:57	54.4	45.1	42.4
19:02	51.3	44.5	42.5
19:07	62.0	51.2	42.0
19:12	47.1	43.9	42.5
19:17	47.7	44.6	43.2
19:22	46.7	42.7	41.2
19:27	47.4	42.4	40.2
19:32	50.0	44.5	43.0
19:37	57.8	43.3	41.1
19:42	52.1	44.2	41.9
19:47	46.3	43.5	42.0
19:52	48.4	44.0	42.3
19:57	53.1	43.7	40.7
20:02	53.4	42.9	40.2
20:07	48.0	43.2	41.0
20:12	46.4	42.1	40.5
20:17	46.7	42.3	39.3
20:22	46.6	41.6	39.9
20:27	48.3	43.7	41.5
20:32	54.8	43.1	40.6
20:37	55.7	43.5	40.3
20:42	47.4	42.5	39.2
20:47	46.2	41.9	39.2
20:52	46.9	42.8	40.8
20:57	50.5	43.4	41.0
21:02	47.9	42.5	40.4
21:07	47.8	42.4	40.2

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Start Time	LAF(max)	LAeq	LA90
21:12	46.4	41.2	39.3
21:17	49.9	41.9	39.1
21:22	46.3	41.2	38.2
21:27	50.3	42.5	39.5
21:32	47.7	39.6	37.3
21:37	45.5	39.8	38.0
21:42	43.8	40.2	38.2
21:47	48.7	41.3	38.5
21:52	46.4	40.0	38.1
21:57	44.5	39.6	37.3
22:02	57.3	40.8	36.5
22:07	45.7	40.6	37.9
22:12	50.5	41.0	38.2
22:17	52.2	41.0	37.4
22:22	42.8	38.7	36.3
22:27	47.9	39.2	36.1
22:32	41.7	36.1	34.1
22:37	45.0	39.9	37.1
22:42	45.6	40.6	37.3
22:47	45.6	39.9	37.0
22:52	43.6	39.3	36.1
22:57	45.4	38.9	35.8
23:02	52.8	40.1	36.0
23:07	45.6	37.6	34.7
23:12	48.0	38.9	36.1
23:17	51.7	40.3	37.0
23:22	50.8	40.7	37.2
23:27	43.4	38.1	36.0
23:32	47.3	39.3	36.2
23:37	45.0	38.0	36.1
23:42	45.0	39.4	37.4
23:47	47.8	39.0	36.4
23:52	48.0	41.6	38.6
23:57	47.8	40.3	37.2
00:02	51.8	42.1	38.5
00:07	48.8	41.8	37.8
00:12	50.5	41.9	39.4
00:17	50.8	41.4	38.3
00:22	57.8	45.5	40.5

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Start Time	LAF(max)	LAeq	LA90
00:27	56.3	43.2	39.3
00:32	52.3	42.3	39.5
00:37	51.8	41.8	39.2
00:42	52.0	43.1	40.5
00:47	45.0	40.4	38.6
00:52	47.2	41.5	39.8
00:57	51.9	44.2	42.0
01:02	54.4	44.8	42.0
01:07	54.2	43.8	41.9
01:12	52.4	44.3	41.7
01:17	51.8	45.5	43.1
01:22	52.5	46.5	43.3
01:27	51.9	46.8	44.4
01:32	53.1	46.2	44.1
01:37	53.3	47.1	44.5
01:42	49.8	46.3	44.2
01:47	52.6	47.8	46.0
01:52	52.0	47.4	46.0
01:57	55.0	48.4	45.9
02:02	49.9	46.5	45.1
02:07	50.3	46.9	45.3
02:12	52.7	47.3	45.2
02:17	54.2	49.9	46.3
02:22	53.0	49.4	47.7
02:27	55.3	49.1	46.7
02:32	54.6	50.1	47.2
02:37	56.7	50.6	48.6
02:42	56.1	51.1	48.5
02:47	58.9	51.9	48.7
02:52	60.8	53.7	50.2
02:57	56.1	52.7	50.5
03:02	56.3	52.7	50.0
03:07	56.7	52.7	50.5
03:12	55.2	51.3	49.9
03:17	53.8	50.7	49.4
03:22	54.0	51.4	50.2
03:27	59.8	51.0	49.2
03:32	61.7	51.4	49.4
03:37	58.7	52.6	50.1

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Start Time	LAF(max)	LAeq	LA90
03:42	53.7	50.6	49.0
03:47	55.7	51.8	50.2
03:52	55.0	51.8	50.2
03:57	57.8	51.6	49.7
04:02	61.0	51.1	48.2
04:07	59.0	50.7	49.1
04:12	59.6	51.3	49.3
04:17	61.3	51.3	49.2
04:22	60.7	51.4	49.6
04:27	60.4	52.2	50.0
04:32	60.6	52.0	49.9
04:37	60.7	51.9	49.8
04:42	59.3	51.5	49.4
04:47	63.8	50.7	48.3
04:52	59.6	50.8	48.6
04:57	58.7	49.7	47.4
05:02	59.4	50.0	48.0
05:07	55.6	49.8	48.0
05:12	58.3	51.6	49.3
05:17	56.4	50.9	49.0
05:22	54.3	50.7	49.2
05:27	53.9	50.8	49.5
05:32	57.1	50.8	49.2
05:37	56.5	50.9	49.5
05:42	57.7	50.3	49.2
05:47	57.0	51.0	49.2
05:52	55.4	52.0	50.6
05:57	55.9	51.5	49.3
06:02	53.4	50.2	49.1
06:07	55.0	50.3	49.0
06:12	57.2	50.2	48.6
06:17	53.8	50.4	49.1
06:22	54.5	51.3	49.7
06:27	54.6	51.4	50.0
06:32	55.7	50.4	48.5
06:37	53.1	48.9	47.1
06:42	53.2	48.9	47.4
06:47	52.7	48.4	47.1
06:52	55.7	49.3	47.2

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Start Time	LAF(max)	LAeq	LA90
06:57	56.9	51.8	49.0
07:02	59.7	51.7	48.8
07:07	59.5	52.4	47.0
07:12	55.6	48.2	46.7
07:17	59.1	49.5	46.7
07:22	59.1	51.3	48.5
07:27	60.0	52.9	50.3
07:32	63.4	52.1	49.1
07:37	63.4	51.1	46.8
07:42	58.3	50.0	46.5
07:47	56.2	52.1	49.4
07:52	55.6	51.4	48.1
07:57	55.4	48.4	42.6
08:02	46.9	42.0	40.2
08:07	50.0	43.5	41.2
08:12	58.0	48.1	41.6
08:17	61.9	47.8	41.1
08:22	56.3	44.9	41.1
08:27	51.3	43.4	41.0
08:32	53.5	42.5	40.2
08:37	50.1	43.7	41.6
08:42	67.2	49.0	42.6
08:47	61.5	47.9	43.5
08:52	55.9	44.9	42.2
08:57	64.4	47.3	43.0
09:02	59.4	47.2	44.0
09:07	55.6	45.6	41.9
09:12	60.8	45.6	41.5
09:17	62.1	45.9	41.9
09:22	58.7	48.1	43.1
09:27	59.2	49.7	44.6
09:32	55.8	46.2	41.8
09:37	61.9	51.7	44.5
09:42	70.8	56.4	42.4
09:47	58.4	49.1	42.4
09:52	49.8	41.6	37.4
09:57	46.6	40.0	37.2
10:02	46.4	40.2	37.7
10:07	51.3	43.4	40.6

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Start Time	LAF(max)	LAeq	LA90
10:12	56.3	44.2	41.5
10:17	56.0	45.2	40.6
10:22	55.9	44.3	40.3
10:27	55.4	47.0	43.7
10:32	56.0	47.6	43.3
10:37	52.3	44.7	42.1
10:42	54.5	46.6	44.1
10:47	51.0	45.0	42.3
10:52	51.8	45.3	42.1
10:57	56.2	44.5	42.1
11:02	52.8	45.2	42.6
11:07	52.6	42.0	39.5
11:12	54.4	46.4	40.1
11:17	50.3	44.0	39.5
11:22	51.9	44.0	42.0
11:27	67.3	45.6	43.0
11:32	66.9	48.2	44.0
11:37	70.4	55.3	48.7
11:42	67.2	56.0	46.6
11:47	66.3	53.7	45.3
11:52	61.6	50.2	41.7
11:57	61.6	48.8	41.5
12:02	55.3	47.3	44.4
12:07	62.6	52.2	44.2
12:12	57.8	48.9	45.0
12:17	58.1	48.5	44.8
12:22	59.0	49.0	45.3
12:27	62.8	52.5	46.8
12:32	57.7	50.5	45.5
12:37	64.2	53.2	45.9
12:42	62.7	52.3	46.4
12:47	64.3	50.3	46.3
12:49	54.4	48.0	45.9