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Dear Darren,

### **Alexandra Park School Sixth Form Expansion – Technical Note for Noise**

Professional Consult Limited was instructed by Thinking Buildings to prepare a Technical Note for Noise (the 'Technical Note') for the proposed expansion of the sixth form building ('the Development') at Alexandra Park School in Bidwell Gardens, London N11 2AZ, to be referred to hereafter as 'the Site'.

This Technical Note has been prepared in support of the full planning application for a new 6<sup>th</sup> form teaching accommodation at Alexandra Park School. The purpose of this Technical Note is to scope-out the need for a formal Noise Impact Assessment.

The planning application seeks consent for a new 3-storey side extension to the existing 6th form building and associated landscaping. As part of the proposal, it is understood that there will be two Air Source Heat Pumps (ASHPs) installed on the eastern side of the extension which may produce noise impacts at the closest residential dwellings, understood to be located off Bidwell Gardens to the east of the Site.

A pre-application planning advice note has been received from Harringey Council (Ref. PRE/2022/0269 / revised proposal>PRE/2023/0116) which has stated the following with regards to noise:

'....

*The whole of the borough is an air quality management area (AQMA) for both NO2 and PM10. Noise/vibration and air quality studies would be expected with any full planning application.'*

### **Policy & Guidance**

#### **National Planning Policy Framework & National Planning Practice Guidance**

The Government updated the National Planning Policy Framework (NPPF) on 20<sup>th</sup> July 2021 and its associated National Planning Practice Guidance (NPPG) on 24<sup>th</sup> June 2021. Together, the NPPF and NPPG set out what the Government expects of local authorities. The overall aim is to ensure the planning system allows land to be used for new homes and jobs, while protecting valuable natural and historic environments.

The NPPG adds further context to the NPPF and it is intended that the two documents should be read together.

Noise needs to be considered when new developments may create additional noise and when new developments would be sensitive to the prevailing acoustic environment. When preparing local or neighbourhood plans, or taking decisions about new development, there may also be opportunities to consider improvements to the acoustic environment.

Local planning authorities' plan-making and decision making should take account of the acoustic environment and in doing so consider:

- Whether or not a significant adverse effect is occurring or likely to occur;
- Whether or not an adverse effect is occurring or likely to occur; and
- Whether or not a good standard of amenity can be achieved.

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.

The Observed Effect Levels are as follows:

- Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur;
- Lowest observed adverse effect level: this is the level of noise exposure above which adverse effects on health and quality of life can be detected; and
- No observed effect level: this is the level of noise exposure below which no effect at all on health or quality of life can be detected.

Table 1 summarises the noise exposure hierarchy, based on the likely average response.

**Table 1: Noise Exposure Hierarchy**

| Perception                                       | Examples of Outcomes                                                                                                                                                                                                                                                                                                                                                                                        | Increasing Effect Level     | Action                           |
|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|----------------------------------|
| Not Noticeable                                   | No Effect                                                                                                                                                                                                                                                                                                                                                                                                   | No Observed Effect          | No specific measures required    |
| Noticeable and not intrusive                     | Noise can be heard but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.                                                                                                                                                                                                     | No Observed Adverse Effect  | No specific measures required    |
| <i>Lowest Observed Adverse Effect Level</i>      |                                                                                                                                                                                                                                                                                                                                                                                                             |                             |                                  |
| Noticeable and intrusive                         | Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life. | Observed Adverse Effect     | Mitigate and reduce to a minimum |
| <i>Significant Observed Adverse Effect Level</i> |                                                                                                                                                                                                                                                                                                                                                                                                             |                             |                                  |
| Noticeable and disruptive                        | The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature                                                                       | Significant Observed Effect | Avoid                            |

|                                |                                                                                                                                                                                                                                                                                        |                             |         |
|--------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------|---------|
|                                | awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.                                                                                                                                                         |                             |         |
| Noticeable and very disruptive | Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory | Unacceptable Adverse Effect | Prevent |

The subjective nature of noise means that there is not a simple relationship between noise levels and the impact on those affected. This will depend on how various factors combine in any particular situation.

These factors include:

- The source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day - this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night;
- For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- the spectral content of the noise and the general character of the noise. The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.

More specific factors to consider when relevant:

- where applicable, the cumulative impacts of more than one source should be taken into account along with the extent to which the source of noise is intermittent and of limited duration;
- Consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation is likely to be necessary. Further information on ventilation can be found in the Building Regulations; and
- If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.

#### **BS4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'**

This standard describes methods for rating and assessing sound of an industrial 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 processes or premises, such as that from forklift trucks, or that from train or ship movements on or around an industrial or commercial Site.

The procedure detailed in the standard compares the measured or predicted noise level 'the specific noise level' from any of the above detailed noise sources with the background sound level at a residential dwelling. The measured background sound level at a receptor should be reliable and should not necessarily ascertain a lowest measured background sound level, but rather to quantify what is 'typical.'

The specific noise level also acknowledges the following reference time intervals depending upon whether the noise source operates during daytime or night-time periods:

- Daytime (07:00 - 23:00): 1 hour; and
- Night-time (23:00 - 07:00): 15 minutes.

There are a number of 'penalties' which can be attributed to the specific sound level, either subjectively or objectively, depending upon the 'acoustic features' of the sound level under investigation as follows. These penalties vary in their weighting depending upon the severity of the acoustic feature, as follows (with regards to the subject method):

#### Tonality

- +2dB: where the tonality is just perceptible;
- +4dB: where the tonality is clearly perceptible; and
- +6dB: where the tonality is highly perceptible.

#### Impulsivity

- +3dB: where the impulsivity is just perceptible;
- +6dB: where the impulsivity is clearly perceptible; and
- +9dB: where the impulsivity is highly perceptible.

#### Intermittency

- +3dB: where the intermittency is readily distinctive against the acoustic environment.

Where the assessment is carried out using the objective method, the tonality penalty is either 0dB or 6dB and the impulsivity penalty can range from 0dB up to 9dB in increments of 1dB, depending on the level of impulsivity identified.

In addition to the above acoustic features, there is a penalty for 'other sound characteristics' of +3dB where a sound exhibits characteristics that are neither tonal nor impulsive, though is readily distinctive against the acoustic environment.

BS4142 goes on to state that the rating level is equal to the specific sound level if there are no such features present or expected to be present.

Assessment of the rating level relative to the background noise level can yield the following commentary:

- Typically, the greater this difference (between the rating level and the background sound level), the greater the magnitude of impact;
- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context; and
- 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. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.

Whilst the amended 2019 Standard does make various references to it not being intended to assess noise impacts at indoor locations, section 1.1 does state 'The methods described in this British Standard 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'. Example 6 in the Standard states '*In addition to the rating/background sound level comparison shown in Table A.6, the primary concern is the potential for disturbance of residents who could be sleeping with open bedroom windows. Other guidance, such as BS 8233, might also be applicable in this instance*'.

With the above in mind, and for a clear need to ensure that any potential commercial or industrial noise impacts at the building façade do not give rise to internal noise level which causes sleep disturbance in bedrooms, this Assessment will ensure that the predicted rating level (specific sound level including any character corrections) does not exceed 30dB in bedrooms.

### **Consideration of Noise Impacts from Development at Residential Dwellings**

It is understood that there will be two ASHPs in the ASHP enclosure which is located to the east of the Development. It is understood that there will be a number of solar electricity panels (photovoltaic, 'PV' panels) located on the roof space however there will be no electrical plant located on the roof space, associated with these PV panels. Accordingly, this Technical Note will consider the noise impact from the two ASHPs only.

Noise generated by ASHPs requires assessment in line with the guidance presented in BS4142:2014+A1:2019 as described above. This type of assessment compares the predicted rated level (predicted specific noise level, corrected for any acoustic characters or features) of noise at a residential dwelling with the existing 'pre-development' background sound level. For the purposes of this Technical Note, a background sound survey has not been completed however the Assessment has been informed by an assumed daytime background sound level which we would typically expect to find in such an urban environment.

Table 2 calculates the specific level of noise at the Receptor.

**Table 2: Calculation of Specific Noise Level at Closest Residential Receptors**

| Manufacturer Sound Power Level, $L_{WA}$ (dB) | Proposed No. Plant | Total Combined Sound Power Level, $L_{WA}$ (dB) | Distance to Closest Residential Receptor from Development (m) | Calculated Sound Pressure Level at Receptor, $L_{Aeq,T}$ (dB) |
|-----------------------------------------------|--------------------|-------------------------------------------------|---------------------------------------------------------------|---------------------------------------------------------------|
| 77                                            | 2                  | 80.0                                            | 76                                                            | 34.4                                                          |

The following has been considered in determining if any acoustic features exist in the predicted noise level at the closest residential receptor:

- **Tonality:** In determining if any tones exist in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the subjective method;
- **Impulsivity:** In determining if any impulsiveness is evident in the measured noise levels, the methodology set out in BS4142:2014 has been followed using the subjective method;
- **Intermittency:** Whether or not the measured operations turn on or off during the assessment reference periods; and
- **Other sound characteristics:** Where no penalties are allocated for the above features, but there will be an audible noise at the closest receptor.

Table 3 attributes appropriate character corrections.

**Table 3: Character Corrections**

| Noise Source | Tonality Correction (dB) | Impulsivity Correction (dB) | Intermittency Correction (dB) | Other Sound Characteristics Correction (dB) | Comments                                                                                               |
|--------------|--------------------------|-----------------------------|-------------------------------|---------------------------------------------|--------------------------------------------------------------------------------------------------------|
| 2 x ASHPs    | 2                        | 0                           | 3                             | 0                                           | Possible tonality may be just audible and the units can switch on/off during daytime reference period. |

|                                                               |    |   |   |   |  |
|---------------------------------------------------------------|----|---|---|---|--|
| Highest Correction for Assessment Period                      | 2  | 0 | 3 | 0 |  |
| Overall Correction to be added to Specific Noise at Receptors | +5 |   |   |   |  |

Table 4 completes the BS4142:2014+A1:2019 assessment using an adopted typical daytime background sound level of 45dB  $L_{A90,15mins}$  which is considered to be typical for an urban environment.

**Table 4: BS4142 Assessment**

| Calculated Sound Pressure Level at Receptor, $L_{Aeq,T}$ (dB) | Overall Character Correction (dB) | Rated Noise Level $L_{A,r}$ (dB) | Adopted Daytime Background Sound Level, $L_{A90,15mins}$ (dB) | Difference +/- |
|---------------------------------------------------------------|-----------------------------------|----------------------------------|---------------------------------------------------------------|----------------|
| 34.4                                                          | +5                                | 39.4                             | 45                                                            | -5.6           |

Table 4 indicates that the rated of noise falls below the adopted typical background sound level for the daytime period (the criteria noise level) and BS4142:2014+A1:2019 provides the following advice for this outcome:

*‘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.’*

Given that the rated level of noise, at the closest residential dwellings to the ASHPs, falls below the adopted typical daytime background sound level, it is considered that noise from the Development will be sufficiently low enough to accord with the ‘No Observed Adverse Effect Level’ as detailed in the PPG and as such noise should not be deemed to be a determining factor in the granting of planning permission for this Development.

### Summary

Professional Consult Limited was instructed by Thinking Buildings to prepare a Technical Note for Noise for the proposed expansion of the sixth form building at Alexandra Park School in Bidwell Gardens, London N11 2AZ.

This Technical Note has been prepared in support of the full planning application for a new 6<sup>th</sup> form teaching accommodation at Alexandra Park School. The purpose of this Technical Note is to scope-out the need for a formal Noise Impact Assessment.

The planning application seeks consent for a new 3-storey side extension to the existing 6th form building and associated landscaping. As part of the proposal, it is understood that there will be two Air Source Heat Pumps (ASHPs) installed on the eastern side of the extension which may produce noise impacts at the closest residential dwellings, understood to be located off Bidwell Gardens to the east of the Site.

A pre-application planning advice note has been received from Haringey Council (Ref. PRE/2022/0269 / revised proposal>PRE/2023/0116) which has stated the following with regards to noise:

‘....

*The whole of the borough is an air quality management area (AQMA) for both NO<sub>2</sub> and PM<sub>10</sub>. Noise/vibration and air quality studies would be expected with any full planning application.’*

This Assessment has shown that the rated of noise falls below the adopted typical background sound level for the daytime period (the criteria noise level) and BS4142:2014+A1:2019 provides the following advice for this outcome:

*'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.'*

Given that the rated level of noise, at the closest residential dwellings to the ASHPs, falls below the adopted typical daytime background sound level, it is considered that noise from the Development will be sufficiently low enough to accord with the 'No Observed Adverse Effect Level' as detailed in the PPG and as such noise should not be deemed to be a determining factor in the granting of planning permission for this Development.

Accordingly, it is not considered necessary to undertake a full and detailed Noise Impact Assessment in support of this Development.

Yours sincerely,

For and on behalf of Professional Consult Limited



**John Goodwin BSc (Hons), PGDip, MIOA, MIEEnvSc**  
**Director**