

Sunlight House Manchester

Noise Impact Assessment

Aberdeen Asset Management

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1.0

Introduction

1.0 Introduction

Proposals are for the change of use of a ground floor office space into a new café and/or bar (A3/A4 use class) at Sunlight House, central Manchester.

The unit is located in the former entrance on the corner of Little Quay Street and Atkinson Street.

It is understood the A3/A4 unit will potentially operate until 02:30 hours.

Cundall has been commissioned by Aberdeen Asset Management to assess the potential noise impact from the bar at nearby noise sensitive receptors (NSR).

The purpose of this report is:

- To document the survey methodology and the measured noise levels around the site;
- To set limiting plant noise levels in accordance with Local Authority noise policy;
- To calculate the potential noise impact of proposed services plant; and
- To carry out a quantitative assessment of noise break-out from internal activities.

2.0

Assessment criteria

2.0 Assessment criteria

This section of the report outlines the key legislation and guidance relevant to the assessment of noise for a development of this type.

2.1 National Planning Policy Framework

The National Planning Policy Framework (NPPF) was published in March 2012 and amended in 2019. The NPPF is part of government reform to make the planning system less complex and more accessible, and to promote sustainable growth. It replaces existing national planning policies such as Planning Policy Guidance PPG24: Planning and Noise.

The NPPF states:

“170 - 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. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans; [...]”

and

“180 - 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 life;

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; [...]”

and

“182 - 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.”

2.2 Planning Practice Guidance

In March 2014 Planning Practice Guidance for noise was published. This online document advises on how planning can manage potential noise impacts in new development.

2.3 BS 4142:2014

BS 4142:2014 provides methods for rating and assessing sound of an industrial and/or commercial nature, which includes sound from industrial and manufacturing processes, fixed services plant, sound generated by the loading/unloading of goods and sound from mobile plant / vehicles associated with industrial / commercial premises (e.g. fork-lift trucks).

Typically, the greater the difference between the background and rating level, the greater the magnitude of impact, although BS 4142 emphasises that this is highly context-specific.

As a guideline, BS 4142 states that:

- *A difference (between the background and rating level) of around +10 dB or more is likely to be indicative of significant adverse impact, depending on context*
- *A difference (between the background and rating level) of around +5 dB or more is likely to be indicative of adverse impact, depending on context*
- *The lower the rating level relative to the background level, the less likely it is that the specific sound will have an adverse impact*
- *Where the rating level does not exceed the background level, this is an indication that the specific sound will have a low impact, depending on context*

2.4 Local Authority noise policy guidance

2.4.1 Noise limits for externally mounted ancillary plant, equipment and servicing

Section 3.6.1.5.1 of the Manchester City Council (MCC) 'Planning & Noise - Technical Guidance' document (December 2015) relates to noise limits for building services plant and states:

Many of the noise complaints Environmental Health receive about noise from plant, equipment and machinery specifically concern the character of the noise emitted. Any noise assessment needs to consider not only the overall level of noise emitted but also its particular characteristics. The noise assessment should be based on BS 4142: 2014 and any application for fixed plant, equipment or machinery must demonstrate that:

Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

2.4.2 Noise limits for internal noise break-out

Section 3.6.1.2 of MCC's noise policy guidance presents the following noise criteria for internal noise break-out when measured at nearby noise-sensitive receptors that are structurally detached.

Entertainment noise (L_{Aeq}) should be controlled to 10dB below the background noise level (L_{A90}) without the entertainment noise present, in each octave band at the nearest noise sensitive location.

2.4.3 Previous application

The above conditions for entertainment noise were adopted in Condition 4 of an approved decision notice for a previous application which referred to potential A3 use only (Planning Ref: 119650/FO/2018).

3.0

Site context

3.0 Site context

The proposed A3/A4 unit will be located on the ground floor of the Sunlight House building in Central Manchester, in the location of the former entrance on the corner of Little Quay Street and Atkinson Street.

Proposals are for the unit to be serviced by a single heat recovery unit, with intake and extract louvres located on the façade overlooking Little Quay Street.

The site is bounded by Atkinson Street to the north, Little Quay Street to the east, Quay Street to the south and the adjoining Manchester Opera House building to the west.

The nearest existing noise-sensitive office receptor is at 196 Deansgate, directly opposite the proposed development on the façade overlooking Little Quay Street. This lies approximately 15 m to the east of the site. The nearest residential receptors are considerably further than this from the proposed development, understood to be located at the Artillery House, Byrom Street, approximately 150 m to the south west of the proposed development.

The surrounding area is primarily made up of commercial and office spaces. The rear elevation of the existing Manahatta bar is located on the opposite side of Little Quay Street to the front elevation of the proposed site. The opening hours for the Manahatta bar¹ are as follows:

- Sunday – Tuesday: 12pm - 12am
- Wednesday: 12pm - 1am
- Thursday: 12pm - 2am
- Friday – Saturday: 11am - 3am

The proposals also include an area for external seating outside of the A3/A4 unit. No music will be played in this area.

An aerial photograph indicating the Sunlight House ownership boundary (blue), proposed A4 bar unit location (red), nearest office facades (yellow) and the nearest residential noise-sensitive receptors (green) is presented in Figure 1 overleaf.

¹ Correct based on website information available at the time of writing

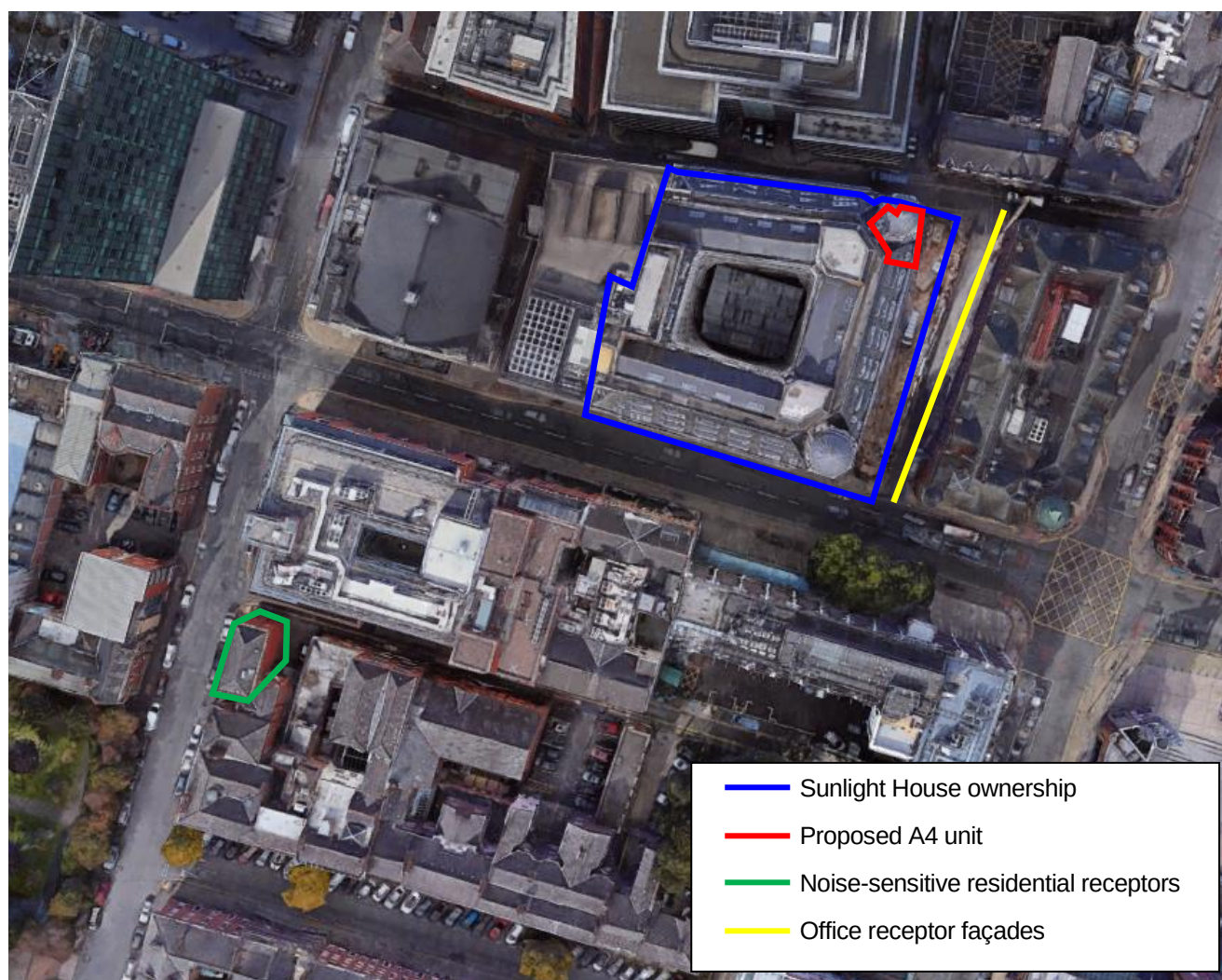


Figure 1 – Site and receptor locations

4.0

Environmental noise surveys

4.0 Environmental noise surveys

In order to assess the prevailing levels of environmental noise affecting the nearest noise-sensitive receptors, attended evening and night-time noise measurements have been undertaken. The timing of noise measurements is summarised in Table 1 below:

Position reference	Date	Period	Comments
MP1	7 November 2018	18:00 to 20:30 hours	This position was selected in order to establish representative background levels at the façade of 196 Deansgate facing Little Quay Street (i.e. the closest office receptor to the proposed A4 unit). Timing of measurements was chosen to be representative of late evening periods when the proposed bar may be busy and surrounding offices could still be occupied.
MP2	3 December 2019	01:30 to 02:30 hours	This position was selected in order to establish representative background levels at the nearest residential receptors at Artillery House apartments. Timing of measurements was chosen to be representative of late-night bar operations when surrounding background levels will be at their quietest. Measurements were undertaken on a Monday to be representative of a potential scenario whereby the proposed A4 is open until 2:30 am but the adjacent Manahatta bar has closed at 12:00 am

Table 1 – Noise measurement positions

The approximate measurement locations are shown in Figure 2 below.



Figure 2 – Approximate location of noise monitoring positions

The weather conditions during both surveys were calm and dry with wind speeds below 5 m/s.

Monitoring equipment was set up by competently trained Cundall staff and all measurement have been reported for free-field conditions.

Subjective impressions during the evening survey were that the noise climate was generally dictated by surrounding road traffic, mainly from Quay street, and by existing plant associated with 196 Deansgate.

During the night-time survey the noise climate was generally dictated by surrounding road traffic, mainly from Deansgate, with background levels dictated by plant noise audible on the rooftop of Direct Line House (located on the intersection of Quay Street and Byrom Street).

4.1 Summary

A summary of the average ambient noise levels recorded is detailed within Table 2. The values are the logarithmically averaged $L_{Aeq,15min}$, the maximum $L_{AFmax,15min}$ and the range of $L_{A90,15min}$ values measured. All values have been rounded to the nearest integer value (as fractions of a decibel are imperceptible) and are given in dBA.

Measurement position	Period	Average $L_{Aeq,15min}$ (dB)	Highest $L_{AFmax,15min}$ (dB)	Range $L_{A90,15min}$ (dB)
MP1	Late evening (18:00 – 20:15)	62	89	58 – 59
MP2	Night-time (01:30 – 02:30)	53	92* (77)	47 - 48
* L_{AFmax} value of 92 dB is attributable to car door slamming near the sound level meter. Value in parenthesis is the next highest L_{AFmax} value				

Table 2 – Noise measurement results

4.2 Discussion of results

It can be seen from Table 2 above that as would be generally expected levels were higher at position MP1 during evening hours than MP2 during night-time hours. In line with the subjective impressions of both positions with respect to items of plant significantly contributing to the background levels of the noise climate noise climate, the background noise levels $L_{A90,15min}$ were a narrow range for both positions during the time on site, reaching lows of 58 dB $L_{A90,15min}$ at position MP1 and 47 dB $L_{A90,15min}$ at position MP2.

5.0

Plant noise impact assessment

5.0 Plant noise impact assessment

5.1 Plant noise limiting criterion

To meet the requirements of MCC Planning Policy, sound rating levels ($L_{Ar,Tr}$) attributable to services plant associated with proposed building services plant should be designed to 5 dB below the existing background level (L_{A90}), when measured at 1 m from the nearest noise-sensitive receptors. This is based on the methodology set out in BS 4142, and is considered a positive indication that adverse effects will be avoided at nearby sensitive receptors.

Based on the measured prevailing background levels as detailed in Table 2, the following plant noise rating limits are proposed, which are not to be exceeded at 1 m from the façade of the noise sensitive receptors:

Period	Receptor	Lowest measured existing background level, dB	Cumulative limiting noise level for all items of building services plant, dB
Daytime and evening (07:00 – 23:00)	Office facades at little quay Street	58 $L_{A90,15min}$	53 $L_{Ar,1hour}$
Night-time (23:00 – 07:00)	Residential receptors at Artillery House	47 $L_{A90,15min}$	42 $L_{Ar,15min}$

Table 3 – Limiting plant noise levels

The above limiting levels apply to the cumulative sound level from all items of new building services plant when operating at their design duty.

5.2 Building services plant proposals

It is understood the only item of plant that is currently intended to be installed is a heat recovery unit, with louvres positioned on the external façade facing Little Quay Street. The model and relevant sound data is quoted as follows, with the manufacturer's datasheet reproduced in Appendix II of this report:

Item	Sound Pressure Level
Mitsubishi LGH-150RVXT-E	51 dBA @ 1.5 m

Table 4 – Manufacturer's plant noise data

It should be noted that the above value does not consider additional sound attenuation effects that will be provided by ductwork losses, end reflection losses, louvre losses etc.

Given that the sound pressure level at a distance of 1.5 m from the unit is already 2 dB below proposed limiting noise criterion at offices (53 dB $L_{Ar,1hour}$) at offices, it follows that plant noise levels will be significantly lower than existing background levels once the effects of distance attenuation are also taken into consideration.

For residential receptors at Artillery House, noise impacts associated with the heat recovery units will be completely inaudible.

6.0

Entertainment noise break-out assessment

6.0 Entertainment noise break-out assessment

6.1 Entertainment noise limiting criterion

To meet the requirements of MCC Planning Policy for entertainment noise, sound levels attributable to amplified music should be limited to 10 dB below the background noise level (L_{A90}) at nearby sensitive receptors.

Based on the measured prevailing background levels, the following noise limits are proposed which are not to be exceeded at 1 m from the façade of the noise sensitive receptors:

Receptor		Octave band centre frequency (Hz)						
		63	125	250	500	1k	2k	4k
Daytime & Evening (07:00 – 23:00)								
Offices at 196 Deansgate	Existing background level, dB	65	61	58	55	52	47	41
	MCC noise limits, dB	55	51	48	45	42	37	31
Night-time (23:00 – 23:00)								
Dwellings at Artillery House	Existing background level, dB	56	51	49	44	42	34	27
	MCC noise limits, dB	46	41	39	34	32	24	17

Table 5 – Limiting entertainment noise levels

6.2 Assumed internal levels and building fabric

In order to assess any potential adverse noise impact on nearby noise sensitive premises, an assessment of noise break-out from the proposed A3/A4 unit has been undertaken. To represent a robust worst-case scenario, library data of a busy bar playing amplified music at a level of 90 dBA has been used as the basis for the assessment. Given the relatively small size of the proposed unit and the probable 'high-end' café/bar tenant, this level is considered louder than is likely to occur.

	Octave band centre frequency (Hz)							A-weighted sound pressure level (dB)
	63	125	250	500	1k	2k	4k	
Assumed 'worst-case' sound pressure level within A4 unit	86	86	89	86	87	81	78	90 dBA

Table 6 – Assumed worst case A4 unit sound pressure levels

To assess the level of noise break-out from the bar, the sound attenuation provided by the external façade must be determined. The façade of the building is assumed to comprise brick and block external wall and standard double glazing, with the following sound reduction performances:

Element	Octave band centre frequency (Hz)							
	63*	125	250	500	1 K	2k	4 K	R _w
Brick and block external wall (as rated in BS 8233)	35*	40	44	45	51	56	60	50
6 mm / 6 to 20 mm / 4 mm double glazing** (as rated in BS 12354)	18*	21	20	26	38	37	39	32
*Values at 63Hz are not given in the respective standards quoted – values given are worst case expectations ** As the exact glazing specification of the existing windows is not known, a 6 /12/4 specification has been assumed as the worst-case probable build-up.								

Table 7 – Assumed sound reduction indices for façade elements

The relative contributions of these façade elements on the total composite sound reduction index has been calculated, taking into consideration the areas of each as a ratio of the total façade area. Architectural drawings for the external façade indicate approximately 26 m² of blockwork and 37 m² of glazing, giving a total façade area of approximately 63 m².

6.3 Noise impact at offices

In order to predict the sound level from the A4 unit at the nearest noise-sensitive office receptor during daytime and evening hours, a model has been produced using SoundPLAN 8.0 acoustic modelling software. This model is capable of accurately determining sound propagation, by taking into account variations in topography, barrier attenuation provided by existing landscaping and buildings and distance attenuation.

The retail unit has been modelled as a building with the following properties:

- internal operational noise levels as detailed in Table 6;
- sound reduction of the façades based on the SRI values in Table 7; and
- relative areas of glazed and brick elements based upon architectural drawings.

Based upon the assumptions above, the table below shows the predicted sound levels compared with the background levels measured at position MP1. The results are representative of worst-case background levels during office operating hours.

	Octave band centre frequency (Hz)						
	63	125	250	500	1k	2k	4k
Calculated sound level at First floor of 196 Deansgate	54	51	56	45	35	28	21
Existing background level, dB	65	61	58	55	52	47	41
Assessment of external noise-breakout relative to existing background, dB	-11	-10	-12	-10	-17	-19	-20

Table 8 – SoundPLAN noise break-out results

It can be seen that the predicted levels are at least 10 dB below the measured L_{A90} background levels, and hence the Local Authority criteria in relation to entertainment noise is satisfied.

6.4 Noise impact at dwellings

Given the significant distance of the nearest noise-sensitive receptor at night-time, bar noise impacts are not expected to be audible. The simplified calculation in Table 9 demonstrates the unlikelihood of an exceedance of the proposed entertainment noise criteria. Sound pressure levels within the A3/A4 unit, and the composite sound reduction performance of the façade elements of the unit, are as assumed previously.

	Octave band centre frequency (Hz)							A-weighted sound pressure level
	63	125	250	500	1k	2k	4k	
Assumed 'worst-case' sound pressure level within A3/A4 unit, dB	86	86	89	86	87	81	78	90 dBA
Composite sound insulation provided by external façade, dB	19	23	22	28	40	39	41	-
Distance attenuation, dB (based on 150 m distance to nearest NSR)	-22	-22	-22	-22	-22	-22	-22	-
Barrier attenuation as a result of buildings obstructing line of sight, dB *	-10	-10	-10	-10	-10	-10	-10	-
Calculated level at NSR, dB (internal SPL minus façade SRI minus distance attenuation)	35	31	35	26	15	10	5	29 dBA
Existing background level, dB	56	51	49	44	42	34	27	47 dBA
Assessment of external noise-breakout relative to existing background, dB	-21	-20	-14	-18	-27	-24	-22	-28 dBA

* This is considered a very conservative estimate of acoustic screening effects to building massing

Table 9 - Noise breakout calculation

It can be seen from the table above that noise levels are expected to be at least 10 dB below prevailing background levels in each individual octave band and would therefore be considered compliant with MCC entertainment noise policy.

6.5 Outdoor seating

Proposals are for an external seating area to be located immediately outside of the A3/A4 unit at Little Quay Street. There will be no amplified music within this seating area.

This area was previously used for outdoor seating by The Old Grapes public house which operated at the site until August 2016. A Google Street View image showing the previous seating arrangement is reproduced in Figure 3 below for context:



Figure 3 – Previous Little Quay Street external seating area for The Old Grapes (© Google)

Considering the lack of amplified music, the significant distance to the nearest residential uses, and the previous use of this space up until 2016, it is not expected that the introduction of a new seating area will result in significant adverse noise impacts to surrounding receptors.

To further minimise the potential of noise disturbance, it is advised that any future tenants of the A3/A4 units should adopt a noise management plan (NMP) to see that managerial and operational practices help keep patron noise to

satisfactory levels.

7.0

Conclusions

7.0 Conclusions

Prevailing noise levels in the vicinity of the site of a proposed retail unit at Sunlight House in central Manchester have been measured.

Limiting noise levels have been provided for external noise impacts at existing nearby noise-sensitive receptors, in order to minimise the potential for adverse noise effects in line with Local and National Planning Policy.

An assessment of the proposed building services plant show that sound levels are lower than existing background levels at nearby receptors and hence there should be a negligible impact on the existing noise environment.

A calculation of internal noise break-out has been undertaken, utilising onerous assumptions of internal entertainment noise levels within a bar and considering sound reduction indices afforded by differing elements of the façade construction. The calculation indicates that noise break-out levels will be lower than existing background levels at nearby receivers and hence there should be a negligible impact on the existing noise environment.

Appendices

Appendix I Noise survey data

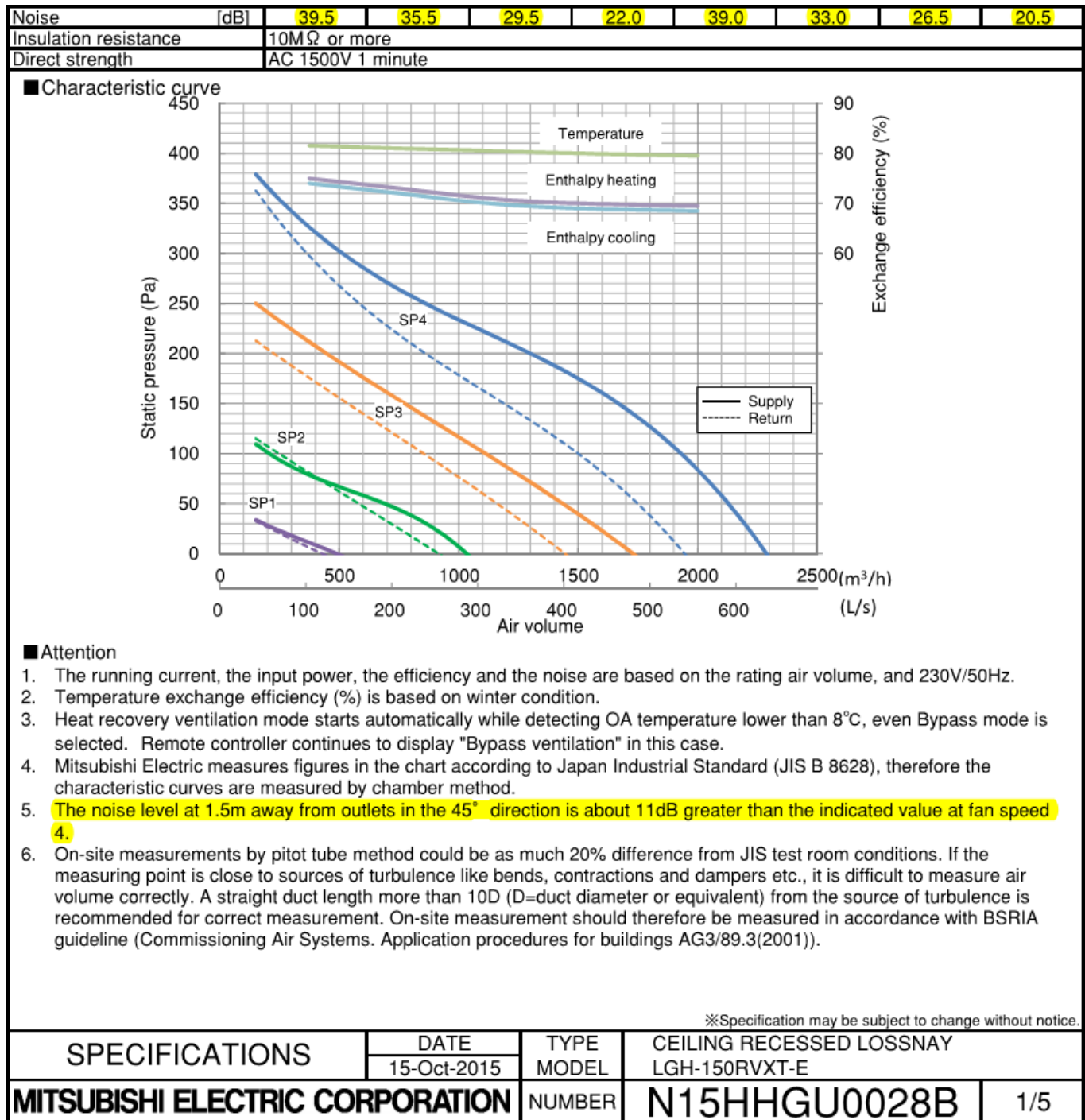
MP1 - 7 November 2018

Measurement start time	L _{Aeq,15min} (dB)	L _{AFMax,15min} (dB)	L _{A90,15min} (dB)
18:00	62	80	58
18:15	62	85	58
18:30	61	85	58
18:45	62	78	58
19:00	63	85	58
19:15	61	84	58
19:30	63	86	58
19:45	60	81	58
20:00	61	82	58
20:15	63	89	59

MP2 – 3 December 2019

Measurement start time	L _{Aeq,15min} (dB)	L _{AFMax,15min} (dB)	L _{A90,15min} (dB)
01:30	52	77	48
01:45	54	92	48
02:00	50	73	47
02:15	54	93	47

Appendix II Manufacturer's sound level data



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