

## Memorandum

**From:**

Simon Everett

**Date**

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**To**

Kelvin Dunleavy

**cc**

Darren Loft

**Subject**

Prospect House – Condition 12 Plant Noise Assessment

Cundall have prepared this memorandum to provide evidence of compliance with Planning Condition 12 related to the Prospect House School development.

**Local Authority Planning Condition**

The site lies within the jurisdiction of Manchester City Council. Planning condition 12 of the approved application (Reference 124767/FO/2019) states the following in relation to plant noise.

*Prior to first use of the development any external equipment, insulation, 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 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. The scheme shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the site. The approved scheme shall be completed before the premises is occupied.*

*Upon completion of the development a verification report will be required to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic consultant's report. The report shall also undertake post completion testing to confirm that the noise criteria has been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.*

*Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around, pursuant to policy DM1 and SP1 of Manchester's Local Development Framework: The Manchester Core Strategy.*

**Plant noise limits**

Full details of plant noise limits are detailed in Cundall's acoustic design report (Ref: FS0831-CDL-XX-XX-SP-AS-45301, RevB, dated 14 November 2019).

An environmental noise survey at the proposed development site has been undertaken by ECUS Environmental Consultants in order to assist with the initial feasibility study for the development. Details of the methodology, weather conditions and full noise data have been outlined within their report Ref: 11024, issued in March 2018.

A summary of noise measurement results is reproduced below.

| Location | Period             | dBL <sub>Aeq</sub><br>Log-average | dBL <sub>Aeq,30min</sub><br>Range | dBL <sub>A1,30min</sub><br>Range |
|----------|--------------------|-----------------------------------|-----------------------------------|----------------------------------|
| M1       | 11:40-15:00<br>hrs | 56                                | 55-57                             | 69-72                            |
| M2       | 11:25-15:05<br>hrs | 47                                | 45-49                             | 62-71                            |

To see that noise from proposed building services plant does not adversely affect the level of amenity enjoyed at nearby dwellings, planning condition 12 has specified that external plant to be limited to 5 dB below the existing background sound levels when measured at 1 m from the nearest noise-sensitive receptor (NSR). These have been identified as existing residential dwellings on Bank House Road to the north west of the site boundary. On this basis, the following table provides recommended limiting plant noise levels based upon the measured background level.

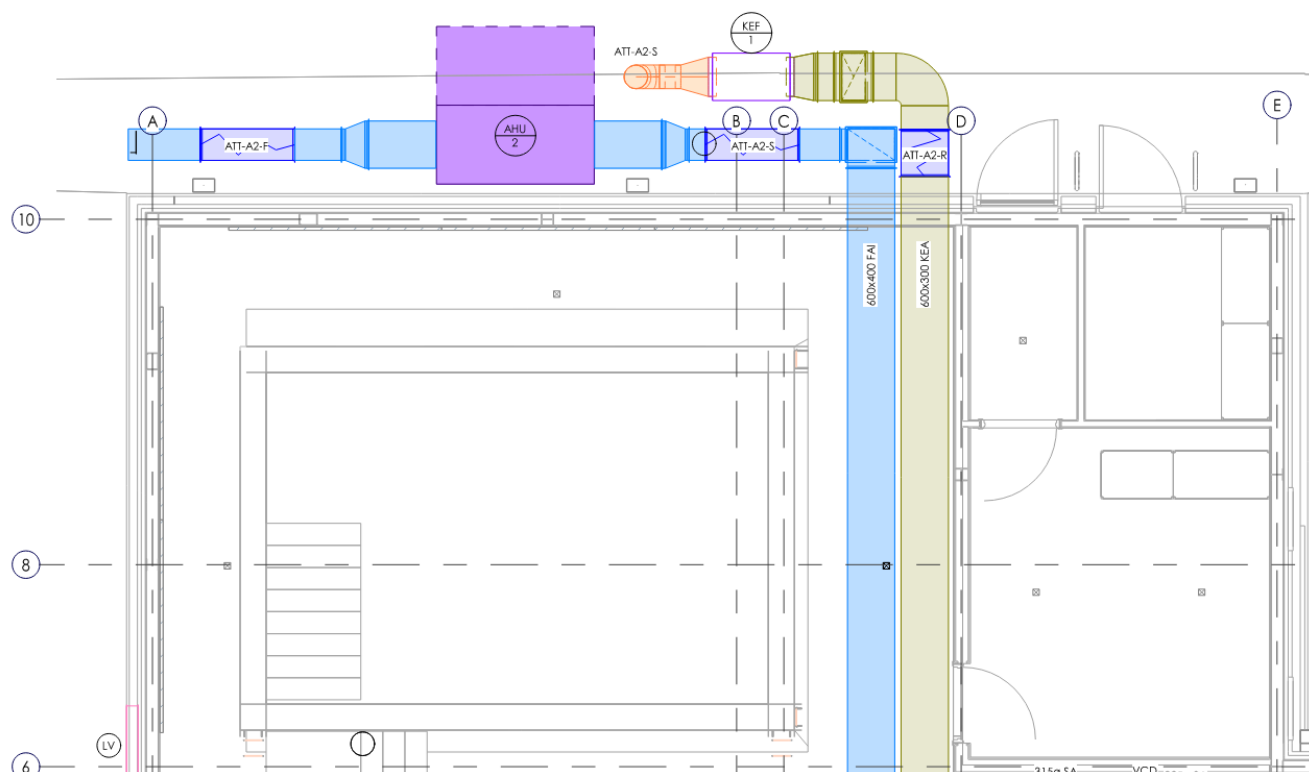
| Time period                                                                                                                     | Representative background sound level dB $L_{A90}$ | Plant noise rating level limit dB $L_{A,r,T,r}$ |
|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|-------------------------------------------------|
| Daytime (07:00-23:00 hrs)                                                                                                       | 42 <sup>[1]</sup>                                  | 37                                              |
| <sup>[1]</sup> Existing background noise value based on modal measured $L_{A90}$ value at location M1 during Ecus noise survey. |                                                    |                                                 |

## Plant noise calculations

The external plant consists of two Air Handling Units (AHUs) serving the Kitchen; one supply fan and one extract fan. The model types are as follows:

- Kitchen supply AHU – Nuair ESBHS3-L
- Kitchen extract AHU– Nuair SQFA43-3ES

The units are located externally to the north of the kitchen, as shown in the following excerpt from Hurstwood Environmental Consulting Engineers Ventilation Layout Drawing 'FS0831-HEC-B1-GF-DR-M-5701 Rev P1' :



Manufacturer's sound power data for the AHUs running at their design duty is presented below:

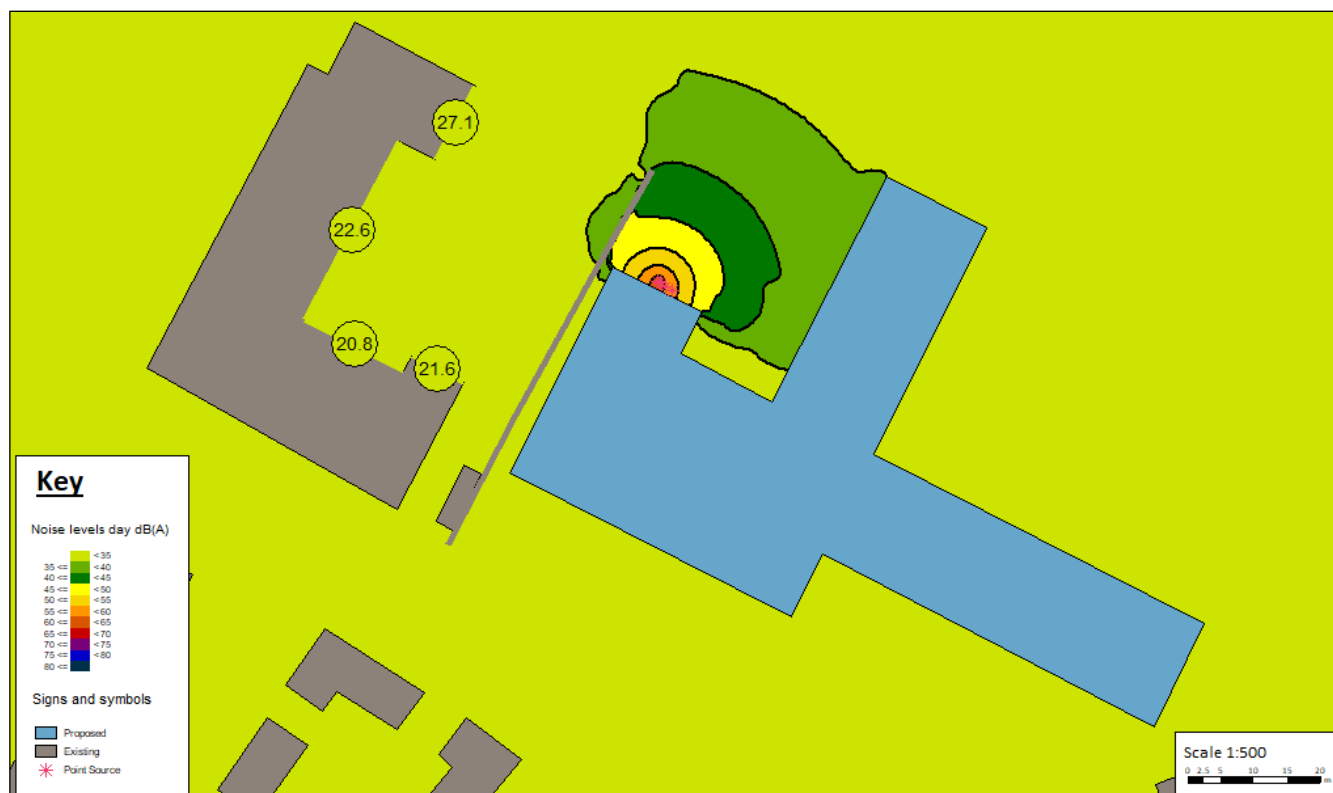
| Description            | Sound Power Level dB L <sub>w</sub> |       |       |       |      |      |      |      |
|------------------------|-------------------------------------|-------|-------|-------|------|------|------|------|
|                        | 63Hz                                | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz |
| ESBHS3-L Induct Inlet  | 88                                  | 83    | 79    | 80    | 73   | 70   | 64   | 59   |
| ESBHS3-L Breakout      | 77                                  | 68    | 66    | 52    | 39   | 36   | 37   | 28   |
| SQFA63ES Induct Outlet | 82                                  | 91    | 72    | 68    | 69   | 70   | 66   | 60   |
| SQFA63ES Breakout      | 79                                  | 84    | 68    | 62    | 55   | 56   | 50   | 36   |

It is understood that atmosphere-side acoustic attenuators provided by Allaway Acoustics been installed on site and achieve the following insertion loss values:

| Description            | In-duct attenuation (dB) |       |       |       |      |      |      |      |
|------------------------|--------------------------|-------|-------|-------|------|------|------|------|
|                        | 63Hz                     | 125Hz | 250Hz | 500Hz | 1kHz | 2kHz | 4kHz | 8kHz |
| Kitchen Supply – AO2G  | 8                        | 14    | 22    | 34    | 41   | 36   | 31   | 20   |
| Kitchen Extract – A13G | 6                        | 13    | 17    | 25    | 25   | 23   | 25   | 20   |

In order to determine the noise propagation from items of plant to the nearest noise sensitive receptor, a 3D noise model has been produced using SoundPLAN 8.2 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 figure below indicates a grid noise map of noise propagation across the site and the resultant façade noise levels a 1m (free field conditions) from the nearest NSRs.



It can be seen from the noise map above that specific noise level at the nearest noise sensitive receptor is 27 dBA. The octave band sound power spectrum indicates no tonal characteristics. Whilst plant is not understood to have highly impulsive or intermittent characteristics as the on/off state would generally be a gradual ramp up/down in power, a +3 dB feature correction for intermittency has been applied as a worst-case assessment.

The following table summarises the results when compared to the Condition 12 rating level limits:

| Representative background sound level, dB<br>$L_{A90}$ | Plant noise rating level limit, dB $L_{Ar,Tr}$ | Cumulative specific sound level, $L_{Aeq,T}$ dB | Acoustic feature correction*, dB | Calculated rating level at noise-sensitive receptors, $L_{Ar,Tr}$ dB | Assessment outcome               |
|--------------------------------------------------------|------------------------------------------------|-------------------------------------------------|----------------------------------|----------------------------------------------------------------------|----------------------------------|
| 42                                                     | 37                                             | 27                                              | +3                               | 30                                                                   | 7 dB below Local Authority limit |
| * Based on a +3 dB correction for intermittency        |                                                |                                                 |                                  |                                                                      |                                  |

As can be seen from the results detailed above, the worst-case level of sound impact due to new building services plant associated with the development is predicted to be:

- 12 dB below the representative daytime background level at the nearest noise-sensitive façade; and
- 7 dB below the Condition 12 rating level limits at the nearest noise-sensitive façade.

Yours faithfully  
For and on behalf of  
Cundall Johnston & Partners LLP



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