

ACOUSTIC DESIGN NOTE

Ref 22174/002/js

Date : 29th June 2022



PROJECT : Highgate School, Science Block Extension

SUBJECT : Initial Assessment of Rooftop ASHP's

1.0 Introduction

- 1.1 An environmental sound level survey has been undertaken to determine the prevailing background sound levels at the nearest appropriate assessment location regarding the proposed plant installation associated with the development at Highgate School, N6 4AY and to establish appropriate sound emission criteria for new building services plant in accordance with local authority requirements.
- 1.2 A report, reference 22174/001/js dated 28th June 2022, sets out the results of this sound survey and a set of plant sound level criteria in line with previous projects undertaken in Haringey.
- 1.3 The sound control criteria are as set out below:

Table 1: Mechanical Plant Sound Emission Criteria – Appropriate Assessment Location

Description	Proposed Plant Rating Sound Emission Criteria to Appropriate Assessment Locations
Daytime weekday (07:00 to 19:00)	37 dB L _{Atr} (1 hour)
Evening weekday (19:00 to 23:00)	33 dB L _{Atr} (1 hour)
Night-time (23:00 to 07:00)	29 dB L _{Atr} (15 minutes)

- 1.4 It is understood that six Mitsubishi CAHV-P500YB-HPB Ecodan air source heat pumps (ASHP) will be installed in a rooftop louvered enclosure to serve the proposed development. Manufacturers source sound data has been provided for this plant in the form of broadband “A” weighted sound power levels (dB L_{WA}).
- 1.5 An initial plant assessment, based upon the Ed Tovey Architects drawing 1177-GS-104 dated April 2018, is set out in the following section.

2.0 Mitsubishi ASHP Assessment (initial)

- 2.1 Typically the sound from ASHP's, certainly at distance, tends to be broadband in nature but, for the sake of a worst case in the absence of spectral data, the assessment has been undertaken on the basis that the majority of the sound power produced by the plant is contained within the 250 Hz octave band. This band often being the controlling frequency band for services plant.

2.2 The sound from the proposed ASHP's have been assessed for two locations. The first is the closest residential property, the Alms Houses - 15 Southwood Lane and the second the proposed rooftop observatory on the Highgate School building.

2.3 15 Southwood Lane

2.3.1 An assessment has been made with respect of the combined level of sound from the proposed six ASHPs to the rear of 15 Southwood Lane, one of several single-storey dwellings to the north of the development site. The calculated combined specific sound level for the ASHPs is 22 dB $L_{Aeq, t}$.

2.3.2 In the absence of octave band data the assessment has been made based on broadband "A" weighted sound levels and consequently no positive judgement as to the presence of a tonal component to the sound can be made. From experience it is unlikely that there will be a tonal component to the sound from the plant as perceived at the assessment location and therefore no tonal sound correction has been applied.

2.3.3 The calculated rating sound level for the plant at the assessment location is therefore equal to the specific sound level. Based upon the broadband sound data for the proposed plant the sound level at the assessment location referenced to the suggested sound criteria gives rise to the differences below:

Table 2: Mechanical Plant Sound Differences – Appropriate Assessment Location

Description	Sound Emission Criteria	Calculated	Difference
Daytime weekday (07:00 to 19:00)	37 dB L_{Atr} (1 hour)	22 dB L_{Atr}	-15 dB
Evening weekday (19:00 to 23:00)	33 dB L_{Atr} (1 hour)	22 dB L_{Atr}	-11 dB
Night-time (23:00 to 07:00)	29 dB L_{Atr} (15 minutes)	22 dB L_{Atr}	-7 dB

2.3.4 On the basis of this assessment, sound from the proposed plant should not give rise to detriment to the amenity of adjacent or nearby residential properties.

2.4 Proposed Observatory

2.4.1 It is understood that part of the proposed development is the construction of an astronomical observatory on an adjacent rooftop to the proposed plant. The dome of the observatory being only about 1.1m away from the louvered rooftop plant enclosure. Calculations have been carried out to assess the likely level of sound from the plant to the observatory with the viewing roof open.

2.4.2 The calculated external sound level at the observatory dome is calculated to be 64 dB $L_{Aeq, t}$ and, with the dome roof open for observation, this would give rise to an internal sound level of about 50 to 54 dB $L_{Aeq, t}$, assuming a (commonly accepted) 10 to 15 dB sound reduction from a partially open window

2.4.3 The calculated internal sound level, although not close to noise at work action levels, would not give rise to a comfortable working environment within the observatory, where a level of around 40 to 45 dB L_{Aeq} would be an appropriate target range. If the observatory is only occupied whilst setting up and maintaining the equipment, with

observation being done remotely through a camera attached to a motorised equatorial mount then such levels are likely to be acceptable in practice.

- 2.4.4 However, if the viewing is done directly through the telescope by users, then it is likely there may be some dissatisfaction with the experience as communication between occupants is likely to be strained due to the sound levels from the plant. In order to offer adequate internal sound levels with the observation roof open, the plant would need to be attenuated by around 15 dBA. This could be achieved using acoustically rated louvres and or a bespoke proprietary acoustic enclosure.

3.0 Comment

- 3.1 This initial assessment is based upon the broadband plant sound levels so far available. The calculated sound levels and conclusion may change should octave band sound data become available, however consideration may need to be given to attenuating the proposed plant in order to offer adequate sound conditions within the observatory.

END of NOTE