Our Ref: T19-075

12th June 2023

Joanne Clark
Principal Planning Officer (CIP Coordination)
Develop Management
Supporting Communities
London Borough of Camden
2nd floor
5 Pancras Square
London
N1C 4AG

Your Ref: PP-11879988

RE: Agar Grove Estate Development – Phase 3 – Blocks JKL & I – ASHP Enclosure Section 73

Dear Joanne,

In relation to **Application PP-11879988** regarding the Application for removal or Variation of a Condition (Section 73) relating to the increase in size of the Air Sourced Heat Pump acoustic enclosures at Phase 3 (Construction phase 1C) of Agar Grove in response to Planning condition no.15 of application 2019/4280/P which states:

15. Noise levels at a point 1 metre external to sensitive facades shall be at least 5dB(A) less than the existing background measurement (LA90), expressed in dB(A) when all plant/equipment (or any part of it), associated with Block A or with Blocks F, G or H, is in operation unless the plant/equipment hereby permitted will have a noise that has a distinguishable, discrete continuous note (whine, hiss, screech, hum) and/or if there are distinct impulses (bangs, clicks, clatters, thumps), then the noise levels from that piece of plant/equipment at any sensitive façade shall be at least 10dB(A) below the LA90, expressed in dB(A).

Reason: To safeguard the amenities of the adjoining premises and the area generally in accordance with the requirements of policies A1 and A4 of the London Borough of Camden Local Plan 2017.

Plant Requirements:

Following the detailed planning consent (August 2014), to meet the stringent requirements of Passivhaus Classification and Building Regulation Part L (Conservation of Fuel and Power) the heating system for Agar Grove 1C was proposed during development of the mechanical and electrical design (RIBA Stage 4 Technical Design) to use Air Source Heat Pumps (ASHP) to heat an 'ambient loop' which runs warm water to each dwelling where a localised Water Source Heat Pump (WSHP) boosts the temperature within the dwelling to provides heating and hot water. Air Source Heat Pumps (ASHPs) were proposed at roof level to each core and captured in the detailed design consent (October 2020).

Since the October 2020 approval, and as ASHP technology is evolving, manufacturer's requirements for communal ASHP systems have changed and the supplier, Daikin, has mandated a minimum of two ASHPs on communal systems i.e. 2 x per core for "better low load turn down, riding the defrost cycle, and (partial) coverage through maintenance periods."

Daikin justified further that "having only 1no ASHP will have knock on effects beyond redundancy options, including the defrost cycle causing larger fluctuations in the ambient loop temperature, particularly in Winter which will lower the overall efficiencies achieved. A single ASHP solution will require a larger ASHP unit in comparison with the preferred two ASHP solution to meet the peak diversified demand. The two ASHP solution results in two smaller capacity units that are closer matched to the actual variation in demands that will be experienced. The benefits of this are quieter units and less start and stop cycles which will prolong the life of the units."

To clarify:

Defrost cycle
In low external temperatures of less than 7'C, ice can form on the ASHPs heat exchanger. The unit can sense this and will go through a 'defrost cycle' to melt the ice. Having two ASHPs per system allows one unit to go into defrost, whilst the other continues to generate heat for the building and its residents.

Low load turn down
When the system only needs a limited top up of heat, and heat is readily available for the air (summer evening, recovering hot water use), it is better to run a small ASHP for a slightly longer time rather that a bigger ASHP starting then quickly stopping.

The above justification has resulted in 4 x ASHP units for Block I and 6 x ASHP units for Block JKL. For more detail on location please refer to Appendix B of Agar Phase 1c Acoustic Assessment – RIBA Stage 4 (20/9/22) by RPS.

This increase in plant per core has led to an increase in the size of the acoustic housing encasing the ASHPs.

Plant Noise Requirements:

A Baseline Environmental Noise and Vibration Survey and Report (JAJ02176-TN-01-R0) has been carried out by Hill's Acoustic Consultant, RPS, to help to discharge associated planning conditions and inform the design of the buildings, including noise limits for mechanical services.

This report highlights the following Noise Sensitive Receptors (NSRs) for the proposed development:

• the residential dwellings located at 1-25 Agar Grove directly opposite of the proposed development, at a distance of approximately 17 m from the proposed development;
• the completed residential blocks (Blocks H and F) from the earlier phases of the Agar Grove Estate Development located directly to the west of the proposed development;
• the future residential receptors of Lulworth Tower, Block E and Block CD to the south of the proposed development;
• the two L&Q (now Origin) housing association blocks (Agar Grove, London NW1 9QW) located directly to the west of the proposed development, and
• the proposed blocks I and JKL themselves.


Block JKL
Core C
Block JKL
Core B
Block I
Core B
Block H
Block I
Block I
Core A
Block JKL
Core A
Cycle
Store
L&Q
Block H
Block F
Sub
L&Q
Lulworth
Tower
Block E
Block CD

External Plant Noise limits:

Based on the measured background noise levels and in accordance with the BS 4142 criteria and planning condition requirements the limiting plant noise criteria have been derived to ensure low adverse impact from any operational outdoor plant. Therefore, RPS have been determined that the rating level arising from plant belonging to the development at 1 m from the nearest future and existing NSR should therefore not exceed the limits stated below in Table 5.4.

Table 5.4 – Plant Noise Criteria

	Limiting Plant Noise Criterion – free-field			
NSR	Representative background sound level, L_{A90} (dB) at NSRs		Rating Level @ 1 m from NSR (dBA)	
	Daytime	Night-time	Daytime	Night-time
Block H, Block F and north/northwest facades of blocks I and JKL	48	36	43	31
Lulworth Tower, Block E, Block CD and south facades of blocks I	40	35	35	30
L&Q blocks and east facades of blocks I and JKL	46	36	41	31

RPS noted that the plant related to Blocks I and JKL is assumed to be operational 24/7. Sound from the proposed plant is not expected to have any tonal, impulsive or distinguishable characteristics. Based on this and the planning condition requirement, the limiting plant noise Criteria determined by RPS in their RIBA Stage 4 Acoustic Report (20/9/22) should be as shown in Table 5.4

The ASHP units were included in the 3D noise model based on the provided sound power level data for each item of plant by manufacturer's data and the required attenuation of the enclosure of each ASHP unit has been specified to ensure that the predicted specific sound levels at the NSRs meet the requirement of planning condition 15.

RPS determined that the composite performance of the enclosure, i.e., the total enclosure including any louvres/ openings was needed to meet the specification shown in Table 5.6.

Table 5.6 – Predicted Specific Noise Levels at NSRs

Sound reduction R_w (dB)	Linear Octave Frequency Bands (dB)							
	63	125	250	500	1000	2000	4000	8000
20 dB R_w	6	14	16	18	20	19	13	3

Designed solution:

Using accurate acoustic data from the ASHP manufacturer, Daikin, our ASHP enclosure designer and supplier, Spectra, have confirmed under item 10 of their Design Report (32.061.02.R2) that the proposed enclosures provides a sound reduction of 21 dB Rw. Therefore, this meets the acoustic requirements of the BS 4142 criteria and planning condition requirements, whilst also meeting the complicated air flow and pressuredrop requirements for the ASHPs.

Alternate options explored:

Hill meet with Camden Planners Nora Constantinescu, Edward Jarvis and Alex Bushell as well as members of the client and design team on the 17th of November 2022 to discuss alternate options. Camden Planning advised that a brick enclosure would be their preference but Hill explained that brickwork would not achieve the challenging acoustic attenuation or air flow constraints.

Yours Sincerely,

Ben Clarke
Senior Technical Coordinator
Hill Partnerships Ltd