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Yorkshire House, Shambles Street, Barnsley

Assessment of Proposed Residential Conversion

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1.0 Executive Summary

1.1 Sharps Gayler LLP (SGL) have been instructed to provide an acoustic assessment relating to a proposed conversion of offices to residential use at "Yorkshire House", Shambles Street, Barnsley, to assess the impact of noise from commercial premises on the intended occupiers of the development.

1.2 The assessment has been undertaken by noise surveys at the site.

1.3 The assessment has been based on advice in BS8233:2014, in conjunction with the World Health Organisation Guidelines and typical music noise break-in criteria.

1.4 Recommendations are made on the likelihood of achieving an acceptable internal noise environment for future residents against present international and national guidelines.

1.5 Measurements and calculations demonstrates that an acceptable living environment could be achieved, with the provision of the minimum standard of glazing and ventilation set out.

1.6 The conclusions of the assessment are that the noise environment is such that the conversion to residential use can proceed in a way which provides an acceptable noise climate for future residents with special acoustic measures and non-standard construction.

2.0 Introduction

2.1 Sharps Gayler LLP (SGL) has been commissioned to provide an acoustic assessment relating to a proposed residential development at "Yorkshire House", Shambles Street, Barnsley. This report will assess the likelihood of acceptable internal noise conditions for proposed residents considering the sound insulation requirements of the building external envelope necessary to achieve appropriate internal noise level criteria.

2.2 The building is currently an office building at first (limited floor area), second and third floors, with commercial units at ground floor level, including restaurants. The "Soul Lounge" previously occupied the ground floor as a nightclub, although there was no planning permission granted to allow this, and the use was therefore unlawful. The nightclub is no longer operating in the ground floor unit, and a recent change of use application (2018/0600) has confirmed this unit as a mixed use Sui Generis/A3 Use class (Tanning and Beauty Salon and Café).

2.3 Adjacent to the building is a Public House, "The Londoner." Shambles Street is a busy road into and out of Barnsley town centre. It is proposed to convert part of the first floor and the second and third floors of the building to residential apartments, but retain the commercial uses in the ground floor. It is understood that a noise assessment is required under the Town and Country Planning (General Permitted Development) (England) (Amendment) Order 2016. Paragraph O.2 (d) of that order requires that assessment of the impacts of noise from commercial premises on the intended occupiers of the development be undertaken.

2.4 This report details the environmental noise survey undertaken to assess the existing noise climate at the site, including noise from road traffic and commercial activity on Shambles Street (including within the building subject to this proposal). This data forms the basis of assessing the likely future noise environment inside the building and the acoustic requirements of the building, in order to achieve acceptable internal noise criteria for residential use.

3.0 Assessment Criteria

3.1 The nationally accepted design standards for residential premises are contained in BS 8233:2014. Table 4 of the standard contains the following design targets for residential dwellings, which are adopted in the assessment that follows:

BS8233:2014 Table 4 – Indoor ambient noise levels for dwellings

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB LAeq, 16 hour	--
Dining	Dining room/area	40 dB LAeq, 16 hour	--
Sleeping (daytime resting)	Bedroom	35 dB LAeq, 16 hour	30 dB LAeq, 8hour

3.2 There is no longer an LAMAX standard for bedrooms In BS 8233. However, footnote 4 to Table 4 states 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 LAmax,F depending on the character and number of events per night. Sporadic noise events could require separate values."* In this case, it is proposed that the previous BS 8233 internal standard (also referenced in World Health Organisation Guidelines for Community Noise) is applied. This is 45 dB LAMAX, inside bedrooms.

4.0 Noise Survey

4.1 An environmental noise survey was carried out from 26th to 31st October 2017 to determine the existing noise levels at the site. Continuous measurements were made externally at the front (Shambles Street) façade of the building. These measurements were taken continuously over the period which included a weekend and weekdays.

4.2 All measurements were made in 15 minute periods and were made using Norsonic 140 sound level meters. The meters used are of Class 1 type and were field checked for calibration before and after the measurements. No drift was noted.

4.3 The weather was cool and dry with low wind speeds and meteorological conditions are not believed to have affected the measurements. The meters allow simultaneous measurements of noise levels both in overall dBA values and frequency selective octave bands over predetermined time periods, using various measurement parameters. The Leq, L90 and LMAX noise levels were recorded in overall dBA values together with octave band levels. For music noise peaks, we use the L5 parameter to represent typical regular music noise (e.g. from the regular bass beat).

4.4 For information purposes it can be noted:

- dBA is the sound level in decibels (dB) measured by the sound level meter with the A-weighting.
- The A-weighting is a filter applied to the sound level meter to simulate the frequency response of the human ear, which is more sensitive to high frequency sound than low.
- Leq is the equivalent continuous noise level which is a method of averaging the varying noise level over the time period into a single figure value. The Leq has the same sound energy as the fluctuating level over that period.
- LMAX is the highest level within the measurement period.
- L90 is the noise level exceeded for 90% of the time and is referred to as the background noise level.
- L5 is the noise level exceeded for 5% of the time (used to represent regular peaks from music noise).

5.0 Survey Results

External Levels

5.1 The full data set is included in Appendix A. Design levels are summarised below. These detail the daytime LAeq,16Hr and night-time LAeq, 8Hr and LAMAX levels outside the building. These are façade levels:

Established External Façade Levels

	Day 0700-2300 hours	**Night 2300-0700 hours**	**Night 2300-0700 hours**	**Night 2300-0700 hours**
	LAeq, 16 hour, dB	**LAeq, 8 Hour, dB**	**LA1%**	**Typical LAMAX**
Thursday, 26th October	*69.7	61.5	71.0	77.7
Friday, 27th October	70.7	65.1	74.1	81.8
Saturday, 28th October	69.4	65.7	74.5	81.8
Sunday, 29th October	67.5	62.7	71.8	78.5
Monday, 30th October	69.8	62.7	69.9	77.5
Tuesday, 31st October	*69.4	-	-	-

Shorter duration than T < 16hour

5.2 Peak noise levels have been measured at a level of LAeq1hour = 68 dB, particularly during the early night when the public houses are closing (Saturday night between 2300 and 0000 hours).

6.0 Internal Noise

6.1 SGL has previously determined by estimation based on measured internal sound levels that the sound insulation of the typical floor separating the retail units below and the existing units on the first floor as approximately 50dBA. This level difference was based on a music noise spectrum, with the previous occupiers (Soul Lounge) operating.

6.2 Whilst the Unit was vacant (after Soul Lounge vacated), an opportunity was taken to test the sound insulation of the separating structure between the commercial unit and the floors above (see Report attached as Appendix C). The test showed an average sound insulation value (Insertion Loss, IL) of 60 dBA.

6.3 As set out in the sound insulation report, internal levels in the units at ground floor would need to exceed 85 dBA for the residential units above to be exposed to internally generated sound levels in excess of NR20. SGL had previous advised that the insulation value of the floor would be sufficient to reduce the resultant noise level in the proposed residential units to acceptable levels where sound levels in the ground floor retail/restaurant units do not exceed a reverberant noise level of LAeqT=75 dB. Typically, most restaurant operations do not produce sound levels in excess of this noise level, and there is now an additional 10 dB leeway in that previous advice, based on tested insulation values.

6.4 The Tanning Salon and café will not generate levels close to 85 dBA under any circumstances. In addition, the operating hours of the salon are limited to 08:00 to 20:00, which would not encroach on the night time period when residents in the proposed converted apartment above would be using bedrooms (our previous advice was based on an entertainment or restaurant use which may extend into the night time period.

6.5 Similarly, any other activity under Use Class A1 'Shops', A2 'Financial and Professional Services' or A3 'Restaurant and Café' would be very unlikely to generate noise levels exceeding 85dBA.

6.6 Internally generated noise, therefore, is not of concern.

7.0 Sound Insulation of the Building Envelope – External Noise

7.1 In the absence of Soul Lounge, the noise environment is now dominated by road traffic noise. Whilst not a consideration for change of use under the permitted development rights (as is the case here), the advice below is given for completeness and to provide an appropriate future noise environment for residents.

7.2 It will be necessary to replace the existing office window system as part of the redevelopment in order to provide adequate levels of sound insulation. External levels of 65 dB LAeq and 82 dB LAMAX at night require reduction to 30 dB LAeq and 45 dB LAMAX internally. This means that the window system needs to provide overall sound insulation in excess of 45 dB. The system would need to be either a heavyweight acoustic double-glazed system or a double-glazed system with a secondary internal pane and deep (minimum 100 mm) separating cavity, with acoustically lined reveals. The installation of replacement windows may be achieved under the permitted development rights alongside the change of use.

7.3 The Sound reduction performance (based on a Pilkingtons 10-12-6-100-6(lined) secondary glazing system, for example) should meet 49 dB R_w overall, equivalent to 45 dB R_W+C_{TR}. The spectrum performance is also important, however, and the figures in the table below should be seen as a minimum example performance:

Minimum Recommended Window System Performance

R dB	**Octave band centre frequency Hz**							
	63	125	250	500	1k	2k	4k	Rw
6-12.6-100-6(lined)	28	33	40	46	48	56	65	49

Ventilation

7.4 Ventilation, in accordance with Building Regulations, would need to be provided to residential units. This can usually be achieved by way of acoustic vents, either in the window frames or through the walls or via a whole-building system (such as a Mechanical Ventilation and Heat Recovery System, MVHR). The acoustic performance of the vents should be such as to not to degrade the sound insulation performance of the façade as a whole. This is, however, unlikely to be achieved with ventilation openings in the Shambles Street façade, so it is recommended that a mechanical system be installed, with air drawn from an alternative façade and a ducted system of distribution (to include acoustic in-line sound attenuators as necessary).

7.5 These requirements represent special design solutions and non-standard construction methods, but are available from specialist manufacturers.

7.6 An example of the possible construction and the acoustic performance is given in appendix B.

7.7 Further advice can be given when further details are available as part of the design and construction process.

8.0 Conclusions

8.1 A noise survey has been conducted; the noise climate at the site has been measured, including the influence of road traffic, and commercial noise from the other uses at ground floor level in the building and adjacent (The Londoner PH).

8.2 Internal noise level criteria have been proposed in line with the standards set out in BS 8233:2014 and the World Health Organisation Guidelines.

8.3 The noise environment is now dominated by road traffic noise. Further assessment using survey data gathered demonstrates that an acceptable living environment could be achieved, with the provisions set out above.

8.4 The conclusions of the assessment are that the noise environment is such that the conversion to residential use can only proceed in a way, which provides an acceptable noise climate for future residents with special acoustic measures and non-standard construction methods.

Appendix A: Noise Survey Results

Barnsley - Shambles Street

Tuesday, October 31, 2017	8:48	(0:0:5.0)	114.2
Thursday, October 26, 2017	10:09	(0:0:9.0)	114

Equipment: Norsonic 140 + wet weather kit
Weather: Clear and dry with no decernable wind
Location: Over looking Shambles street (first floor)

Date	Start time	Duration	LAeq	LAFmax	LA1	LA10	LA90
Thursday, October 26, 2017	11:00	(0:14:57.0)	69.1	78.5	75.8	72.5	63.6
Thursday, October 26, 2017	11:15	(0:14:57.0)	69.3	83.9	76.4	72.4	62.8
Thursday, October 26, 2017	11:30	(0:14:57.0)	69.3	83.5	76.3	72.1	63.6
Thursday, October 26, 2017	11:45	(0:14:57.0)	68.8	79.9	75.7	72.0	63.8
Thursday, October 26, 2017	12:00	(0:14:58.0)	68.8	81.0	75.6	71.8	64.0
Thursday, October 26, 2017	12:15	(0:14:58.0)	70.3	85.0	80.3	72.5	63.3
Thursday, October 26, 2017	12:30	(0:14:58.0)	69.6	84.4	77.5	72.3	63.7
Thursday, October 26, 2017	12:45	(0:14:57.0)	69.8	89.1	78.9	71.9	63.3
Thursday, October 26, 2017	13:00	(0:14:57.0)	69.4	86.5	77.9	72.1	63.8
Thursday, October 26, 2017	13:15	(0:14:58.0)	69.4	81.2	77.1	72.6	63.8
Thursday, October 26, 2017	13:30	(0:14:58.0)	70.3	92.7	77.2	71.9	63.7
Thursday, October 26, 2017	13:45	(0:14:58.0)	69.4	82.5	77.2	72.2	64.0
Thursday, October 26, 2017	14:00	(0:14:58.0)	69.4	81.9	78.5	72.3	64.0
Thursday, October 26, 2017	14:15	(0:14:58.0)	69.3	82.3	76.3	71.9	63.9
Thursday, October 26, 2017	14:30	(0:14:58.0)	70.7	87.6	81.9	72.6	63.6
Thursday, October 26, 2017	14:45	(0:14:58.0)	69.2	82.8	76.7	71.8	64.2
Thursday, October 26, 2017	15:00	(0:14:57.0)	69.2	79.0	75.7	72.1	64.1
Thursday, October 26, 2017	15:15	(0:14:58.0)	68.9	81.4	75.0	71.9	63.7
Thursday, October 26, 2017	15:30	(0:14:58.0)	69.3	81.1	76.2	71.9	63.9
Thursday, October 26, 2017	15:45	(0:14:57.0)	69.7	82.0	77.3	72.4	64.0
Thursday, October 26, 2017	16:00	(0:14:58.0)	70.5	84.6	77.8	72.9	65.2
Thursday, October 26, 2017	16:15	(0:14:58.0)	69.7	80.3	74.9	72.4	64.9
Thursday, October 26, 2017	16:30	(0:14:58.0)	70.3	83.3	77.6	73.0	65.1
Thursday, October 26, 2017	16:45	(0:14:58.0)	70.6	84.2	78.8	73.3	64.5
Thursday, October 26, 2017	17:00	(0:14:58.0)	69.6	90.9	76.8	72.4	62.0
Thursday, October 26, 2017	17:15	(0:14:58.0)	68.6	80.5	74.7	71.7	60.8
Thursday, October 26, 2017	17:30	(0:14:58.0)	69.3	88.2	78.9	72.0	60.9
Thursday, October 26, 2017	17:45	(0:14:58.0)	70.8	89.5	82.7	72.7	60.1
Thursday, October 26, 2017	18:00	(0:14:58.0)	68.4	78.9	75.4	72.1	60.0
Thursday, October 26, 2017	18:15	(0:14:58.0)	67.8	80.7	75.6	71.5	58.5
Thursday, October 26, 2017	18:30	(0:14:58.0)	68.4	87.6	76.3	71.2	59.5
Thursday, October 26, 2017	18:45	(0:14:57.0)	68.0	81.6	76.6	71.5	58.2
Thursday, October 26, 2017	19:00	(0:14:58.0)	67.6	82.2	75.6	71.3	58.1
Thursday, October 26, 2017	19:15	(0:14:58.0)	67.3	81.1	74.8	71.2	58.2
Thursday, October 26, 2017	19:30	(0:14:56.0)	67.2	82.8	74.7	71.1	56.8
Thursday, October 26, 2017	19:45	(0:14:58.0)	65.7	76.4	73.6	69.9	55.5
Thursday, October 26, 2017	20:00	(0:14:57.0)	67.1	79.0	75.2	71.3	56.2
Thursday, October 26, 2017	20:15	(0:14:58.0)	67.0	86.7	76.7	70.5	55.9
Thursday, October 26, 2017	20:30	(0:14:57.0)	65.2	78.9	73.9	69.3	54.1
Thursday, October 26, 2017	20:45	(0:14:58.0)	65.5	86.4	73.9	69.4	54.9
Thursday, October 26, 2017	21:00	(0:14:57.0)	65.5	83.2	74.3	69.6	53.3
Thursday, October 26, 2017	21:15	(0:14:57.0)	79.5	114.8	78.6	69.2	53.3
Thursday, October 26, 2017	21:30	(0:14:57.0)	66.1	83.3	76.8	69.5	53.0
Thursday, October 26, 2017	21:45	(0:14:58.0)	66.6	89.4	76.0	69.5	51.9
Thursday, October 26, 2017	22:00	(0:14:57.0)	67.4	87.7	76.8	71.0	53.2
Thursday, October 26, 2017	22:15	(0:14:58.0)	63.9	78.4	72.6	68.7	50.5
Thursday, October 26, 2017	22:30	(0:14:57.0)	64.7	79.1	75.0	68.9	48.7
Thursday, October 26, 2017	22:45	(0:14:57.0)	67.2	90.6	79.1	68.7	50.0
Thursday, October 26, 2017	23:00	(0:14:57.0)	64.2	82.6	75.5	67.8	44.3
Thursday, October 26, 2017	23:15	(0:14:58.0)	62.2	75.7	73.0	66.0	45.0
Thursday, October 26, 2017	23:30	(0:14:57.0)	64.2	86.4	76.7	66.7	42.2
Thursday, October 26, 2017	23:45	(0:14:57.0)	59.1	72.7	70.2	63.2	40.2
Friday, October 27, 2017	0:00	(0:14:57.0)	61.1	83.3	73.6	62.6	40.6
Friday, October 27, 2017	0:15	(0:14:57.0)	60.5	79.3	73.0	63.9	39.3
Friday, October 27, 2017	0:30	(0:14:58.0)	59.3	77.2	71.4	62.2	40.2
Friday, October 27, 2017	0:45	(0:14:58.0)	52.7	73.9	65.3	54.5	38.5
Friday, October 27, 2017	1:00	(0:14:58.0)	59.0	79.3	70.9	60.7	39.2
Friday, October 27, 2017	1:15	(0:14:58.0)	54.5	76.1	68.5	54.5	38.2
Friday, October 27, 2017	1:30	(0:14:58.0)	56.9	76.4	70.5	56.8	38.9
Friday, October 27, 2017	1:45	(0:14:58.0)	53.9	76.2	67.8	54.3	36.2
Friday, October 27, 2017	2:00	(0:14:58.0)	53.1	75.3	66.4	48.5	36.8
Friday, October 27, 2017	2:15	(0:14:58.0)	51.6	72.8	64.7	51.3	36.8
Friday, October 27, 2017	2:30	(0:14:58.0)	47.7	63.3	60.5	51.0	36.4
Friday, October 27, 2017	2:45	(0:14:58.0)	59.1	84.2	70.6	52.8	36.2
Friday, October 27, 2017	3:00	(0:14:55.0)	52.8	71.3	67.0	54.2	37.5
Friday, October 27, 2017	3:15	(0:14:58.0)	53.4	73.5	67.3	54.2	37.6
Friday, October 27, 2017	3:30	(0:14:58.0)	53.3	72.9	67.3	53.3	37.4
Friday, October 27, 2017	3:45	(0:14:57.0)	55.1	75.7	69.9	53.2	37.2
Friday, October 27, 2017	4:00	(0:14:58.0)	55.4	75.2	70.0	52.7	37.5
Friday, October 27, 2017	4:15	(0:14:58.0)	56.1	75.5	69.3	56.8	38.0
Friday, October 27, 2017	4:30	(0:14:58.0)	57.0	75.2	70.2	58.8	37.7
Friday, October 27, 2017	4:45	(0:14:58.0)	56.9	75.4	70.2	57.3	38.4
Friday, October 27, 2017	5:00	(0:14:58.0)	57.5	75.8	70.0	59.4	39.8
Friday, October 27, 2017	5:15	(0:14:57.0)	59.8	75.1	71.2	63.7	41.5
Friday, October 27, 2017	5:30	(0:14:58.0)	62.5	76.5	72.8	66.6	45.0
Friday, October 27, 2017	5:45	(0:14:58.0)	63.4	88.8	73.7	66.0	46.7
Friday, October 27, 2017	6:00	(0:14:58.0)	69.3	89.1	81.5	71.3	47.5
Friday, October 27, 2017	6:15	(0:14:58.0)	66.1	82.4	77.0	70.1	49.0
Friday, October 27, 2017	6:30	(0:14:58.0)	67.9	86.5	79.9	71.1	48.9
Friday, October 27, 2017	6:45	(0:14:58.0)	66.5	84.3	75.2	70.5	53.8
Friday, October 27, 2017	7:00	(0:14:57.0)	67.7	87.4	78.6	71.3	52.7
Friday, October 27, 2017	7:15	(0:14:58.0)	68.3	82.9	76.8	72.5	57.7
Friday, October 27, 2017	7:30	(0:14:58.0)	68.5	82.3	75.9	72.5	60.1
Friday, October 27, 2017	7:45	(0:14:58.0)	69.6	89.1	78.5	72.5	60.1
Friday, October 27, 2017	8:00	(0:14:58.0)	69.6	83.3	77.0	73.1	63.4
Friday, October 27, 2017	8:15	(0:14:58.0)	70.5	83.9	78.1	73.3	65.1
Friday, October 27, 2017	8:30	(0:14:58.0)	72.9	82.9	79.0	75.5	66.6
Friday, October 27, 2017	8:45	(0:14:57.0)	72.1	82.8	79.2	75.3	65.5
Friday, October 27, 2017	9:00	(0:14:58.0)	69.5	80.2	76.5	72.9	63.2
Friday, October 27, 2017	9:15	(0:14:57.0)	70.6	84.6	79.5	73.4	63.7
Friday, October 27, 2017	9:30	(0:14:58.0)	74.8	101.8	84.9	73.7	63.9

Date	Start time	Duration	LAeq	LAFmax	LA1	LA10	LA90
Friday, October 27, 2017	9:45	(0:14:57.0)	69.5	81.2	77.1	72.2	64.0
Friday, October 27, 2017	10:00	(0:14:58.0)	70.5	88.0	77.4	73.1	63.8
Friday, October 27, 2017	10:15	(0:14:58.0)	69.9	83.4	77.1	72.9	63.9
Friday, October 27, 2017	10:30	(0:14:58.0)	76.1	101.1	85.5	73.5	63.8
Friday, October 27, 2017	10:45	(0:14:57.0)	69.7	80.0	77.0	73.0	63.9
Friday, October 27, 2017	11:00	(0:14:57.0)	69.1	80.9	75.1	72.3	63.3
Friday, October 27, 2017	11:15	(0:14:57.0)	69.8	84.1	76.9	72.9	64.4
Friday, October 27, 2017	11:30	(0:14:57.0)	69.5	82.9	77.1	72.2	63.6
Friday, October 27, 2017	11:45	(0:14:57.0)	69.8	81.3	76.7	72.9	63.9
Friday, October 27, 2017	12:00	(0:14:58.0)	70.5	86.5	78.4	73.1	64.4
Friday, October 27, 2017	12:15	(0:14:57.0)	69.8	82.0	78.7	72.6	63.9
Friday, October 27, 2017	12:30	(0:14:57.0)	70.1	85.8	78.0	72.9	63.5
Friday, October 27, 2017	12:45	(0:14:57.0)	69.2	81.3	77.0	72.2	63.4
Friday, October 27, 2017	13:00	(0:14:58.0)	70.7	101.0	75.8	72.0	64.0
Friday, October 27, 2017	13:15	(0:14:57.0)	69.1	84.7	76.1	72.1	63.6
Friday, October 27, 2017	13:30	(0:14:58.0)	77.5	104.2	86.2	73.4	64.4
Friday, October 27, 2017	13:45	(0:14:57.0)	70.5	86.8	80.5	72.5	63.9
Friday, October 27, 2017	14:00	(0:14:57.0)	70.2	82.3	77.4	73.2	64.8
Friday, October 27, 2017	14:15	(0:14:56.0)	69.5	82.1	76.5	72.3	63.7
Friday, October 27, 2017	14:30	(0:14:57.0)	70.7	85.2	79.6	73.3	64.2
Friday, October 27, 2017	14:45	(0:14:57.0)	69.5	85.1	77.4	72.4	63.7
Friday, October 27, 2017	15:00	(0:14:57.0)	70.3	83.3	77.9	72.9	64.5
Friday, October 27, 2017	15:15	(0:14:57.0)	70.1	82.5	77.1	73.1	64.2
Friday, October 27, 2017	15:30	(0:14:57.0)	70.4	84.2	77.4	73.0	65.1
Friday, October 27, 2017	15:45	(0:14:57.0)	70.0	84.3	78.5	72.8	63.7
Friday, October 27, 2017	16:00	(0:14:57.0)	70.1	85.7	75.6	72.8	64.9
Friday, October 27, 2017	16:15	(0:14:57.0)	70.8	87.6	77.7	73.0	64.9
Friday, October 27, 2017	16:30	(0:14:58.0)	69.6	80.8	76.0	72.5	64.5
Friday, October 27, 2017	16:45	(0:14:57.0)	70.5	87.8	78.6	72.8	65.0
Friday, October 27, 2017	17:00	(0:14:58.0)	69.7	83.9	77.9	72.4	62.9
Friday, October 27, 2017	17:15	(0:14:57.0)	70.5	88.5	79.4	73.2	61.4
Friday, October 27, 2017	17:30	(0:14:57.0)	68.6	80.8	76.2	72.1	60.8
Friday, October 27, 2017	17:45	(0:14:57.0)	69.7	84.3	77.7	72.9	62.2
Friday, October 27, 2017	18:00	(0:14:57.0)	69.0	84.9	77.4	71.9	61.6
Friday, October 27, 2017	18:15	(0:14:57.0)	69.7	91.9	77.8	72.2	59.3
Friday, October 27, 2017	18:30	(0:14:57.0)	68.2	79.3	76.0	71.8	59.9
Friday, October 27, 2017	18:45	(0:14:55.0)	68.9	86.9	76.5	72.1	61.1
Friday, October 27, 2017	19:00	(0:14:57.0)	69.1	90.6	76.9	72.1	59.5
Friday, October 27, 2017	19:15	(0:14:57.0)	68.3	83.6	75.3	71.8	60.3
Friday, October 27, 2017	19:30	(0:14:58.0)	68.3	88.4	76.5	72.2	57.9
Friday, October 27, 2017	19:45	(0:14:58.0)	68.7	85.1	76.3	71.9	59.9
Friday, October 27, 2017	20:00	(0:14:57.0)	69.9	95.2	78.0	71.7	59.2
Friday, October 27, 2017	20:15	(0:14:57.0)	67.8	80.8	77.9	71.0	59.2
Friday, October 27, 2017	20:30	(0:14:58.0)	67.4	83.9	76.0	71.0	59.0
Friday, October 27, 2017	20:45	(0:14:58.0)	70.4	98.3	79.1	72.3	60.0
Friday, October 27, 2017	21:00	(0:14:57.0)	69.5	89.1	78.6	71.8	61.8
Friday, October 27, 2017	21:15	(0:14:57.0)	68.5	87.5	78.2	70.7	62.2
Friday, October 27, 2017	21:30	(0:14:57.0)	68.8	87.1	76.9	71.6	62.2
Friday, October 27, 2017	21:45	(0:14:57.0)	70.5	90.2	81.2	72.4	63.3
Friday, October 27, 2017	22:00	(0:14:58.0)	70.1	86.2	81.0	72.4	62.8
Friday, October 27, 2017	22:15	(0:14:57.0)	77.8	113.4	84.2	72.4	62.0
Friday, October 27, 2017	22:30	(0:14:57.0)	69.5	87.4	79.8	71.9	62.1
Friday, October 27, 2017	22:45	(0:14:57.0)	68.4	86.4	78.5	70.9	61.9
Saturday, October 28, 2017	23:00	(0:14:57.0)	68.0	87.2	76.5	71.0	60.6
Saturday, October 28, 2017	23:15	(0:14:58.0)	66.2	81.1	75.2	69.8	59.3
Saturday, October 28, 2017	23:30	(0:14:57.0)	68.4	92.3	76.6	69.5	57.7
Saturday, October 28, 2017	23:45	(0:14:58.0)	68.2	91.0	80.1	70.6	52.4
Saturday, October 28, 2017	0:00	(0:14:57.0)	66.3	86.8	77.4	69.5	52.1
Saturday, October 28, 2017	0:15	(0:14:58.0)	64.8	82.6	76.1	68.4	51.7
Saturday, October 28, 2017	0:30	(0:14:58.0)	63.9	78.8	74.2	68.2	50.8
Saturday, October 28, 2017	0:45	(0:14:58.0)	65.3	81.6	75.1	70.1	49.0
Saturday, October 28, 2017	1:00	(0:14:57.0)	66.4	89.6	75.2	68.5	48.7
Saturday, October 28, 2017	1:15	(0:14:57.0)	63.8	85.1	73.6	66.4	45.8
Saturday, October 28, 2017	1:30	(0:14:58.0)	62.5	79.8	73.5	67.1	45.8
Saturday, October 28, 2017	1:45	(0:14:57.0)	63.1	80.7	74.5	67.0	46.3
Saturday, October 28, 2017	2:00	(0:14:58.0)	60.7	76.4	72.5	64.0	43.0
Saturday, October 28, 2017	2:15	(0:14:58.0)	62.2	79.6	73.3	66.2	43.9
Saturday, October 28, 2017	2:30	(0:14:57.0)	61.4	82.0	72.1	64.9	44.1
Saturday, October 28, 2017	2:45	(0:14:58.0)	59.4	75.5	70.8	62.4	44.4
Saturday, October 28, 2017	3:00	(0:14:58.0)	60.6	76.2	72.3	64.1	41.8
Saturday, October 28, 2017	3:15	(0:14:58.0)	59.0	78.0	70.8	61.5	43.3
Saturday, October 28, 2017	3:30	(0:14:58.0)	69.2	80.6	74.7	71.7	42.9
Saturday, October 28, 2017	3:45	(0:14:58.0)	67.0	76.7	72.8	71.3	43.1
Saturday, October 28, 2017	4:00	(0:14:57.0)	57.4	76.6	70.6	58.8	39.7
Saturday, October 28, 2017	4:15	(0:14:58.0)	56.8	74.7	70.3	58.2	39.5
Saturday, October 28, 2017	4:30	(0:14:58.0)	58.2	75.3	70.7	61.1	40.8
Saturday, October 28, 2017	4:45	(0:14:58.0)	58.1	75.9	70.6	60.6	39.8
Saturday, October 28, 2017	5:00	(0:14:57.0)	57.9	75.1	71.0	59.6	40.5
Saturday, October 28, 2017	5:15	(0:14:57.0)	58.0	78.3	70.1	59.4	40.3
Saturday, October 28, 2017	5:30	(0:14:58.0)	69.3	83.5	75.3	71.4	43.6
Saturday, October 28, 2017	5:45	(0:14:57.0)	70.3	89.3	80.8	71.6	45.7
Saturday, October 28, 2017	6:00	(0:14:57.0)	66.1	87.8	78.4	66.1	47.0
Saturday, October 28, 2017	6:15	(0:14:57.0)	64.0	79.4	76.6	67.1	48.7
Saturday, October 28, 2017	6:30	(0:14:58.0)	65.8	92.9	75.5	68.1	48.9
Saturday, October 28, 2017	6:45	(0:14:58.0)	64.4	81.2	74.9	68.8	49.4
Saturday, October 28, 2017	7:00	(0:14:58.0)	64.0	83.2	75.8	65.8	48.2
Saturday, October 28, 2017	7:15	(0:14:57.0)	64.5	78.1	74.9	69.4	49.2
Saturday, October 28, 2017	7:30	(0:14:57.0)	68.3	92.3	79.8	69.7	52.7
Saturday, October 28, 2017	7:45	(0:14:58.0)	66.2	80.8	75.7	70.7	54.3
Saturday, October 28, 2017	8:00	(0:14:58.0)	67.8	87.5	76.2	71.5	57.0
Saturday, October 28, 2017	8:15	(0:14:58.0)	68.3	82.2	77.2	72.3	58.8
Saturday, October 28, 2017	8:30	(0:14:57.0)	69.2	87.6	78.9	72.7	58.3
Saturday, October 28, 2017	8:45	(0:14:58.0)	68.2	81.3	75.0	71.9	60.7
Saturday, October 28, 2017	9:00	(0:14:57.0)	69.7	82.0	77.4	73.3	62.9
Saturday, October 28, 2017	9:15	(0:14:57.0)	69.1	84.7	76.8	72.0	63.1
Saturday, October 28, 2017	9:30	(0:14:57.0)	69.9	90.9	78.0	72.5	63.0
Saturday, October 28, 2017	9:45	(0:14:58.0)	70.3	91.6	75.7	72.7	63.2
Saturday, October 28, 2017	10:00	(0:14:57.0)	69.4	82.7	77.3	72.7	63.0
Saturday, October 28, 2017	10:15	(0:14:57.0)	69.4	89.3	76.6	72.0	64.2
Saturday, October 28, 2017	10:30	(0:14:58.0)	69.6	87.7	77.0	72.1	62.6

Date	Start time	Duration	LAeq	LAFmax	LA1	LA10	LA90
Saturday, October 28, 2017	10:45	(0:14:57.0)	69.4	83.6	76.5	72.4	63.6
Saturday, October 28, 2017	11:00	(0:14:57.0)	71.8	91.9	82.9	72.9	63.0
Saturday, October 28, 2017	11:15	(0:14:56.0)	70.3	98.3	77.6	72.6	63.9
Saturday, October 28, 2017	11:30	(0:14:57.0)	69.6	87.1	77.9	72.4	62.9
Saturday, October 28, 2017	11:45	(0:14:58.0)	69.4	79.8	76.7	72.6	62.2
Saturday, October 28, 2017	12:00	(0:14:57.0)	69.1	84.5	76.1	72.0	62.8
Saturday, October 28, 2017	12:15	(0:14:57.0)	69.9	88.6	77.1	72.5	60.9
Saturday, October 28, 2017	12:30	(0:14:57.0)	69.5	87.2	77.6	72.1	62.5
Saturday, October 28, 2017	12:45	(0:14:57.0)	69.9	88.7	77.8	72.5	62.5
Saturday, October 28, 2017	13:00	(0:14:56.0)	69.4	82.9	76.0	72.7	61.2
Saturday, October 28, 2017	13:15	(0:14:57.0)	68.8	82.3	74.7	72.2	61.0
Saturday, October 28, 2017	13:30	(0:14:57.0)	69.2	83.6	77.1	72.2	62.8
Saturday, October 28, 2017	13:45	(0:14:57.0)	69.5	82.1	77.0	72.7	63.4
Saturday, October 28, 2017	14:00	(0:14:57.0)	69.4	87.4	76.4	72.5	62.8
Saturday, October 28, 2017	14:15	(0:14:58.0)	69.8	86.9	78.2	73.0	61.7
Saturday, October 28, 2017	14:30	(0:14:58.0)	70.1	87.1	79.3	72.4	62.5
Saturday, October 28, 2017	14:45	(0:14:58.0)	70.0	89.3	78.5	72.2	63.6
Saturday, October 28, 2017	15:00	(0:14:57.0)	69.2	83.2	76.5	72.2	63.4
Saturday, October 28, 2017	15:15	(0:14:58.0)	71.3	95.3	78.7	72.4	63.1
Saturday, October 28, 2017	15:30	(0:14:57.0)	68.6	79.0	75.2	71.8	62.7
Saturday, October 28, 2017	15:45	(0:14:58.0)	68.5	80.8	75.8	71.6	62.1
Saturday, October 28, 2017	16:00	(0:14:57.0)	69.5	87.5	76.7	72.3	62.9
Saturday, October 28, 2017	16:15	(0:14:57.0)	70.1	97.4	77.1	72.3	61.3
Saturday, October 28, 2017	16:30	(0:14:57.0)	69.9	86.6	79.3	72.5	62.8
Saturday, October 28, 2017	16:45	(0:14:57.0)	69.8	88.3	78.4	72.1	59.9
Saturday, October 28, 2017	17:00	(0:14:57.0)	68.1	83.1	75.8	71.6	59.6
Saturday, October 28, 2017	17:15	(0:14:57.0)	68.0	82.5	76.0	71.6	58.9
Saturday, October 28, 2017	17:30	(0:14:57.0)	69.4	97.2	78.3	71.7	58.2
Saturday, October 28, 2017	17:45	(0:14:56.0)	67.3	97.5	73.8	70.1	59.0
Saturday, October 28, 2017	18:00	(0:14:56.0)	69.8	93.9	77.9	71.5	58.4
Saturday, October 28, 2017	18:15	(0:14:57.0)	67.5	82.3	75.1	71.4	58.1
Saturday, October 28, 2017	18:30	(0:14:57.0)	74.9	99.6	82.4	71.7	57.5
Saturday, October 28, 2017	18:45	(0:14:55.0)	67.1	82.3	76.6	70.4	58.2
Saturday, October 28, 2017	19:00	(0:14:57.0)	69.4	98.0	77.2	71.6	59.4
Saturday, October 28, 2017	19:15	(0:14:57.0)	70.0	90.8	81.7	71.7	60.5
Saturday, October 28, 2017	19:30	(0:14:57.0)	69.0	85.4	78.7	72.1	60.0
Saturday, October 28, 2017	19:45	(0:14:57.0)	73.2	100.9	85.0	73.1	61.0
Saturday, October 28, 2017	20:00	(0:14:57.0)	69.1	88.1	79.8	71.8	60.9
Saturday, October 28, 2017	20:15	(0:14:57.0)	68.3	84.6	77.0	71.5	61.1
Saturday, October 28, 2017	20:30	(0:14:57.0)	66.8	82.8	74.0	70.3	58.8
Saturday, October 28, 2017	20:45	(0:14:57.0)	67.3	83.0	75.6	70.6	60.1
Saturday, October 28, 2017	21:00	(0:14:57.0)	67.1	84.8	75.6	70.2	60.1
Saturday, October 28, 2017	21:15	(0:14:56.0)	68.5	88.9	77.6	70.7	61.6
Saturday, October 28, 2017	21:30	(0:14:57.0)	69.5	88.6	77.9	72.0	63.1
Saturday, October 28, 2017	21:45	(0:14:57.0)	70.6	89.8	81.0	72.6	63.9
Saturday, October 28, 2017	22:00	(0:14:58.0)	69.4	84.1	76.7	72.1	64.2
Saturday, October 28, 2017	22:15	(0:14:57.0)	68.0	80.5	75.2	71.1	62.6
Saturday, October 28, 2017	22:30	(0:14:57.0)	70.2	87.6	80.4	72.5	64.2
Saturday, October 28, 2017	22:45	(0:14:57.0)	69.7	87.4	79.4	71.8	63.3
Saturday, October 28, 2017	23:00	(0:14:58.0)	70.2	91.7	79.6	73.1	62.4
Saturday, October 28, 2017	23:15	(0:14:57.0)	71.4	97.2	82.6	71.1	61.8
Saturday, October 28, 2017	23:30	(0:14:57.0)	71.3	95.9	80.6	71.0	62.5
Saturday, October 28, 2017	23:45	(0:14:57.0)	68.4	83.1	78.2	71.6	60.9
Sunday, October 29, 2017		(0:14:57.0)	67.7	82.4	77.0	71.1	60.3
Sunday, October 29, 2017		(0:14:58.0)	67.2	80.4	76.6	70.4	60.1
Sunday, October 29, 2017		(0:14:58.0)	65.2	77.9	74.2	69.5	55.8
Sunday, October 29, 2017		(0:14:58.0)	65.9	81.4	73.9	69.7	57.5
Sunday, October 29, 2017	0:00	(0:14:58.0)	65.2	81.2	74.6	69.3	55.9
Sunday, October 29, 2017	0:15	(0:14:58.0)	66.8	85.3	76.7	70.3	56.2
Sunday, October 29, 2017	0:30	(0:14:58.0)	65.3	79.9	74.0	69.6	55.2
Sunday, October 29, 2017	0:45	(0:14:58.0)	66.0	81.3	75.6	70.0	53.9
Sunday, October 29, 2017	1:00	(0:14:58.0)	65.0	81.1	75.3	69.1	54.2
Sunday, October 29, 2017	1:15	(0:14:58.0)	63.2	81.3	72.4	67.8	50.0
Sunday, October 29, 2017	1:30	(0:14:58.0)	63.4	78.7	73.0	68.0	50.4
Sunday, October 29, 2017	1:45	(0:14:58.0)	63.9	84.9	74.8	67.4	50.3
Sunday, October 29, 2017	2:00	(0:14:57.0)	65.0	82.9	76.7	68.6	47.4
Sunday, October 29, 2017	2:15	(0:14:57.0)	63.6	83.0	74.5	67.1	47.6
Sunday, October 29, 2017	2:30	(0:14:57.0)	62.3	76.3	73.0	66.9	45.7
Sunday, October 29, 2017	2:45	(0:14:58.0)	61.8	77.0	73.1	65.7	46.4
Sunday, October 29, 2017	3:00	(0:14:56.0)	60.9	79.8	71.5	64.5	45.9
Sunday, October 29, 2017	3:15	(0:14:57.0)	63.5	83.2	74.6	67.2	44.3
Sunday, October 29, 2017	3:30	(0:14:58.0)	60.4	76.7	72.1	64.4	42.6
Sunday, October 29, 2017	3:45	(0:14:58.0)	60.8	74.3	71.5	66.1	42.1
Sunday, October 29, 2017	4:00	(0:14:58.0)	69.9	77.2	74.4	72.2	44.2
Sunday, October 29, 2017	4:15	(0:14:58.0)	69.3	85.3	77.3	72.2	47.0
Sunday, October 29, 2017	4:30	(0:14:58.0)	59.0	77.0	71.3	62.1	39.6
Sunday, October 29, 2017	4:45	(0:14:57.0)	59.4	73.6	71.1	63.9	39.3
Sunday, October 29, 2017	5:00	(0:14:57.0)	60.9	81.4	72.5	63.8	40.3
Sunday, October 29, 2017	5:15	(0:14:58.0)	60.4	82.3	71.5	63.3	41.1
Sunday, October 29, 2017	5:30	(0:14:58.0)	63.3	87.0	74.9	66.1	41.9
Sunday, October 29, 2017	5:45	(0:14:58.0)	58.7	79.7	70.1	61.2	39.4
Sunday, October 29, 2017	6:00	(0:14:58.0)	58.7	76.9	71.8	60.4	40.1
Sunday, October 29, 2017	6:15	(0:14:58.0)	68.1	86.5	81.7	68.6	43.0
Sunday, October 29, 2017	6:30	(0:14:57.0)	60.9	81.2	72.4	63.7	40.9
Sunday, October 29, 2017	6:45	(0:14:57.0)	61.8	74.9	72.1	66.7	42.8
Sunday, October 29, 2017	7:00	(0:14:57.0)	62.3	81.3	72.9	65.7	44.2
Sunday, October 29, 2017	7:15	(0:14:58.0)	62.9	79.1	74.1	66.4	48.1
Sunday, October 29, 2017	7:30	(0:14:58.0)	63.5	87.7	74.8	66.5	46.8
Sunday, October 29, 2017	7:45	(0:14:58.0)	63.3	78.5	73.7	67.4	48.7
Sunday, October 29, 2017	8:00	(0:14:57.0)	64.5	78.6	73.3	67.4	58.1
Sunday, October 29, 2017	8:15	(0:14:58.0)	66.3	80.3	74.9	70.0	60.3
Sunday, October 29, 2017	8:30	(0:14:58.0)	66.7	85.9	76.0	68.6	60.2
Sunday, October 29, 2017	8:45	(0:14:58.0)	66.6	82.3	74.8	69.9	60.8
Sunday, October 29, 2017	9:00	(0:14:58.0)	68.3	82.6	78.3	71.5	61.3
Sunday, October 29, 2017	9:15	(0:14:58.0)	66.6	83.8	73.7	70.2	61.2
Sunday, October 29, 2017	9:30	(0:14:57.0)	67.5	83.8	75.1	71.2	61.3
Sunday, October 29, 2017	9:45	(0:14:58.0)	67.8	84.0	75.0	71.4	61.4
Sunday, October 29, 2017	10:00	(0:14:55.0)	67.5	76.5	74.3	71.6	61.8
Sunday, October 29, 2017	10:15	(0:14:57.0)	68.6	83.7	77.1	72.2	61.7

Date	Start time	Duration	LAeq	LAFmax	LA1	LA10	LA90
Sunday, October 29, 2017	10:30	(0:14:58.0)	67.5	77.6	74.3	71.3	61.7
Sunday, October 29, 2017	10:45	(0:14:57.0)	68.6	84.8	75.8	71.6	62.5
Sunday, October 29, 2017	11:00	(0:14:58.0)	68.1	81.5	75.4	71.7	61.5
Sunday, October 29, 2017	11:15	(0:14:58.0)	67.7	77.4	74.2	71.4	61.5
Sunday, October 29, 2017	11:30	(0:14:57.0)	68.8	87.6	75.8	71.8	62.5
Sunday, October 29, 2017	11:45	(0:14:57.0)	73.8	97.8	84.1	71.6	62.1
Sunday, October 29, 2017	12:00	(0:14:57.0)	68.8	85.0	75.8	72.4	62.4
Sunday, October 29, 2017	12:15	(0:14:58.0)	69.5	88.8	78.5	72.4	62.5
Sunday, October 29, 2017	12:30	(0:14:58.0)	68.3	79.6	75.4	71.8	62.8
Sunday, October 29, 2017	12:45	(0:14:57.0)	67.8	80.2	74.6	71.5	62.3
Sunday, October 29, 2017	13:00	(0:14:58.0)	68.6	81.0	76.1	71.8	62.3
Sunday, October 29, 2017	13:15	(0:14:57.0)	67.8	78.1	74.6	71.6	62.2
Sunday, October 29, 2017	13:30	(0:14:57.0)	69.8	90.2	80.1	71.8	62.2
Sunday, October 29, 2017	13:45	(0:14:57.0)	68.0	79.6	75.2	71.6	62.0
Sunday, October 29, 2017	14:00	(0:14:58.0)	68.8	82.0	75.5	72.0	62.6
Sunday, October 29, 2017	14:15	(0:14:57.0)	68.3	78.2	74.5	71.7	62.8
Sunday, October 29, 2017	14:30	(0:14:57.0)	68.4	86.3	77.6	71.3	61.8
Sunday, October 29, 2017	14:45	(0:14:57.0)	67.8	84.5	74.1	71.2	62.5
Sunday, October 29, 2017	15:00	(0:14:57.0)	67.6	79.6	75.0	71.1	62.1
Sunday, October 29, 2017	15:15	(0:14:57.0)	67.9	79.2	75.0	71.3	62.3
Sunday, October 29, 2017	15:30	(0:14:58.0)	68.1	78.8	75.8	72.0	62.1
Sunday, October 29, 2017	15:45	(0:14:57.0)	68.0	81.1	74.8	71.3	62.8
Sunday, October 29, 2017	16:00	(0:14:57.0)	67.9	82.9	75.6	71.7	58.2
Sunday, October 29, 2017	16:15	(0:14:57.0)	67.4	84.4	76.0	71.2	56.8
Sunday, October 29, 2017	16:30	(0:14:57.0)	67.5	83.8	77.8	71.5	55.3
Sunday, October 29, 2017	16:45	(0:14:57.0)	65.8	77.6	74.7	70.5	53.4
Sunday, October 29, 2017	17:00	(0:14:57.0)	65.9	76.5	74.5	69.9	56.2
Sunday, October 29, 2017	17:15	(0:14:57.0)	66.7	82.4	75.2	70.5	55.4
Sunday, October 29, 2017	17:30	(0:14:57.0)	66.3	80.8	74.7	70.4	55.7
Sunday, October 29, 2017	17:45	(0:14:58.0)	64.8	75.8	73.7	69.1	54.0
Sunday, October 29, 2017	18:00	(0:14:57.0)	66.4	79.0	75.4	70.4	56.0
Sunday, October 29, 2017	18:15	(0:14:57.0)	67.4	81.8	76.7	71.4	55.3
Sunday, October 29, 2017	18:30	(0:14:57.0)	69.3	92.3	78.3	71.8	54.6
Sunday, October 29, 2017	18:45	(0:14:58.0)	69.4	89.9	81.1	70.8	56.0
Sunday, October 29, 2017	19:00	(0:14:57.0)	66.8	83.5	75.7	71.0	53.7
Sunday, October 29, 2017	19:15	(0:14:57.0)	66.0	78.7	74.9	70.4	54.1
Sunday, October 29, 2017	19:30	(0:14:57.0)	65.6	83.0	75.4	69.9	52.6
Sunday, October 29, 2017	19:45	(0:14:57.0)	66.6	84.0	75.5	70.5	55.7
Sunday, October 29, 2017	20:00	(0:14:58.0)	65.7	87.3	76.2	69.3	47.7
Sunday, October 29, 2017	20:15	(0:14:57.0)	66.7	87.0	77.7	71.2	49.2
Sunday, October 29, 2017	20:30	(0:14:57.0)	65.4	80.4	75.4	69.9	51.4
Sunday, October 29, 2017	20:45	(0:14:57.0)	65.2	86.0	74.2	68.8	51.8
Sunday, October 29, 2017	21:00	(0:14:57.0)	63.5	82.3	74.0	67.4	51.8
Sunday, October 29, 2017	21:15	(0:14:58.0)	65.1	80.5	75.5	69.2	52.3
Sunday, October 29, 2017	21:30	(0:14:57.0)	63.6	81.0	73.6	68.2	50.1
Sunday, October 29, 2017	21:45	(0:14:57.0)	65.2	84.6	77.4	68.6	49.7
Sunday, October 29, 2017	22:00	(0:14:57.0)	62.8	78.5	73.6	66.3	48.0
Sunday, October 29, 2017	22:15	(0:14:57.0)	62.0	76.2	71.9	66.1	45.5
Sunday, October 29, 2017	22:30	(0:14:58.0)	62.2	77.4	73.8	66.0	42.8
Sunday, October 29, 2017	22:45	(0:14:57.0)	62.7	76.4	73.5	66.7	45.4
Sunday, October 29, 2017	23:00	(0:14:57.0)	63.4	83.9	74.4	66.7	43.5
Sunday, October 29, 2017	23:15	(0:14:57.0)	60.6	77.1	72.4	64.6	41.6
Sunday, October 29, 2017	23:30	(0:14:57.0)	59.6	75.3	71.1	63.3	41.3
Sunday, October 29, 2017	23:45	(0:14:58.0)	62.7	78.4	74.5	66.7	41.5
Monday, October 30, 2017	0:00	(0:14:58.0)	61.8	81.5	75.6	62.2	40.2
Monday, October 30, 2017	0:15	(0:14:58.0)	63.7	86.5	73.6	61.3	39.5
Monday, October 30, 2017	0:30	(0:14:58.0)	59.4	82.3	72.5	57.4	38.3
Monday, October 30, 2017	0:45	(0:14:58.0)	55.9	76.3	70.1	55.3	39.0
Monday, October 30, 2017	1:00	(0:14:58.0)	60.6	81.7	73.3	60.8	40.5
Monday, October 30, 2017	1:15	(0:14:58.0)	57.6	76.4	72.2	57.4	38.7
Monday, October 30, 2017	1:30	(0:14:58.0)	56.8	74.9	69.8	58.5	39.0
Monday, October 30, 2017	1:45	(0:14:58.0)	55.1	73.1	68.5	57.2	38.4
Monday, October 30, 2017	2:00	(0:14:58.0)	59.1	80.9	72.3	58.4	37.4
Monday, October 30, 2017	2:15	(0:14:57.0)	59.4	79.8	74.5	58.0	37.1
Monday, October 30, 2017	2:30	(0:14:58.0)	53.1	71.1	66.6	54.9	36.9
Monday, October 30, 2017	2:45	(0:14:58.0)	50.3	71.2	63.1	50.4	37.3
Monday, October 30, 2017	3:00	(0:14:58.0)	51.3	72.8	64.0	52.3	38.4
Monday, October 30, 2017	3:15	(0:14:58.0)	55.9	79.5	69.3	48.6	39.0
Monday, October 30, 2017	3:30	(0:14:58.0)	51.8	73.9	64.1	51.4	39.2
Monday, October 30, 2017	3:45	(0:14:58.0)	52.6	74.4	65.2	52.9	37.6
Monday, October 30, 2017	4:00	(0:14:57.0)	50.7	69.6	63.1	53.1	38.0
Monday, October 30, 2017	4:15	(0:14:57.0)	62.4	76.1	72.8	68.7	39.2
Monday, October 30, 2017	4:30	(0:14:57.0)	71.1	79.7	75.9	71.9	70.1
Monday, October 30, 2017	4:45	(0:14:57.0)	58.6	77.2	72.5	58.1	39.4
Monday, October 30, 2017	5:00	(0:14:57.0)	59.7	75.2	71.7	63.2	41.3
Monday, October 30, 2017	5:15	(0:14:57.0)	62.9	80.8	74.4	66.5	44.3
Monday, October 30, 2017	5:30	(0:14:56.0)	63.2	78.3	74.2	67.8	45.0
Monday, October 30, 2017	5:45	(0:14:56.0)	62.3	77.9	73.5	65.4	46.9
Monday, October 30, 2017	6:00	(0:14:56.0)	67.9	90.0	78.9	69.1	44.9
Monday, October 30, 2017	6:15	(0:14:57.0)	67.4	88.7	78.6	71.4	48.1
Monday, October 30, 2017	6:30	(0:14:57.0)	66.1	82.8	77.6	69.8	48.6
Monday, October 30, 2017	6:45	(0:14:57.0)	67.0	85.6	78.1	70.6	52.9
Monday, October 30, 2017	7:00	(0:14:57.0)	68.3	83.2	77.7	71.7	60.9
Monday, October 30, 2017	7:15	(0:14:57.0)	69.3	81.3	78.2	72.7	63.2
Monday, October 30, 2017	7:30	(0:14:57.0)	69.0	82.0	76.5	72.8	62.7
Monday, October 30, 2017	7:45	(0:14:57.0)	69.6	85.6	77.1	73.1	62.9
Monday, October 30, 2017	8:00	(0:14:57.0)	71.0	91.0	77.2	74.0	63.6
Monday, October 30, 2017	8:15	(0:14:56.0)	71.1	88.3	80.3	74.0	64.0
Monday, October 30, 2017	8:30	(0:14:56.0)	69.5	82.5	77.0	72.9	63.5
Monday, October 30, 2017	8:45	(0:14:57.0)	69.6	83.0	78.2	72.7	63.6
Monday, October 30, 2017	9:00	(0:14:57.0)	69.2	82.1	77.8	72.5	62.8
Monday, October 30, 2017	9:15	(0:14:57.0)	69.9	82.1	77.5	73.3	63.8
Monday, October 30, 2017	9:30	(0:14:57.0)	69.9	90.0	76.4	72.8	63.3
Monday, October 30, 2017	9:45	(0:14:57.0)	69.5	86.4	77.1	72.5	62.2
Monday, October 30, 2017	10:00	(0:14:57.0)	70.1	84.0	76.9	73.1	64.3
Monday, October 30, 2017	10:15	(0:14:57.0)	69.6	82.1	76.1	72.8	63.4
Monday, October 30, 2017	10:30	(0:14:57.0)	70.4	87.2	78.1	73.2	63.5
Monday, October 30, 2017	10:45	(0:14:56.0)	70.2	91.5	76.7	72.6	64.2
Monday, October 30, 2017	11:00	(0:14:57.0)	69.6	82.3	76.0	72.8	63.8
Monday, October 30, 2017	11:15	(0:14:57.0)	72.0	97.6	82.9	73.1	62.9

Date	Start time	Duration	LAeq	LAFmax	LA1	LA10	LA90
Monday, October 30, 2017	11:30	(0:14:57.0)	69.6	81.6	77.0	72.6	63.9
Monday, October 30, 2017	11:45	(0:14:57.0)	69.6	82.1	76.7	72.5	64.0
Monday, October 30, 2017	12:00	(0:14:57.0)	69.2	81.4	76.7	72.3	63.3
Monday, October 30, 2017	12:15	(0:14:57.0)	68.7	85.6	75.3	72.0	63.4
Monday, October 30, 2017	12:30	(0:14:57.0)	69.7	84.2	77.0	72.7	64.1
Monday, October 30, 2017	12:45	(0:14:57.0)	69.3	85.0	76.5	72.5	63.4
Monday, October 30, 2017	13:00	(0:14:57.0)	69.3	83.7	76.5	72.3	63.3
Monday, October 30, 2017	13:15	(0:14:57.0)	69.1	85.8	77.0	71.9	62.8
Monday, October 30, 2017	13:30	(0:14:57.0)	69.3	82.6	76.1	72.4	63.5
Monday, October 30, 2017	13:45	(0:14:57.0)	69.5	83.2	76.7	72.6	63.6
Monday, October 30, 2017	14:00	(0:14:57.0)	69.5	82.3	76.8	72.5	64.1
Monday, October 30, 2017	14:15	(0:14:57.0)	69.6	79.7	76.7	72.9	63.9
Monday, October 30, 2017	14:30	(0:14:57.0)	69.1	81.9	76.2	72.4	63.3
Monday, October 30, 2017	14:45	(0:14:57.0)	69.0	83.2	75.6	72.2	63.0
Monday, October 30, 2017	15:00	(0:14:57.0)	69.6	86.1	76.2	72.3	64.1
Monday, October 30, 2017	15:15	(0:14:57.0)	69.0	80.3	76.1	72.4	63.1
Monday, October 30, 2017	15:30	(0:14:57.0)	69.8	87.0	77.4	72.8	63.7
Monday, October 30, 2017	15:45	(0:14:57.0)	73.6	98.4	78.5	72.7	63.2
Monday, October 30, 2017	16:00	(0:14:56.0)	80.3	106.8	87.3	73.1	63.7
Monday, October 30, 2017	16:15	(0:14:56.0)	69.5	83.0	76.5	72.6	64.0
Monday, October 30, 2017	16:30	(0:14:55.0)	69.6	81.5	77.1	72.9	64.0
Monday, October 30, 2017	16:45	(0:14:57.0)	69.4	82.8	76.1	72.2	64.1
Monday, October 30, 2017	17:00	(0:14:57.0)	68.2	76.4	74.2	71.6	61.0
Monday, October 30, 2017	17:15	(0:14:57.0)	69.2	87.8	76.1	72.2	59.8
Monday, October 30, 2017	17:30	(0:14:58.0)	69.2	84.0	77.3	72.4	59.9
Monday, October 30, 2017	17:45	(0:14:56.0)	67.3	81.4	75.1	71.3	57.0
Monday, October 30, 2017	18:00	(0:14:57.0)	68.7	83.6	77.6	72.2	58.5
Monday, October 30, 2017	18:15	(0:14:57.0)	68.8	88.6	77.6	71.8	57.7
Monday, October 30, 2017	18:30	(0:14:57.0)	67.8	80.2	76.2	72.1	57.2
Monday, October 30, 2017	18:45	(0:14:57.0)	69.3	93.1	79.0	71.6	56.9
Monday, October 30, 2017	19:00	(0:14:57.0)	67.5	78.4	75.0	71.7	57.9
Monday, October 30, 2017	19:15	(0:14:57.0)	67.8	86.4	75.2	71.3	57.0
Monday, October 30, 2017	19:30	(0:14:57.0)	68.7	91.7	79.0	71.5	54.2
Monday, October 30, 2017	19:45	(0:14:57.0)	66.5	81.7	77.2	69.9	55.3
Monday, October 30, 2017	20:00	(0:14:57.0)	66.4	80.5	75.9	70.8	53.6
Monday, October 30, 2017	20:15	(0:14:57.0)	68.0	94.3	76.2	70.1	53.5
Monday, October 30, 2017	20:30	(0:14:56.0)	66.6	84.6	75.4	70.8	53.2
Monday, October 30, 2017	20:45	(0:14:57.0)	65.2	81.8	75.1	69.6	50.6
Monday, October 30, 2017	21:00	(0:14:58.0)	63.4	79.0	74.2	67.0	48.6
Monday, October 30, 2017	21:15	(0:14:57.0)	64.8	86.4	75.5	67.6	48.8
Monday, October 30, 2017	21:30	(0:14:58.0)	67.7	82.2	76.6	71.7	49.2
Monday, October 30, 2017	21:45	(0:14:58.0)	70.6	79.7	75.8	72.4	55.8
Monday, October 30, 2017	22:00	(0:14:58.0)	65.5	86.2	74.9	69.1	48.9
Monday, October 30, 2017	22:15	(0:14:58.0)	63.3	85.5	73.2	67.1	48.4
Monday, October 30, 2017	22:30	(0:14:57.0)	63.1	80.5	75.2	65.7	44.0
Monday, October 30, 2017	22:45	(0:14:57.0)	62.8	80.3	75.4	65.4	44.6
Monday, October 30, 2017	23:00	(0:14:57.0)	62.3	84.1	74.6	64.2	41.3
Monday, October 30, 2017	23:15	(0:14:58.0)	60.3	77.8	71.6	64.7	40.3
Monday, October 30, 2017	23:30	(0:14:58.0)	59.1	73.5	70.5	62.8	40.0
Monday, October 30, 2017	23:45	(0:14:58.0)	58.3	77.9	70.7	59.8	38.6
Tuesday, October 31, 2017	0:00	(0:14:58.0)	62.5	85.0	75.8	60.6	41.3
Tuesday, October 31, 2017	0:15	(0:14:58.0)	59.9	80.0	73.5	61.1	39.7
Tuesday, October 31, 2017	0:30	(0:14:58.0)	56.2	74.8	69.4	58.4	39.9
Tuesday, October 31, 2017	0:45	(0:14:58.0)	53.8	73.0	67.5	55.2	37.8
Tuesday, October 31, 2017	1:00	(0:14:58.0)	58.8	82.2	72.2	51.1	36.0
Tuesday, October 31, 2017	1:15	(0:14:58.0)	52.3	75.2	62.6	50.9	35.7
Tuesday, October 31, 2017	1:30	(0:14:58.0)	51.8	71.9	67.7	42.4	35.6
Tuesday, October 31, 2017	1:45	(0:14:58.0)	51.1	71.9	66.5	42.9	37.6
Tuesday, October 31, 2017	2:00	(0:14:58.0)	50.6	75.6	62.9	43.2	37.8
Tuesday, October 31, 2017	2:15	(0:14:58.0)	58.3	81.9	69.6	57.4	38.1
Tuesday, October 31, 2017	2:30	(0:14:58.0)	47.1	69.4	58.2	43.9	37.3
Tuesday, October 31, 2017	2:45	(0:14:58.0)	50.7	73.6	62.3	50.1	36.5
Tuesday, October 31, 2017	3:00	(0:14:58.0)	53.9	75.6	68.0	53.6	37.5
Tuesday, October 31, 2017	3:15	(0:14:58.0)	52.2	72.3	65.6	50.4	38.2
Tuesday, October 31, 2017	3:30	(0:14:58.0)	47.7	67.4	61.7	41.8	38.1
Tuesday, October 31, 2017	3:45	(0:14:58.0)	50.5	71.9	62.5	48.9	39.6
Tuesday, October 31, 2017	4:00	(0:14:57.0)	51.1	69.4	64.8	53.5	38.9
Tuesday, October 31, 2017	4:15	(0:14:58.0)	55.5	74.3	68.7	56.0	40.1
Tuesday, October 31, 2017	4:30	(0:14:58.0)	54.0	75.2	67.7	49.9	39.9
Tuesday, October 31, 2017	4:45	(0:14:56.0)	55.0	74.5	68.0	57.4	40.8
Tuesday, October 31, 2017	5:00	(0:14:58.0)	58.7	77.7	71.5	61.5	41.6
Tuesday, October 31, 2017	5:15	(0:14:57.0)	61.9	74.8	72.7	66.3	46.1
Tuesday, October 31, 2017	5:30	(0:14:58.0)	63.0	77.0	73.7	67.0	46.1
Tuesday, October 31, 2017	5:45	(0:14:57.0)	63.2	78.7	73.8	67.6	48.1
Tuesday, October 31, 2017	6:00	(0:14:58.0)	73.2	100.1	82.2	68.2	48.8
Tuesday, October 31, 2017	6:15	(0:14:57.0)	68.1	85.9	80.5	71.6	49.4
Tuesday, October 31, 2017	6:30	(0:14:57.0)	66.3	84.6	78.2	68.7	52.7
Tuesday, October 31, 2017	6:45	(0:14:58.0)	67.7	86.1	79.1	70.9	54.9
Tuesday, October 31, 2017	7:00	(0:14:58.0)	67.9	89.4	76.9	71.1	56.8
Tuesday, October 31, 2017	7:15	(0:14:57.0)	67.8	81.1	76.4	71.8	58.4
Tuesday, October 31, 2017	7:30	(0:14:58.0)	70.0	89.9	79.3	73.0	59.8
Tuesday, October 31, 2017	7:45	(0:14:58.0)	69.0	82.5	76.9	73.4	58.5
Tuesday, October 31, 2017	8:00	(0:14:57.0)	69.5	80.8	76.0	73.1	63.5
Tuesday, October 31, 2017	8:15	(0:14:57.0)	69.9	81.1	77.6	73.4	63.6
Tuesday, October 31, 2017	8:30	(0:14:57.0)	70.6	84.9	79.2	73.9	64.2

Appendix B: Example facade noise calculations

Source Data

Free field at facade location

Input "0" if subsequent Rw values are not available

Description	63	125	250	500	1000	2000	4000	8000	un-weighted sound level (dB)	Weighted sound level (dBA)
Leq,16hour (freefield)	75	70	64	62	63.8	61	54.1	47.7	77.3	67.7
Leq,8hour (freefield)	69	66	60	57	56.9	56.6	48	41.3	71.7	62.2
Leq peak night (freefield)	73	70	63	61	60.4	56.7	51.6	46	75.7	64.8
LAMAX (freefield)	89	81	75	74	75.4	71.3	64.8	60.6	90.1	78.9

BS8233 - Calculation of external noise to rooms

Project: Shambles Street, Barnsley
Room: Residential

Room Specification			***Notes in input***
Width	4.0	metres	*Width of room*
Length	4.0	metres	*Length of room*
Height	3.0	metres	*Height of room*
Volume	48.0	metres^2	*Calculated volume of room*
Reverberation time	0.5	seconds	*Reverberation of room (BS8233)*
Equivalent absorption area(A)	15	(Sabine formula)	*Calculated equivalant absorption area (assumed sabine)*
Area of windows	12.0	metres^2	*Area of window*
Total facade area	12.0	metres^2	*Total area of external facade*
Reference absorption (Ao)	10.0	metres^2	*As stated in BS8233:1999*
Area of ceiling if roof is facade	0.0	metres^2	*Area of ceiling if exposed to external noise*
Constant (+0/3/6 dB)	3		*constant - K = +6 direct nornal incedence, K = 0 random incedance (normally K=+3) of typical noise propergation*
Number of vents	2		*number of vents in room*

Titles as described in BS8233

Ao	*10*	*Reference absorption (Ao)*
Sf	*12*	*Total facade area*
Swi	*12.0*	*Area of windows*
Sew	*0.0*	*Area of walls*
Srr	*0*	*Area of ceilings*
S	*12*	*Outside wall area*
A	*15*	*Equivalent absorption area(A)*
Sr	*0*	*Ceiling area*

	63	125	250	500	1000	2000	4000	8000	dB/dBA/Rw/Dn,e	
Sound pressure level (free field, dB)	75.5	70.4	63.5	62.4	63.8	61.0	54.1	47.7	77.3	*Leq,16hour (freefield)*
A weighting	-26	-16	-9	-3	0	1	1	0		
Sound pressure level (free field, dBA)	49	54	55	59	64	62	55	48	67.7	
Reduction value of Window, Rw	28	33	40	46	48	56	65	60	-	*6-12.6-100-6(lined)*
Reduction value of external wall, Rew	100	100	100	100	100	100	100	100	100.00	*Assumed no wall*
Reduction value of roof and ceiling, Rrr	100	100	100	100	100	100	100	100	100.00	*Assumed no wall*
Reduction value of vent, Dn,e	35	35	35	36	42	45	62	62	46(0;-2)	*Greenwood: AAB*
Reduction value of vent, Dn,e (number of vents included)	32	32	32	33	39	42	59	59		
Absorption in room - A	15	15	15	15	15	15	15	15		
	50.6	*42.4*	*33.4*	*30.8*	*26.6*	*20.4*	*-2.6*	*-7.2*		
	24.6	26.4	24.4	27.8	26.6	21.4	-1.6	-7.2	33.4	*dBA : Predicted noise level in room*

BS8233 - Calculation of external noise to rooms

Project: Shambles Street, Barnsley
Room: Residential

Room Specification			***Notes in input***
Width	4.0	metres	*Width of room*
Length	4.0	metres	*Length of room*
Height	3.0	metres	*Height of room*
Volume	48.0	metres^2	*Calculated volume of room*
Reverberation time	0.5	seconds	*Reverberation of room (BS8233)*
Equivalent absorption area(A)	15	(Sabine formula)	*Calculated equivalant absorption area (assumed sabine)*
Area of windows	12.0	metres^2	*Area of window*
Total facade area	12.0	metres^2	*Total area of external facade*
Reference absorption (Ao)	10.0	metres^2	*As stated in BS8233:1999*
Area of ceiling if roof is facade	0.0	metres^2	*Area of ceiling if exposed to external noise*
Constant (+0/3/6 dB)	3		*constant - K = +6 direct nornal incedence, K = 0 random incedance (normally K=+3) of typical noise propergation*
Number of vents	2		*number of vents in room*

Titles as described in BS8233

Ao	*10*	*Reference absorption (Ao)*
Sf	*12*	*Total facade area*
Swi	*12.0*	*Area of windows*
Sew	*0.0*	*Area of walls*
Srr	*0*	*Area of ceilings*
S	*12*	*Outside wall area*
A	*15*	*Equivalent absorption area(A)*
Sr	*0*	*Ceiling area*

	63	125	250	500	1000	2000	4000	8000	dB/dBA/Rw/Dn,e	
Sound pressure level (free field, dB)	73.5	70.0	62.7	60.7	60.4	56.7	51.6	46.0	75.7	*Leq peak night (freefield)*
A weighting	-26	-16	-9	-3	0	1	1	0		
Sound pressure level (free field, dBA)	47	54	54	58	60	58	53	46	64.8	
Reduction value of Window, Rw	28	33	40	46	48	56	65	60	-	*6-12.6-100-6(lined)*
Reduction value of external wall, Rew	100	100	100	100	100	100	100	100	100.00	*Assumed no wall*
Reduction value of roof and ceiling, Rrr	100	100	100	100	100	100	100	100	100.00	*Assumed no wall*
Reduction value of vent, Dn,e	35	35	35	36	42	45	62	62	46(0;-2)	*Greenwood: AAB*
Reduction value of vent, Dn,e (number of vents included)	32	32	32	33	39	42	59	59		
Absorption in room - A	15	15	15	15	15	15	15	15		
	48.6	*42.0*	*32.6*	*29.1*	*23.2*	*16.0*	*-5.1*	*-9.0*		
	22.6	26.0	23.6	26.1	23.2	17.0	-4.1	-9.0	31.7	*dBA : Predicted noise level in room*

BS8233 - Calculation of external noise to rooms

Project: Shambles Street, Barnsley
Room: Residential

Room Specification			***Notes in input***
Width	4.0	metres	*Width of room*
Length	4.0	metres	*Length of room*
Height	3.0	metres	*Height of room*
Volume	48.0	metres^2	*Calculated volume of room*
Reverberation time	0.5	seconds	*Reverberation of room (BS8233)*
Equivalent absorption area(A)	15	(Sabine formula)	*Calculated equivalant absorption area (assumed sabine)*
Area of windows	12.0	metres^2	*Area of window*
Total facade area	12.0	metres^2	*Total area of external facade*
Reference absorption (Ao)	10.0	metres^2	*As stated in BS8233:1999*
Area of ceiling if roof is facade	0.0	metres^2	*Area of ceiling if exposed to external noise*
Constant (+0/3/6 dB)	3		*constant - K = +6 direct nornal incedence, K = 0 random incedance (normally K=+3) of typical noise propergation*
Number of vents	2		*number of vents in room*

Titles as described in BS8233

Ao	*10*	*Reference absorption (Ao)*
Sf	*12*	*Total facade area*
Swi	*12.0*	*Area of windows*
Sew	*0.0*	*Area of walls*
Srr	*0*	*Area of ceilings*
S	*12*	*Outside wall area*
A	*15*	*Equivalent absorption area(A)*
Sr	*0*	*Ceiling area*

	63	125	250	500	1000	2000	4000	8000	dB/dBA/Rw/Dn,e	
Sound pressure level (free field, dB)	69.2	66.2	59.8	57.1	56.9	56.6	48.0	41.3	71.7	*Leq,8hour (freefield)*
A weighting	-26	-16	-9	-3	0	1	1	0		
Sound pressure level (free field, dBA)	43	50	51	54	57	58	49	41	62.2	
Reduction value of Window, Rw	28	33	40	46	48	56	65	60	-	*6-12.6-100-6(lined)*
Reduction value of external wall, Rew	100	100	100	100	100	100	100	100	100.00	*Assumed no wall*
Reduction value of roof and ceiling, Rrr	100	100	100	100	100	100	100	100	100.00	*Assumed no wall*
Reduction value of vent, Dn,e	35	35	35	36	42	45	62	62	46(0;-2)	*Greenwood: AAB*
Reduction value of vent, Dn,e (number of vents included)	32	32	32	33	39	42	59	59		
Absorption in room - A	15	15	15	15	15	15	15	15		
	44.4	*38.3*	*29.7*	*25.5*	*19.6*	*15.9*	*-8.7*	*-13.7*		
	18.4	22.3	20.7	22.5	19.6	16.9	-7.7	-13.7	28.3	*dBA : Predicted noise level in room*

BS8233 - Calculation of external noise to rooms

Project: Shambles Street, Barnsley
Room: Residential

Room Specification			***Notes in input***
Width	4.0	metres	*Width of room*
Length	4.0	metres	*Length of room*
Height	3.0	metres	*Height of room*
Volume	48.0	metres^2	*Calculated volume of room*
Reverberation time	0.5	seconds	*Reverberation of room (BS8233)*
Equivalent absorption area(A)	15	(Sabine formula)	*Calculated equivalant absorption area (assumed sabine)*
Area of windows	12.0	metres^2	*Area of window*
Total facade area	12.0	metres^2	*Total area of external facade*
Reference absorption (Ao)	10.0	metres^2	*As stated in BS8233:1999*
Area of ceiling if roof is facade	0.0	metres^2	*Area of ceiling if exposed to external noise*
Constant (+0/3/6 dB)	3		*constant - K = +6 direct nornal incedence, K = 0 random incedance (normally K=+3) of typical noise propergation*
Number of vents	2		*number of vents in room*

Titles as described in BS8233

Ao	*10*	*Reference absorption (Ao)*
Sf	*12*	*Total facade area*
Swi	*12.0*	*Area of windows*
Sew	*0.0*	*Area of walls*
Srr	*16*	*Area of ceilings*
S	*28*	*Outside wall area*
A	*15*	*Equivalent absorption area(A)*
Sr	*0*	*Ceiling area*

	63	125	250	500	1000	2000	4000	8000	dB/dBA/Rw/Dn,e	
Sound pressure level (free field, dB)	89.0	81.3	75.1	73.8	75.4	71.3	64.8	60.6	90.1	*LAMAX (freefield)*
A weighting	-26	-16	-9	-3	0	1	1	0		
Sound pressure level (free field, dBA)	63	65	66	71	75	72	66	61	**78.9**	
Reduction value of Window, Rw	28	33	40	46	48	56	65	60	-	*6-12.6-100-6(lined)*
Reduction value of external wall, Rew	100	100	100	100	100	100	100	100	100.00	*Assumed no wall*
Reduction value of roof and ceiling, Rrr	100	100	100	100	100	100	100	100	100.00	*Assumed no wall*
Reduction value of vent, Dn,e	35	35	35	36	42	45	62	62	46(0;-2)	*Greenwood: AAB*
Reduction value of vent, Dn,e (number of vents included)	32	32	32	33	39	42	59	59		
Absorption in room - A	15	15	15	15	15	15	15	15		
	64.1	*53.3*	*45.0*	*42.2*	*38.1*	*30.6*	*8.1*	*5.6*		
	38.1	37.3	36.0	39.2	38.1	31.6	9.1	5.6	45.1	*dBA : Predicted noise level in room*

Appendix C: Sound Insulation Test Report

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Yorkshire House, Shamble Street - Note

Noise assessment: sound insulation performance of existing floor separating the ground floor and 1st /2nd floor units directly over

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2 March 2018

1.0 Note

1.1 Sharps Gayler LLP (SGL) has been commissioned to undertake a sound insulation test at Yorkshire House, Shambles Street.

1.2 The original assessment (13th November 2017) established a sound reduction level (IL – insertion Loss) of 50dB or above. This was based on measurements undertaken at the floor level immediately above whilst the previous bar/night club use of the ground floor unit ("Soul Lounge") was operational. Since that time Soul Lounge has vacated the unit and the opportunity to test the sound insulation of the floor/ceiling structure was taken.

1.3 A high-level sound source was used in the ground floor unit and sound measurements were undertaken in the ground floor as the source room reverberant noise level. Also, sound measurements were undertaken in the receiver rooms at the floor level above. Therefore, the acoustic insulation of the floor/ceiling structure between the two areas can be calculated

1.4 The table below summarising the findings from the survey and the derived "Insertion Loss" which can be applied to the floor/ceiling structure.

Partition/Floor area	Sound Reduction Level (IL - dBA)
Dance floor and Room above 118	62.0
Dance floor and Room above 117	60.6
Dance floor and Hall above*	58.1
Bar area and Room above 116	60.2
Bar area and Room above 115	61.3
Bar area and Room above 114	62.7
Bar and Room above Room 132*	57.8
Bar and Room above Room 132*	58.3

**Road noise and larger receiver room – resultant noise levels have been corrected for background noise levels in the receiver rooms*

1.5 It can be seen that the acoustic performance of the partition varies between an IL of 58.1 to 62.7 dBA. The level varies because of the size of the receiver room and the joining partition size. The above IL has been log averaged to calculate an average IL equating to 60 dBA. This IL has been used in the following calculations.

1.6 Furthermore, the Insertion Loss in each frequency is shown in the table below. The dictating factor of the acoustic performance of the structure is the low frequencies (i.e. those associated with typical music noise with a significant bass content), so the mid and upper frequencies have been discounted.

Partition/Floor area	63 Hz (dB)	125 Hz (dB)	250 Hz (dB)	500 Hz(dB)
Dance floor and Room above 118	47.7	47.6	58.1	65.7
Dance floor and Room above 117	44.8	47.2	57.1	65.2

Dance floor and Hall above	42.3	45.4	55.0	61.5
Bar area and Room above 116	44.6	43.5	57.6	65.3
Bar area and Room above 115	46.5	46.5	57.5	66.0
Bar area and Room above 114	45.2	47.2	58.9	68.5
Bar and Room above Room 132*	39.1	42.7	53.0	61.7
Bar and Room above Room 132*	39.5	41.7	52.5	61.3
Log average	**44.6**	**45.7**	**56.7**	**65.0**

1.7 For future reference, the table below displays the recommended noise rating criterion in any receiver room (upper floor units), and the calculated source room noise limits (occupier of the ground floor units), that should not be exceeded by future tenants were the floor/ceiling structure to remain as it is and, on the assumption, that the upper floor units are converted to residential use.

Partition/Floor area	**63 Hz (dB)**	**125 Hz (dB)**	**250 Hz (dB)**	**500 Hz(dB)**
NR20	51	39	31	24
SRI of floor/ceiling	45	46	57	65
Ground floor unit - noise limits	**96**	**85**	**88**	**89**

1.8 In addition to the above, the overall reverberant noise level LAeqT (dB) limit in the unit below should not exceed LAeqT = 85 dB. This would result in a LAeqT = 25 dB in the units above (approximately NR20).

1.9 In our experience it is unlikely that "normal" restaurant activity with typical background music playing would exceed these levels. However, a typical pub/bar may need to introduce additional sound insulation to ensure compliance with the criteria in the units above. Any other commercial use (shop, office, café, hot food take way etc.) would not be likely to generate internal sound levels approaching 85 dBA in any circumstances