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Our ref: P18-282-R01
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By email only: Garry.Davies@sra-architects.co.uk

Dear Garry,

Re: Caffyns Audi, Angmering - Noise Assessment re Planning Conditions 15 and 16

As instructed, we have reviewed the noise-related conditions attached to the planning consent for the above approved development, which is currently under construction. The noise-related conditions are as follows:

15. *The noise rating level of the valet, MOT and workshop bay activities and fixed building services plant at the site shall not exceed the background noise level at Kelston House, at a location 25m west of the east garden boundary. Measurements and assessments shall be made in accordance with BS 4142:2014 - Methods for rating and assessing industrial and commercial sound.*
16. *Prior to the occupation of the premises, a scheme of the mitigation measures, necessary to achieve a rating level not exceeding the background noise level at the location stated in condition 15, shall be agreed in writing with the local planning authority and thereafter carried out in accordance with the approved scheme.*

Within one month of implementation a test shall be carried out and the results submitted to the local planning authority to demonstrate that the attenuation measures specified in the agreed scheme are effective and achieve the levels specified within the scheme. Where necessary, calculations shall be presented to demonstrate noise levels at the assessment location. Where access to that location is not available. In the event that the specified noise levels have not been achieved, then a further scheme of attenuation works shall be submitted to the local planning authority within 28 days and shall be installed within 2 months of being approved in writing by the local planning authority and thereafter retained.

Condition 16 was originally presented in a single paragraph but has been split above to highlight the two distinctly separate parts of the condition, to be completed pre- and post-occupation respectively. Condition 15 simply sets the criterion applicable to Condition 16 and does not require specific separate action.

It is noted that the applicable criterion is 'tied' to the background noise level. An extensive survey of background noise levels was undertaken by Hepworth Acoustics Ltd, as part of our planning-stage noise assessment work for the development. This was undertaken at a location representative of the assessment location stipulated in Condition 15, i.e. 25m west of the east garden boundary of Kelston House (hereafter "the assessment location", over the period 21-27 August 2015. The results of the survey are set out in Hepworth Acoustics Ltd report reference: P15-397-R03, dated: November 2015.

It is reasonable in our view to make use of this survey data, given that it was used in part as the basis upon which the planning consent was granted, as the basis of assessment with respect to the associated conditions. As such, no further background surveys have been undertaken after planning approval being granted.

The planning-stage noise assessment determined a baseline background noise level of 48dB L_{A90} . Accordingly, in line with the Condition 15, the rating noise level, as determined in accordance with BS 4142: 2014, is to not exceed 48dB $L_{A,T}$ at the assessment location, based on the cumulative result of the following elements of the operation:

- Valet
- MOT and workshop bay activities
- Fixed building services plant

BS 4142: 2014 *'Methods for rating and assessing industrial and commercial sound'* requires the 'rating' noise level for the operation to be compared with the L_{A90} background noise level in the absence of the operational noise. The 'rating' level is derived based on the 'specific' L_{Aeq} noise level attributable to the operation with an 'acoustic feature' penalty added for any noise sources which give rise to tonal, impulsive, intermittent, or other characteristics readily distinctive against the residual acoustic environment.

BS 4142: 2014 stipulates that noise impacts should be assessed over a reference time interval of 1-hour during the daytime (0700-2300hrs).

An initial estimate of the impact of the operation is determined by subtracting the background level from the rating level. Where the initial estimate of the impact needs to be modified due to the context, BS 4142: 2014 states that all pertinent factors should be taken into account in determining whether the initial estimate of the impact needs to be modified, including the absolute level of sound, the character and level of the residual sound and the sensitivity of the receptor.

As part of the above-mentioned planning-stage noise assessment work, and as set out in the above referenced report on the same, a survey of typical operational noise levels was carried out at the Caffyns VW dealership and servicing centre in Worthing, which is very comparable in to the approved Angmering Audi development.

The three elements of the operation listed above are considered in turn:

Valet

Based on measurements at Caffyns VW Worthing, typical worst-case component noise levels are 68dB $L_{Aeq,T}$ at 5m during operation of a dry valet bay (i.e. vacuum cleaner), and 73dB $L_{Aeq,T}$ at 5m during operation of a wet valet bay (i.e. jet wash).

It is understood that the scheme includes a 4-bay dry valet and a 2-bay wet valet. A 1.8m high acoustic screen is to be provided to the boundary of the site to sensitive areas.

From observations of working practices and discussions with staff at Caffyns VW Worthing, assessment is based on an estimated worst-case one-hour period with the vacuum cleaner / jet wash in each bay operational for 10-minutes in each 1-hour period.

At this stage, a cautious acoustic feature correction of +9dB is considered appropriate in accordance with BS 4142: 2014 to account for the intermittent and impulsive character of some aspects of the valet noise.

Accounting for the operation of all bays (corrected for anticipated on-time), distance attenuation and acoustic screening at the boundary, the predicted rating noise level for the valet at the assessment location is therefore 47dB $L_{Ar,1hr}$.

It is noted that this is based on activity with valet bay doors left open, however it is understood that there is no operational impediment to operating with valet doors closed. This would result in a significant reduction of valet noise and so will be an available solution in any event that valet operation is particularly intensive, such that it exceeds the estimated on-time of 10-minutes per hour for of the vacuum cleaner / jet wash in each bay.

MOT and workshop bay activities

Based on measurements at Caffyns VW Worthing, a reverberant internal noise level of 76dB $L_{Aeq,1hr}$ may be taken to be a very robust prediction of the worst-case one-hour workshop noise.

It is noted that the east elevation of the workshop is formed of a built-up cladding system comprising internal and external profiled metal sheets with 180mm fibreglass insulation quilt between. A single-figure sound reduction index of at least 35dB R_w is anticipated for this construction. It is also noted, contrary to proposals at planning stage, that no vehicle access door is included in that workshop elevation.

At this stage, a cautious acoustic feature correction of +6dB is considered appropriate in accordance with BS 4142: 2014 to account for the intermittent and impulsive character of any audible workshop noise.

Accounting for the above details and distance attenuation, the predicted rating noise level for the MOT and workshop bay activities at the assessment location is therefore no greater than 35dB $L_{Ar,1hr}$.

Fixed building services plant

All proposed fixed building services plant is to be located at first floor level towards the central part of the east side of the building, i.e. away from Kelston House. This is separated into two adjacent plant areas:

- Ducted air-handling plant comprising a single main AHU and additional extract system, all housed within enclosed plant room, albeit with non-acoustic louvred external wall to east
- External condenser enclosure, bounded by way of insulated composite panels to all sides and open to above, comprising two twin-fan VRF condenser units, and a single additional small inverter unit

In respect of the ducted air-handling plant, the following stated source noise levels have been provided:

- AHU: Intake = 64dB L_w , Exhaust = 81dB L_w , Casing = 57dB L_w
- Extract: Exhaust = 74dB L_w , Casing = 58dB L_w

Accounting for termination losses only, the cumulative reference duct termination noise is predicted to be 74dB L_p at 1m. Accounting for plant room design, plant room noise break-out via the louvres is predicted to be 52dB L_p at 1m. Accordingly, the overall predicted reference noise level at 1m laterally from the plant room east elevation is 74dB L_p .

Steady and continuous broadband noise is anticipated from this type of plant and hence no acoustic feature correction is considered necessary in accordance with BS 4142: 2014. Accounting for distance attenuation and acoustic screening (cautiously taken as 20dBA based on the whole building acting as the acoustic screen) the predicted rating noise level for the ducted air-handling plant at the assessment location is therefore 18dB $L_{Ar,1hr}$.

In respect of the condensers, the following stated source noise levels have been provided:

- Twin-fan VRF unit (2 twin units proposed): 58dB L_p at 1m laterally (per fan)
- Small inverter unit: 53dB L_p at 1m laterally

Accounting for surface directivity, the cumulative reference condenser noise level at 1m laterally from the units is predicted to be 71dB L_p. Steady broadband noise is anticipated from this type of plant, however there may be some intermittency of operational and hence an acoustic feature correction of +3dB is considered appropriate in accordance with BS 4142: 2014.

Accounting for distance attenuation and acoustic screening (cautiously taken as 10dBA based on the plant compound and building edge acting as the acoustic screen) the predicted rating noise level for the condensers at the assessment location is therefore 29dB L_{Ar,1hr}.

The overall rating noise level for proposed fixed building services plant at the assessment location is therefore 29dB L_{Ar,1hr}.

Cumulative Noise

The cumulative predicted noise rating level at the assessment location is summarised below:

- Valet – 47dB L_{Ar,1hr}.
- MOT and workshop bay activities – 35dB L_{Ar,1hr}.
- Fixed building services plant – 29dB L_{Ar,1h}
- **TOTAL – 47dB L_{Ar,1hr}.**

Based on the above and the relevant criterion, i.e. that the noise rating level as determined in accordance with BS 4142: 2014 of the valet, MOT and workshop bay activities and fixed building services plant is to not exceed 48dB L_{Ar,T} at the assessment location at Kelston House, the scheme currently under construction is predicted to be compliant with the requirement of Condition 15 of the planning consent. Consequently, it is concluded that the first part of Condition 16, i.e. the pre-occupation requirement, may be discharged.

Yours sincerely,
For Hepworth Acoustics Ltd



Graham Bowland BSc MIOA
Technical Director