



Comet Hotel, Hatfield

Plant noise impact assessment – Planning condition 19

6206.3

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Revision A



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Plant noise impact assessment

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2 Summary

- 2.1 This report has been prepared to discharge a planning condition relating to the noise impact due to new mechanical services equipment at the Comet Hotel development in Hatfield.
- 2.2 The planning condition requires the cumulative noise rating of all the proposed plant to be at least 10 dB below the existing background noise levels at the nearby residential receptors, during the daytime and night-time.
- 2.3 Noise emission from the proposed plant has been determined and noise propagation modelled with proprietary software CadnaA.
- 2.4 Where plant details are not known, noise limits for the plant have been stated.
- 2.5 The potential noise impact is calculated and assessed in accordance with BS 4142.
- 2.6 Based on the current development proposals it is calculated that the planning condition requirements will be met and the condition can be discharged.
- 2.7 To meet the criteria the following noise limits must be achieved:
 - Total sound pressure level of 76 dB $L_{Aeq,T}$ within the basement plant room
 - Total sound power level of the equipment within the existing hotel plant deck shall not exceed 90 dB L_{WA} .
 - The sound power level of the individual room extracts shall not exceed 54 dB L_{WA} for each unit, running at the extract duty for kitchens and bathrooms.

3 Scope of appointment

- 3.1 Apex Acoustics has been commissioned to undertake an assessment of the noise from new mechanical services equipment associated with the development to discharge the plant noise related planning condition.
- 3.2 The scope of our instruction includes:
 - Analysis of proposed source noise levels, using manufacturers' data provided by the client;
 - Calculate noise propagation to the noise-sensitive receptor and assess the impact in accordance with BS 4142: 2014;
 - Advise on a scheme for noise mitigation and noise limits to satisfy Local Authority requirements;

4 Introduction

- 4.1 New mechanical services equipment is to be installed at the Comet Hotel redevelopment and the planning application requires a noise assessment of this plant to be submitted and approved, to discharge planning condition 19.
- 4.2 The new equipment will consist of:
- Water boilers, pumps, CHP and electrical plant located within the basement of the hotel extension
 - Extract plant and air conditioning plant associated with the hotel refurbishment, located on the lower roof of the existing building
 - Extract fans within each of the individual apartments / studios which extract from the building facades above the windows of each apartment / studio.
- 4.3 An ambient noise survey was undertaken as part of the planning application, and this established the baseline background noise levels used for the assessment, Reference 1.
- 4.4 The nearby noise sensitive receptors are identified as the residential properties to the south west of the site.
- 4.5 The site location is shown in Figure 1, which highlights the plant areas and the nearby residential receptors.



Figure 1: Site, measurement positions and identified noise sensitive receptors

5 Planning policy and noise criteria

5.1 Local Authority requirements

5.2 The local authority has granted planning permission for the development, Reference 2, and have included the following planning condition:

Condition 19

Prior to the construction of each block, no development shall commence until an acoustic report has been submitted to and approved in writing by the Local Planning Authority detailing the noise from plant and equipment to be installed relating to that building showing that noise emissions will be 10dB (L_{Aeq}) below the background noise level (L_{A90}) at the nearest residential properties (using the methodology outlined in BS142:2014). The scheme shall be completed in accordance with the approved details before any part of each building hereby approved is occupied and maintained thereafter in accordance with the approved details.

6 Existing acoustic environment

- 6.1 An environmental noise survey was performed between 16 July 2015 and 21 July 2015. The lowest background sound levels measured during the survey were 51 dB $L_{A90,15min}$ during the daytime and 47 dB $L_{A90,15min}$ at night.
- 6.2 Based on the requirements of the Welwyn Hatfield Council and on the results of the noise survey, all plant must be designed such that the cumulative noise level at 1 m from the worst affected windows of the nearby noise sensitive premises does not exceed 41 dB L_{Aeq} during the daytime and 37 dB L_{Aeq} during the night.
- 6.3 The measurement positions are shown in Figure 1 and the survey details are included in the planning application noise assessment report, Reference 1.

7 Noise sources

7.1 Proposed plant and associated noise levels

7.2 The mechanical plant is assessed based on plant details supplied by the mechanical engineers.

7.3 The new equipment will consist of:

- Water boilers, pumps, CHP and electrical plant located within the basement of the hotel extension
- Extract plant and air conditioning plant associated with the hotel refurbishment, located on the lower roof of the existing building
- Extract fans within each of the individual apartments / studios which extract from the building facades above the windows of each apartment / studio.

7.4 Hotel extension basement plant room

7.5 The layout and associated noise levels for the plant in the hotel extension basement plant room are shown in Figure 2.

7.6 The total sound power levels of the plant have been predicted based on the sound pressure levels at 1m and the estimated measurement area of the equipment.

7.7 The internal sound pressure level due to the plant has been estimated as 76 dB $L_{Aeq,T}$, assuming 20m² of absorption within the plant room.

7.8 The noise from the plant room can break out through the louvered opening which are within the stairwell access to the plant room.

7.9 The louvre openings are estimated to be 2m² and therefore the total sound power which is emitted from the plant room, via the stairwell is 79 dB L_{WA} .

7.10 This has been modelled as an area source, at the opening of the stairwell, with a total sound power level of 79 dB L_{WA} .

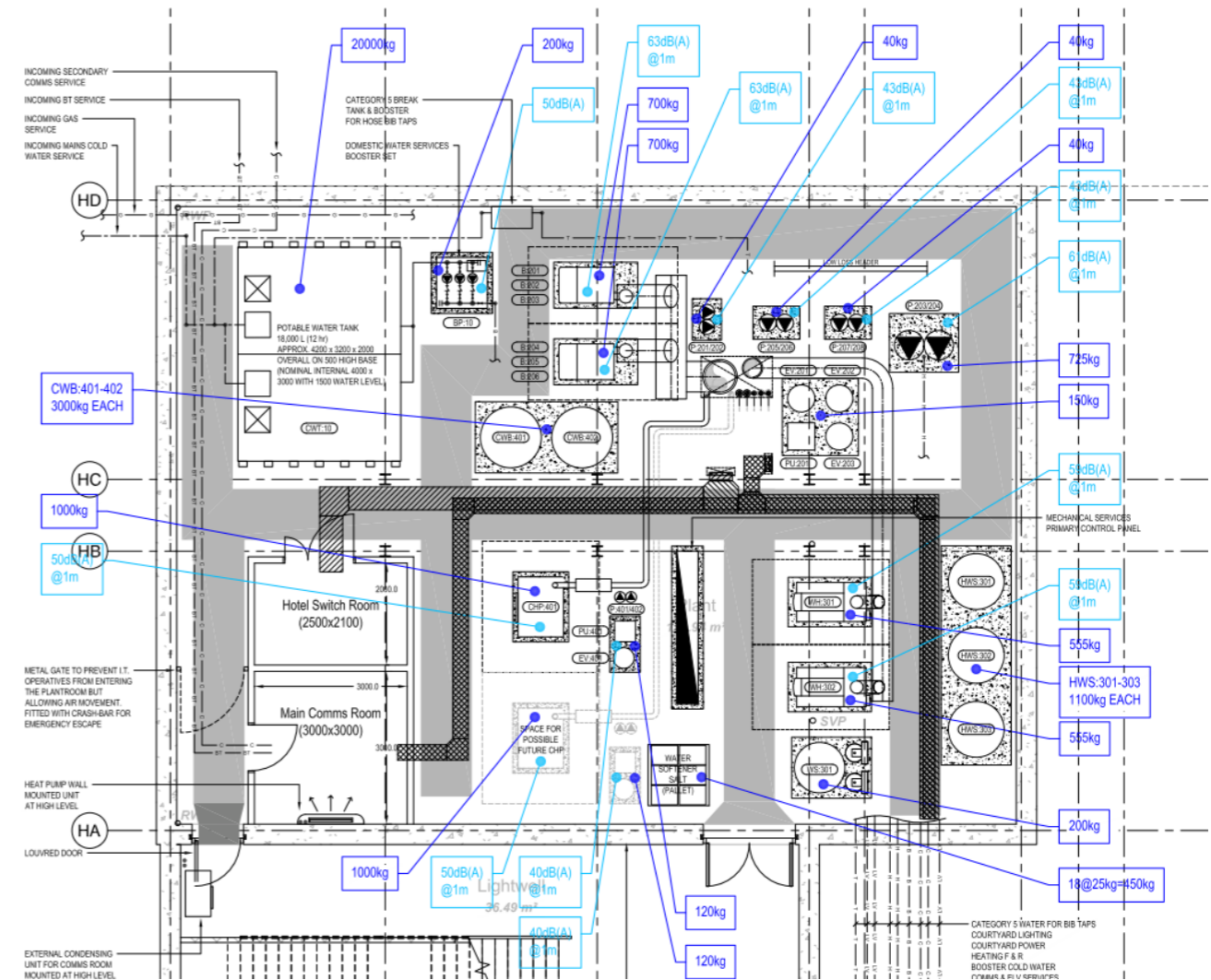


Figure 2: Hotel extension basement plant room

7.11 Existing hotel plant room and roof mounted plant

7.12 The plant associated with the existing hotel has not been confirmed and to demonstrate that the planning conditions can be achieved, we have set a noise limit for the plant, within the plant roof deck area.

7.13 It has been modelled as an area source with a total sound power of 90 dB L_{WA} and includes the shielding effect of the surrounding building.

7.14 To control the noise, break into the hotel the location of the plant should be reviewed so that the sound pressure levels do not exceed 73 dB at 1m from the façade of the hotel building.

7.15 Individual room extracts

7.16 Each studio or apartment has a self-container ventilation extract system. The actual plant selection is still to be confirmed therefore to demonstrate that the planning condition requirements can be achieved a noise specification for each unit has been established.

7.17 A noise level of 40 dB $L_{Aeq,T}$ at 2m is proposed, to ensure that levels at adjacent rooms are suitably controlled, which is equivalent to a maximum sound power level of 54 dB L_{WA} for each unit, running at the extract duty for kitchens and bathrooms.

7.18 The noise levels when the unit is operating at a whole house rate would be quieter than for the extract duty, so this represents a very worst case.

7.19 Each unit has been modelled as a point source on the facade of the building.

7.20 Operation times

7.21 The assessment has been done for night-time only, as a worst case where all plant is operational during the night.

7.22 Noise transmission and propagation

7.23 Noise transmission and propagation is modelled to the NSRs based on the noise source data detailed, using proprietary software, CadnaA, Reference 3.

7.24 This models noise propagation outdoors according to ISO 9613, Reference 4.

7.25 The height of the NSRs has been set at 4.5m for receptors with two storeys.

8 Assessment results

8.1 The calculated noise contours showing the impact across the site are shown in Figure 3.



Figure 3: Sound contours at 4 m, showing the calculated specific sound level, L_{Aeq} , with all plant operating

8.2 The predicted specific noise level at the nearest receptors, with all the plant running is 37 dB $L_{Aeq,Tr}$ which is 10 dB below the existing background noise levels.

8.3 The noise rating is considered to be equal to the specific noise for this assessment as the contribution from any one item will be considerably below the existing ambient levels and any characteristics will not be distinguishable.

8.4 The switching on or off of extract fans contribute less than 20 dB $L_{Aeq,T}$ from each fan, so it would not be distinguishable as an intermittent source.

8.5 Therefore, the predicted noise rating level is 37 dB $L_{Ar,Tr}$; which meets with the planning condition criteria.

9 Conclusion

9.1 Based on the current development proposals it is calculated that the requirements of the Local Authority can be met and the planning condition can be discharged.

9.2 To meet the planning condition criteria, the following noise limits must be achieved:

- Total sound pressure level of 76 dB $L_{Aeq,T}$ within the basement plant room
- Total sound power level of the equipment within the existing hotel plant deck shall not exceed 90 dB L_{WA} .
- The sound power level of the individual room extracts shall not exceed 54 dB L_{WA} for each unit, running at the extract duty for kitchens and bathrooms.

10 References

- 1 Sandy Brown report reference 16354-R01-A, dated 17th August 2016.
- 2 Planning application 6/2016/1739/MAJ, Welywn Hatfield.
- 3 CadnaA environmental noise modelling software, version 2017, Datakustik GmbH.
- 4 ISO 9613: Acoustics - Attenuation of sound during propagation outdoors.

