Appendix 6.2

NOISE AND VIBRATION POLICY GUIDANCE

NOTE

Jackson's Row Developments Ltd (hereinafter referred to as ‘the Applicant’) is seeking to construct a major development proposal known as St Michael’s, Jackson’s Row, Manchester, UK

The planning application for the development was originally registered in January 2017. Following feedback, the decision was taken to revise the scheme. Revised plans and documents were submitted in November 2017 and the development was granted planning permission in June 2018.

Through the detailed design process, a number of relatively minor improvements to the original scheme have been identified; these will also provide technical and functional improvements through the next stage design process. The Applicant wishes to progress these proposed changes, which are considered to require amendments to the original scheme, through a Section 73 application.

An Environmental Statement, produced in accordance with the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 2011, was submitted in support of the Approved Development in 2017. The 2017 Environmental Statement comprised three volumes, as follows:

Volume 1: Main Text and Figures;
Volume 2: Technical Appendices;
Volume 3: Non-Technical Summary

With reference to Volumes 1 and 2 of the 2017 Environmental Statement, it has been decided that rather than updating and re-submitting the entire Volumes in support the Section 73 application, an ‘Addendum’ to the 2017 Environmental Statement should be submitted. This is because the Proposed Amendments to the scheme are minor in nature and the potential to affect the environmental assessment is limited.

This Environmental Statement Volume 2 (2017) appendix formed part of the application package for the June 2018 approved scheme and remains valid.

NOISE AND VIBRATION POLICY AND GUIDANCE

NATIONAL PLANNING POLICY FRAMEWORK (NPPF)

Published in March 2012, this document sets out the Government's planning policies for England and supersedes a number of previous Planning Policy Guidance Notes and Planning Policy Statements (amongst other documents), including Planning Policy Guidance Note 24: Planning and Noise. In contrast to PPG 24, reference to noise is scant within the new NPPF. However it does make the following references to noise in the section entitled Conserving and enhancing the natural environment:

"The planning system should contribute to and enhance the natural and local environment by… [a number of points including]…preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution or land instability".

And

"*Planning policies and decisions should aim to:*

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;*
- *recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and*
- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

NOISE POLICY STATEMENT FOR ENGLAND (NPSE)

The Noise Policy Statement for England (NPSE) was published in March 2010. The NPSE is the overarching statement of noise policy for England and applies to all forms of noise other than occupational noise, setting out the long term vision of Government noise policy, which is to:

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

That vision is supported by the following aims:

"Through the effective management and control 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 of life; and*

- *Where possible, contribute to the improvement of health and quality of life."*

The Explanatory Note to the NPSE has introduced three concepts to the assessment of noise in this country:

- **NOEL - No Observed Effect Level.** This is the level below which no effect can be detected and below which there is no detectable effect on health and quality of life due to noise;
- **LOAEL - Lowest Observable Adverse Effect Level.** This is the level above which adverse effects on health and quality of life can be detected; and
- **SOAEL - Significant Observed Adverse Effect Level.** This is the level above which significant adverse effects on health and quality of life occur.

None of these three levels are defined numerically and for the SOAEL the NPSE makes it clear that the noise level is likely to vary depending upon the noise source, the receptor and the time of day / day of the week, etc. The need for more research to investigate what may represent an SOAEL for noise is acknowledged in the NPSE and the NPSE asserts that not stating specific SOAEL levels provides policy flexibility in the period until there is further evidence and guidance.

The NPSE concludes by explaining in a little more detail how the LOAEL and SOAEL relate to the three aims listed in Paragraph 9.2.10 above. It starts with the aim of avoiding significant adverse effects on health and quality of life, then addresses the situation where the noise impact falls between the LOAEL and the SOAEL when "*...all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development.*" The final aim envisages pro-active management of noise to improve health and quality of life, again taking into account the guiding principles of sustainable development.

PLANNING PRACTICE GUIDANCE

In 2014 the Department for Communities and Local Government (DCLG) launched the Planning Practice Guidance web-based resource. It is stated that the guidance is to complement the NPPF and provide advice on how to deliver its policies.

The PPG section on noise includes a table that summarises "*...the noise exposure hierarchy, based on the likely average response*". This table offers 'Examples of Outcomes' relevant to the NOEL, LOAEL and SOAEL effect levels described in the NPSE. The guidance offers no numerical definition of the NOEL, LOAEL and SOAEL, or detailed advice regarding methodologies for their determination. There is also no reference to the further research that was identified as necessary in the NPSE in 2010 to assist in the determining of NOEL, LOAEL and SOAEL.

BS 5228-1:2009+A1:2014 NOISE AND VIBRATION CONTROL ON CONSTRUCTION AND OPEN SITES. PART 1: NOISE (BS 5228-1)

BS 5228-1 provides guidance on appropriate methods for minimising noise from construction activities. Techniques for predicting the likely noise effects from construction works are given; these are based on detailed information on the type and number of plant items being used, their location and the length of time they are in operation. The noise prediction method is used to establish likely

noise levels in terms of the $L_{Aeq,T}$ over the core working day. A database of information is also provided, including measured sound pressure level data for a variety of different construction plant undertaking various common activities, which can be used to estimate levels of noise generated by typical construction works.

Three methods are presented for the assessment of the significance of noise effects. In summary, the assessment could adopt either a series of fixed noise limits, be concerned with ambient noise level changes as a result of the construction operations, or consider a combination of these approaches.

With respect to absolute fixed noise limits, BS 5228-1 discusses those included within the Department of the Environment Advisory Leaflet 72 'Noise Control on Building Sites'. These limits are presented according to the nature of the surrounding environment, for a 12 hour working day. The presented limits are:

- 70dB(A) in rural, suburban and urban areas away from main road traffic and industrial noise;
- 75dB(A) in urban areas near main roads and heavy industrial areas.

The Standard goes on to provide methods for determining the significance of construction noise levels considering the change in the ambient noise level with the construction noise. Two example assessment methods are presented. These are the ABC method (as shown in Table A6.1-1) and the 5dB(A) change method, described below.

Table A6.2-1: Example Threshold of Potential Significant Effect at Dwellings, ABC Method (BS 5228-1)

Assessment Category and Threshold Value Period	Threshold Values, in decibels (dB), $L_{Aeq,T}$		
	Category (A) [A]	Category (B) [B]	Category (C) [C]
Night-time (2300 – 0700)	45	50	55
Evenings and Weekends[D]	55	60	65
Daytime (0700 – 1900) and Saturdays (0700 – 1300)	65	70	75
NOTE 1 A potential significant effect is indicated if the $L_{Aeq,T}$ noise level arising from the site exceeds the threshold level for the category appropriate to the ambient noise level. NOTE 2 If the ambient noise level exceeds the Category C threshold values given in the table (i.e. the ambient noise level is higher than the above values), then a potential significant effect is indicated if the total $L_{Aeq,T}$ noise level for the period increases by more than 3 dB due to site noise. NOTE 3: Applies to residential receptors only.			
A) Category A: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are less than these values. B) Category B: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are the same as Category A values. C) Category C: Threshold values to use when ambient noise levels (when rounded to the nearest 5dB) are higher than Category A values. D) 1900 – 2300 weekdays, 1300 – 2300 Saturdays and 0700 – 2300 Sundays.			

With respect to the 5dB(A) change method, the guidance states:

"Noise levels generated by site activities are deemed to be potentially significant if the total noise (pre-construction ambient plus site noise) exceeds the pre-construction ambient noise by 5 dB or more, subject to lower cut-off values of 65 dB, 55 dB and 45 dB $L_{Aeq,T}$ from site noise alone, for the daytime, evening and night-time periods, respectively; and a duration of one month or more, unless

works of a shorter duration are likely to result in significant effect."

BS 5228-2: 2009+A1:2014 NOISE AND VIBRATION CONTROL ON CONSTRUCTION AND OPEN SITES. PART 2: VIBRATION (BS 5228-2)

BS 5228-2 provides recommendations for basic methods of vibration control relating to construction and open sites. The legislative background is described and guidance is provided on methods of measuring vibration and assessing its effects on the environment.

Guidance criteria are suggested for the assessment of vibration effects. Such criteria are provided in terms of Peak Particle Velocities (PPV) and are concerned with both human and structural responses to vibration, as shown in the table below:

Table A6.2-2: Guidance Criteria for the Assessment of Vibration (BS 5228-2)

Vibration PPV (mms^{-1})	Effect
0.14	Vibration might be just perceptible in the most sensitive situations for most vibration frequencies associated with construction. At lower frequencies, people are less sensitive to vibration.
0.3	Vibration might be just perceptible in residential environments.
1.0	It is likely that vibration of this level in residential environments will cause complaint, but can be tolerated if prior warning and explanation has been given to residents.
10.0	Vibration is likely to be intolerable for any more than a very brief exposure to this level in most building environments.
A) The magnitudes of the values presented apply to a measurement position that is representative of the point of entry into the recipient. B) A transfer function (which relates an external level to an internal level) needs to be applied if only external measurements are available. C) Single or infrequent occurrences of these levels do not necessarily correspond to the stated effect in every case. The values are provided to give an initial indication of potential effects, and where these values are routinely measured or expected then an assessment in accordance with BS 6472-1 or -2, and/or other available guidance, might be appropriate to determine whether the time varying exposure is likely to give rise to any degree of adverse comment	

BS 5228-2 goes on to present guidance criteria applicable to the vibration response limits of buildings in terms of the component PPV; these criteria are presented in the table below. It should be noted that the values in this table are applicable to cosmetic damage only. It is stated within BS 5228-2 that minor damage is possible at vibration magnitudes greater than twice those given in the table.

Table A6.2-3: Guidance Criteria for the Assessment of Vibration (BS 5228-2)

Type of Building	Peak component Particle Velocity in Frequency Range of Predominant Pulse	
	4 Hz to 15 Hz	**15 Hz and above**
Reinforced or framed structures	50 mms^{-1} at 4 Hz and above	50 mms^{-1} at 4 Hz and above
Industrial and heavy commercial Unreinforced or light framed structures	15 mms^{-1} at 4 Hz increasing to 20 mms^{-1} at 15 Hz	20 mms^{-1} at 15 Hz increasing to 50 mms^{-1} at 40 Hz and above
NOTE 1: Values referred to are at the base on the building. NOTE 2: At frequencies below 4 Hz, a maximum displacement of 0.6 mm (zero to peak) is not to be exceeded.		

BS 4142:2014 METHODS FOR RATING AND ASSESSING INDUSTRIAL AND COMMERCIAL SOUND (BS 4142)

BS 4142 describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes:

- Sound from industrial and manufacturing processes;
- Sound from fixed installations which comprise mechanical and electrical plant and equipment;
- Sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

The methods use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

Sound from any plant associated with the employment area, the local facilities and proposed school should be considered in accordance with the requirements of BS 4142:2014 and for both existing and proposed noise-sensitive receptors. The Standard also advises the purpose of the methodology includes the assessment of sound from any plant and activities associated with existing industrial and/or commercial uses at proposed residential dwellings.

The Standard effectively compares and rates the difference between the specific sound level of the source ($L_{Aeq,T}$) and the typical background sound level ($L_{A90,T}$) in the absence of the specific sound. If appropriate, the specific sound level is corrected, by the application of one or more corrections, for acoustic features such as tonal qualities and/or distinct impulses to give a 'rating' level ($L_{Ar,Tr}$).

The Standard advises that the time interval ('T') of the background sound measurement should be sufficient to obtain a representative or typical value of the background noise level.

Comparing the rating level with the background sound level, BS 4142 states:

- "*Typically, the greater this difference, the greater the magnitude of impact*

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

The Standard states that the methodology is applicable for the assessment of industrial and/or commercial sound at proposed new dwellings. However the guidance also states:

"NOTE Where a new noise-sensitive receptor is introduced and there is extant industrial and/or commercial sound, it ought to be recognized that the industrial and/or commercial sound forms a component of the acoustic environment. In such circumstances other guidance and criteria in addition to or alternative to this standard can also inform the appropriateness of both introducing a new noise-sensitive receptor and the extent of required noise mitigation."

CODE OF PRACTICE ON ENVIRONMENTAL NOISE CONTROL AT CONCERTS

Published by the Noise Council in 1995, and commonly known as 'The Pop Code', this document sets out guidance for bodies involved in planning music events, those responsible for licensing such events and those responsible for enforcing the nuisance provisions of the Environmental Protection Act 1990 (England and Wales).

Table A6.2-4 below sets out the guidance contained in this document for events held between 09:00 and 23:00 hours (N.B. not extending past 11PM). The Music Noise Level (MNL) is defined as "*the L_{Aeq} of the music noise measured at a particular location*".

Table A6.2-4 – Guidance Criteria for Music Events Held between (09:00 – 23:00) at the Façade of Noise Sensitive Premises, LAeq,T

Concert days per calendar year, per venue	Venue Category	Guideline
1 to 3	Urban Stadia or Arenas	The MNL not exceed 75 dB(A) over a 15 minute period
1 to 3	Other urban and rural venues	The MNL should not exceed 65 dB(A) over a 15 minute period
4 to 12	All venues	The MNL not exceed the background noise level by more than 15 dB(A) over a 15 minute period

The background noise should level is defined as the prevailing level at a location, measured in terms of the $L_{A90,T}$ noise index, on an equivalent day and at an equivalent time when no concert or sound checks are taking place. It is stated that the value to be used should be the "*arithmetic average of the hourly L_{A90} measured over the last four hours of the proposed music event or over the entire period of the proposed music event if scheduled to last for less than four hours*".

For indoor venues "*used for up to about 30 events per calendar year"* this document suggests that the music noise level should not exceed the background noise by more than 5 dB(A) over a fifteen minute period, for events finishing no later than 23:00 hours.

For events '*continuing*' or '*held between*' the hours of 23:00 and 09:00 hours, it is stated that "*the*

music noise should not be audible within the noise sensitive premises with windows open in a typical manner for ventilation".

Whilst it is acknowledged within the document that the use of 'inaudibility' as a guideline is not universally accepted as an appropriate method of control, to goes on to state that "*Control can be exercised in this situation by limiting the music noise so that it is just audible outside the noise sensitive premises. When that is achieved, it can be assumed that the music noise is not audible inside the noise sensitive premises*."

The document goes on to state that and assessment in terms of dB(A) (i.e. in terms of the $L_{Aeq,T}$ criteria detailed within

Concert days per calendar year, per venue	Venue Category	Guideline
1 to 3	Urban Stadia or Arenas	The MNL not exceed 75 dB(A) over a 15 minute period
1 to 3	Other urban and rural venues	The MNL should not exceed 65 dB(A) over a 15 minute period
4 to 12	All venues	The MNL not exceed the background noise level by more than 15 dB(A) over a 15 minute period

above), can underestimate the intrusiveness of low frequency noise, and that low frequency noise can be very noticeable indoors. It is advised therefore that even if the dB(A) guideline is being met, unreasonable disturbance may be occurring because of low frequency noise. Additional guidance on low frequency noise is therefore provided with reference to the recommendations of a study undertaken by J.E.T Griffiths, J. Staunton and S. Kamath: *A study of Low Frequency Sound from Pop Concerts*. In this regard it is recommended that a level of up to 70 dB in either the 63Hz or 125Hz octave frequency band is "*satisfactory"* a level of 80 dB or more in either of those octave frequency bands causes "*significant disturbance"*.