Memo no:	NE8659-APX-02-ZZ-RP-YA-0006-P01 (Apex ref. 8769.10A)	**Date:**	09/09/24
Project:	Greenhead College, Kirklees Courtyard Infill	**Subject:**	Replacement AHU noise assessment (Addendum to NE8659-APX-ZZ-ZZ-RP-YA-0004-P01)
To:	Rebecca Cole Galliford Try Building (GTB)	**From:**	Prepared by Kaelyn Tan; Reviewed by Silvio Murgia

Greenhead College, Huddersfield – Courtyard Infill

RE: Planning Conditions ref. Kirklees 2021/62/93674/W - Conditions 22 & 27

Two replacement AHU's. Plus, relocation of existing rooftop Condenser Units

<u>Addendum to Noise Impact Assessment Report (ref. NE8659-APX-ZZ-ZZ-RP-YA-0004 – as approved for discharge of Condition 22, ref. 2023/44/91192/E)</u>

1. Summary

1.1 The noise impact at residential receptors adjacent to the Greenhead College site predicted due to new AHU units has been predicted based on BS 4142 methodology with regard to relevant planning condition requirements as identified for the scheme approved in Decision Notice ref 2021/62/93674 – as appended.

1.2 Noise levels due to the replacement units at all residential receptors are calculated to be < 10 dB(A) and therefore well within the previously identified maximum BS 4142 plant noise rating limit of ≤ 35 dB $L_{AR,Tr}$, as approved by Decision Notice ref 2023/44/91192/E.

1.3 In addition, noise levels predicted due to the replacement AHU units are within recommended noise limits for avoidance of adverse impact at existing and new college buildings.

1.4 As part of the Courtyard Infill works, 8 no. existing rooftop condenser units are to be relocated by up to ~6 m to an area of the replacement roof. Based on the new location being of nominal change relative to the existing location, with potentially increased acoustic screening to residential receptors, any change in noise impact due to the relocation shall be negligible.

1.5 In summary, noise impact on residential amenity due to the proposed plant reconfigurations included in this assessment are predicted to be of negligible impact relative to the existing configuration.

2. Introduction

2.1 Replacement AHUs

2.2 Apex Acoustics has been commissioned to assess the noise impact associated with the replacement of existing Air Handling Units (AHU's) at the Courtyard Infill. This document is an addendum to plant noise impact assessment report (NE8659-APX-ZZ-ZZ-RP-YA-0004 rev P01 dated 17/03/2023).

2.3 It should be noted that the two new AHUs assessed are replacements for existing units previously operational close to the proposed new unit locations and that have been decommissioned.

2.4 Condition 22 references protection of amenity of neighbouring residents through managing of noise pollution. The noise impact assessment is based on the residential receptors adjacent to the site as the identified Noise Sensitive Receptors (NSR's).

2.5 In addition to assessment for planning condition requirements, College site receptors are also considered.

2.6 The assessment is based on the proposed plant details identified by the mechanical engineers and the potential noise impact from the sources identified is calculated and rated according to the BS 4142 methodology.

2.7 Relocation of existing rooftop condenser units

2.8 Consideration of potential for adverse noise impact at residential receptors due to the minor relocation of 8 no. existing rooftop condenser units has also been carried out.

2.9 The existing units are located at single-storey roof level of the existing building due to be replaced by the new Courtyard Infill extension. Due to replacement of the existing roof on which they are located as part of the new extension works, the units are to be relocated on and adjacent to the new roof by up to a maximum of ~6 m.

2.10 The new unit locations provide increased acoustic screening of the units for the majority of residential receptors as well as a nominal increase in the distance between them. See figures appended showing existing and proposed new locations.

2.11 On the basis of all units being the existing and of insignificant change in their location relative to residential receptors other than potentially increased acoustic screening, detailed assessment of potential for adverse noise impact due to the proposed unit relocation is not proposed to be required since noise impact changes at NSRs due to the relocation are likely to be imperceptible. No further assessment is included on this basis.

3. Noise criteria

3.1 Residential receptors

3.2 The plant noise limits are taken from the Apex plant noise impact assessment report approved for discharge of Condition 22. These were determined in accordance with West Yorkshire Planning Consultation Guidance Criteria and are reproduced in Table 1. The limits are based on an upper limit of 0 dB below the existing background L_{A90} and 10 dB below the ambient L_{Aeq}.

Assessment period	Representative Background Sound level, L_{A90} (dB)	Representative Ambient Sound Level, L_{Aeq} (dB)	BS 4142 Rating Level Limit, L_r (dB)
Daytime (07:00 – 23:00 hrs)	46	55	45
Night time (23:00 – 07:00 hrs)	35	45	35

Table 1: Background sound levels representative of the assessment periods

3.3 Receptors within the College site boundary

3.4 The internal ambient noise level (IANL) upper limits for a selection of typical room classifications described in BB 93 for new build spaces are shown in Table 2, along with the plant noise limits. The IANL upper limits are the combination of external noise sources (not related to the school's own activities) and building services noise.

3.5 The plant noise limits are set to achieve the IANL upper limits by assuming 15 dB reduction with opening windows.

BB 93 room description	Indoor ambient noise upper limit, $L_{Aeq,30min}$	Plant noise limit dB(A)
Secondary school classroom	35	50
Dining room	45	60

Table 2: IANL upper limits (BB93)

4. Noise sources

4.1 Proposed plant and associated noise levels

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

4.3 The location of all the units have been taken from the mechanical engineers' drawing as shown in Figure 1.

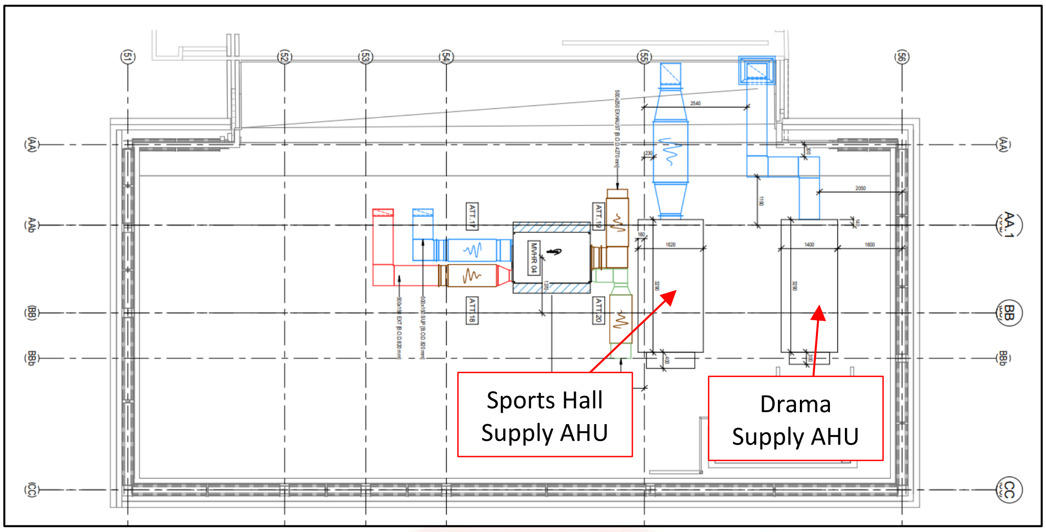

Figure 1: Proposed plant location (Courtyard Infill)

The proposed plant considered in the assessment is summarised in Table 3, along with the manufacturer supplied noise levels.

Plant	Data type	dB(A)	Single-octave band centre frequency (Hz) Linear noise levels (dB)							
			63	125	250	500	1k	2k	4k	8k
AHU.01, Fresh Air Intake (Sport Hall)	L_w	64	75	78	64	59	52	47	34	23
AHU.01, Casing (Sport Hall)	L_w	58	72	74	53	43	37	33	26	16
AHU.02, Fresh Air Intake (Drama)	L_w	63	63	75	64	60	53	49	36	26
AHU.02, Casing (Drama)	L_w	56	64	72	52	44	39	35	29	19

Table 3: Prosed plant and manufacturers noise levels

4.5 All plant is assumed to operate continuously during the daytime 1-hour and night-time 15-min assessment period; this is a prudent assumption.

5. Assessment results

5.1 Noise transmission and propagation is modelled to the NSR based on the noise source data detailed, using proprietary software, CadnaA.

5.2 The calculated noise contours is shown in Figure 2.

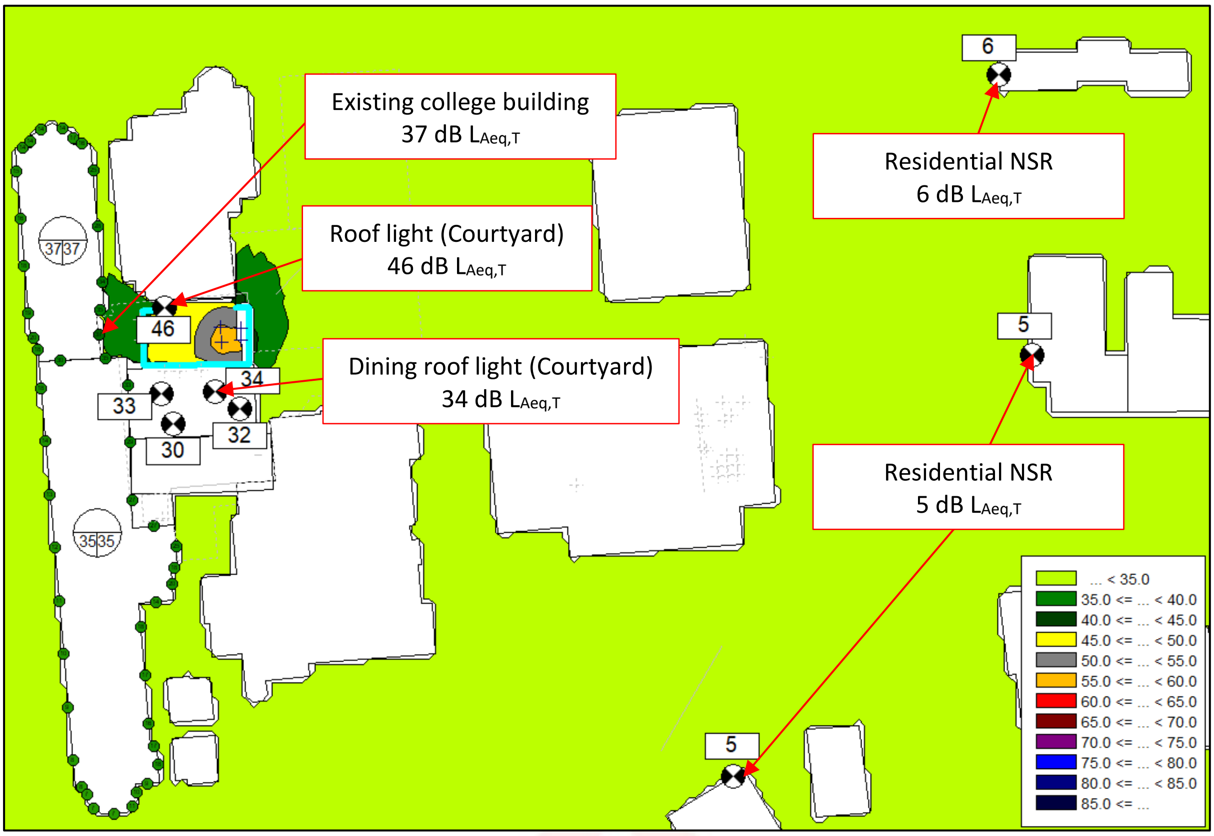

Figure 2: Sound contours at 4 m, showing the calculated specific level, $L_{Aeq,T}$

5.3 For the receptors within the College site boundary, the highest predicted noise level is 46 dB(A). With an assumption of an outside-to-inside level difference of 15 dB for an open window, the predicted internal noise level is 31 dB(A). This is below the most onerous indoor ambient noise upper limit of 35 dB(A) for a secondary school classroom as described in BB93, therefore meeting the requirements.

5.4 For all receptors outside of the College site boundary in particular, predicted noise levels of less than 10 dB(A) shall be practically inaudible and therefore well within all noise impact limits previously included in the original report.

6. Conclusion

6.1 Based on the modelling and assessment in accordance with BS 4142, it is predicted that noise impact levels due to the new AHUs at all identified receptors are within previously identified requirements included in Apex Plant Noise Impact Assessment report ref NE8659-APX-ZZ-ZZ-RP-YA-0004 rev P01 dated 17/03/2023 as approved for discharge of Planning Condition ref. 2021/62/93674 - Condition 22, at residential receptors adjacent to the site, and in addition at existing & new College buildings.

6.2 On the above basis, the noise impact calculated due to replacement and relocation of AHU's for the Courtyard Infill at Greenhead College meet all identified requirements.

7. Appendix A – Kirklees 2021/62/93674/W - Conditions 22 & 27

7.1 Planning Condition 22:

22. Prior to each of the hereby approved 'new main build' as shown on plan ref. 'NE8659-RYD-01-ZZ-DR-A-3600 rev. P8', and the 'courtyard infill' as shown on plan ref. NE8659-RYD-02-ZZ-DR-A-3602 rev. P7 being brought into use, all works which form part of the sound attenuation scheme for that building, as specified in the Apex Acoustics Noise Impact Assessment dated 26th November 2021 (ref: NE8659-APX-ZZ-ZZ-RP-YA-0002 rev. P06) shall be completed and written evidence to demonstrate that the specified noise levels have been achieved shall be submitted to and approved in writing by the Local Planning Authority. If it cannot be demonstrated that the noise levels specified in the aforementioned Noise Report have been achieved, then a further scheme shall be submitted for the written approval of the Local Planning Authority incorporating further measures to achieve those noise levels. All works comprised within those further measures shall be completed and written evidence to demonstrate that the aforementioned noise levels have been achieved shall be submitted to and approved in writing by the Local Planning Authority before each building is first brought into use
Reason: To protect the amenity of neighbouring residents through managing noise pollution, in accordance with Policies LP24 and LP52 of the Kirklees Local Plan.

Figure 3: Extract from Decision Notice – Condition 22

7.2 Planning Condition 27:

27. Prior to above-ground building works commencing, (excluding the demolition of existing structures and temporary car parking provision), a further noise assessment report by a suitably competent person shall be submitted to and approved in writing by the Local Planning Authority. The report shall include:

- An assessment of all of the noise emissions from the proposed development including (but not limited to) from the use of the sports pitches, car parking and mechanical plant;
- Details of existing background and predicted future noise levels at the boundary of the nearest noise sensitive premises;
- A written scheme of how the occupants of the above-mentioned noise sensitive premises will be protected from noise from the proposed development including details of all necessary noise attenuation; and
- Details of a scheme to minimise noise from the impact of balls against fencing and or enclosures.

Each phase of the development shall be implemented in accordance with the measures specified in the approved report and those measures shall be thereafter retained.
Reason: To protect the amenity of neighbouring residents through managing noise pollution, in accordance with Policies LP24 and LP52 of the Kirklees Local Plan.

Figure 4: Extract from Decision Notice – Condition 27

8. Appendix B – 8 no. existing rooftop condenser unit relocation positions

8.1 Existing plant location – in red:

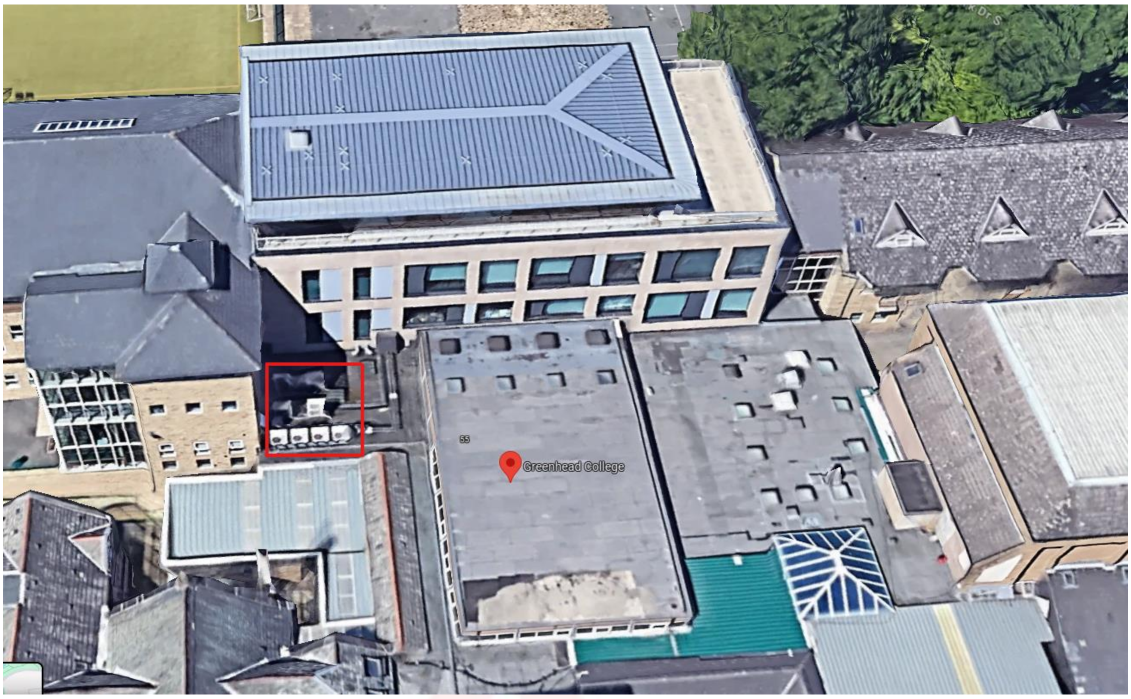

Figure 5: Existing rooftop condenser plant location

8.2 New plant location – in red (rotated ~ +45°):

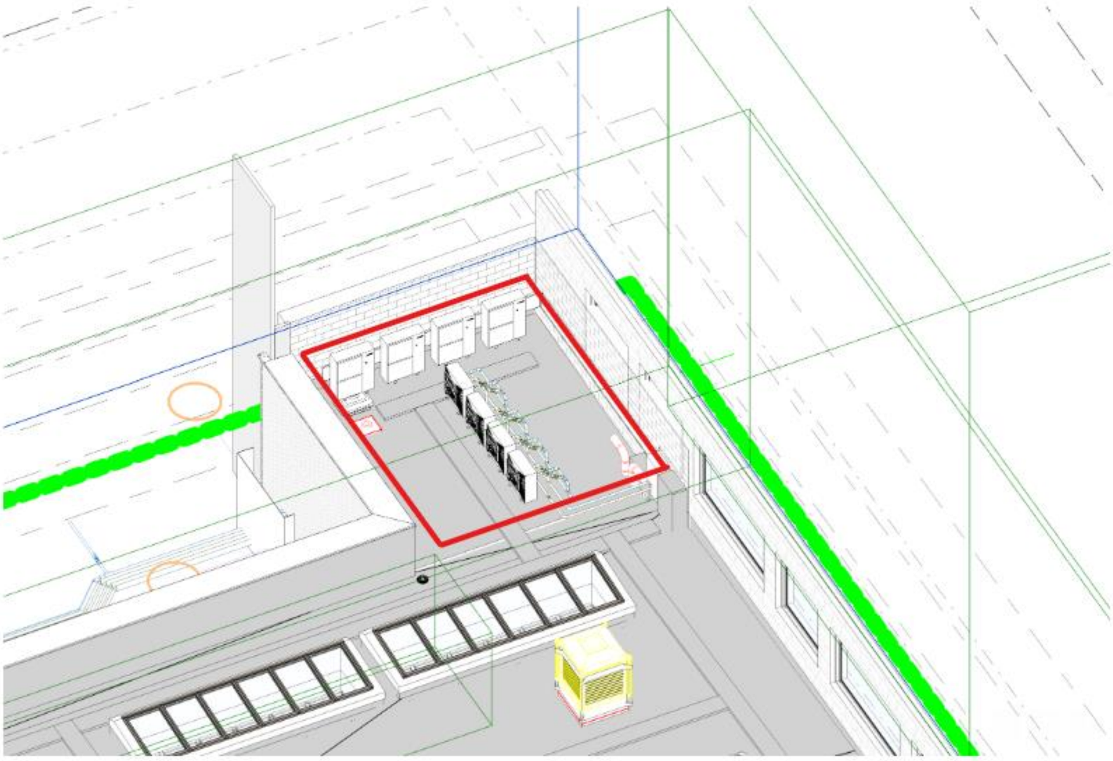

Figure 6: Proposed rooftop condenser plant location