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BY Email

TECHNICAL NOTE ON NOISE FROM AIR CONDITIONING UNITS LISTED BUILDING EXTENSION, LAYSTALL STREET, MANCHESTER

BACKGROUND & OBJECTIVES

E3P have been commissioned to produce a Noise Impact Assessment (50-194-R1-3) dated February 2021 for the proposed development at Laystall Street in Manchester. It is understood that since planning permission was granted, an extension to the listed building is proposed along with a new ventilation and heating/cooling strategy is proposed for this building which now includes Air Conditioning Units.

As such, the Environmental Health Department have requested consideration of noise impact from these units and, in particular, have requested that the following is achieved:

29) LISTED BUILDING – Prior to the occupation of the office accommodation a scheme for the acoustic insulation of any externally mounted ancillary equipment (including any Mechanical Ventilation Heat Recovery (MVHR) systems associated with the development to ensure that it achieves a background noise level of 5 dB below the existing background (LA90) at the nearest noise sensitive location shall be submitted to and approved in writing by the City Council as local planning authority in order to secure a reduction in the level of noise emanating from the equipment. The approved scheme shall be completed before the premises is occupied and a verification report submitted for approval by the city council as local planning authority and any non compliance suitably mitigated in accordance with an agreed scheme prior to occupation. The approved scheme shall remain operational thereafter.

Reason – To secure a reduction in noise in order to protect future residents from noise nuisance, pursuant to policies SP1, H1 and DM1 of the Core Strategy.



Laystall Street – Listed Building Extension

Technical Note on Noise from A/C Units

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As such, this Technical Note that considers the potential impact of noise from the air conditioning units upon existing/proposed residential receptors in the immediate vicinity in accordance with the above and BS 4142:2014+A1 'Methods for rating and assessing industrial and commercial sound'.

The technical note has been completed by Lee Faulkner, Associate Director at E3P, with over 13 years' experience in the measurement and assessment of noise and vibration. I hold the Post Graduate Diploma in Acoustics and Noise Control and I am a full corporate member of the Institute of Acoustics (MIOA).



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BASELINE NOISE LEVELS

In order to fully consider the potential for noise from the A/C units, existing background sound levels are required in order to compare the Rating Level and achieve the 5 dB below background sound levels.

The NIA completed by E3P did not include for background sound levels. However, an adjacent application on Lomax Street for Rain City Developments (Ducie Street) Limited included a Noise Impact Assessment Report conducted by Hann Tucker Associates (dated 25th April 2018) with background sound measurements conducted in a position to the rear of this development. As such, this position and associated baseline levels are considered representative.

Specifically, the following information has been taken from the report, as noted in Section 6, pages 6 to 8, the results of which are shown below:

Position	Daytime (07:00 – 23:00 hrs)		Night-time (23:00 – 07:00 hrs)		
	L _{Aeq,16h}	Typical Lowest L _{A90,15min}	L _{Aeq,8h}	Typical Lowest L _{A90,15min}	Typical Highest L _{Afmax,15min}
1	66 dB	54 dB	63 dB	54 dB	79 dB
2	58 dB	51 dB	58 dB	51 dB	73 dB

Position 2 is noted to be to the rear of Laystall Street and considered representative of background sound levels likely at future noise sensitive facades that are closest to the proposed A/C Units.

Accordingly, background sound levels are taken as 51 dB during the day, resulting in limits of 46 dB. It is assumed the A/C units would not operate at night; however the limit is equal to the daytime.



NOISE IMPACT ASSESSMENT

In order to consider the potential noise impact from the A/C units, E3P have undertaken 3D noise modelling of the units based on information provided by the client, specifically:

-  AC Unit Plan – L00 (L0316).
-  Air Conditioning Technical Data RXM-R – Sound Power Level of 63 dB.
-  Air Conditioning Technical Data RZAG-MV1 – Sound Power Level of 70 dB.
-  Air Conditioning Technical Data ARXM-R – Sound Power Level of 65 dB.

With regard to assumptions for the assessment, the following has been considered for the full planning application aspects:

-  Ground elevations have been taken as existing by way of a 2 m grid Digital Terrain Model (DTM) which contains public sector information licensed under the Open Government License v3.0.
-  The proposed x m high wall is included with 0 dB absorption and set as reflective.
-  Reflection order of 1 allowed for as per CadnaA recommendations; and
-  No soft ground attenuation has been applied.

For the BS 4142:2014+A1:2019 assessments, penalties are applied to the specific sound level in order to provide the rating level. Given that the sources of noise are A/C units and that the receptors are inside, no penalties are applied in this instance as it is assumed that there would be no tonal elements to the noise, nor any intermittency or impulsivity. As such, the output from the noise model can be considered the Rating Level.

Table 1 details the resultant rating level at the closest facades, output from the model. The grid noise map can be seen in Figure 1 of Appendix I.

As discussed, the lowest average background sound level is applied, in this case 51 dB, to all receptors. This informs a worst-case assessment.

TABLE 1 BS 4142:2014+A1:2019 ASSESSMENT – DAYTIME

RECEPTOR	CALCULATED RATING LEVEL, $L_{A,r}$ (dB)	BACKGROUND SOUND LEVEL, $L_{A90,1hr}$ (dB)	CRITERION, $L_{A,r} = L_{A90} - 5dB$ (dB)	DIFFERENCE +/- (dB)
Existing to East	36	51	46	-10
Proposed to South	46	51	46	0

Table 1 indicates that the predicted rating level falls below the criterion for receptors to the east and achieves for those to the south. As such, no adverse impact is predicted and the above shows compliance with the MCC criterion.



Laystall Street – Listed Building Extension

Technical Note on Noise from A/C Units

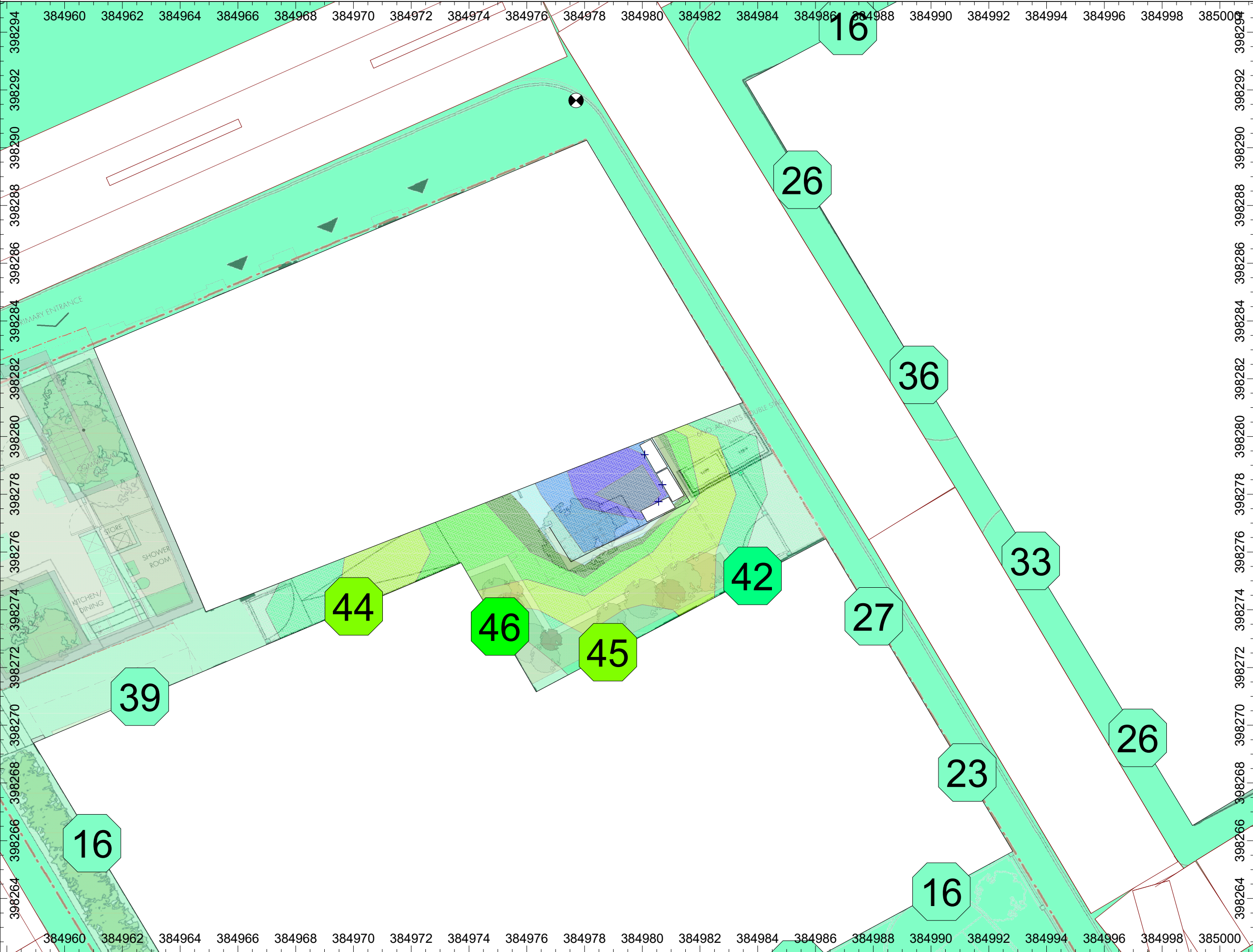
November 2023

Yours sincerely,
For and on behalf of E3P Ltd

Lee Faulkner
Associate Director



Figure 1 - Daytime Grid Noise Map - Calculation at 1.5m above ground level



Project:
Laystall Street,
Manchester

Project-No:
50-194

Client:
McCauls

**Rating Level,
LA,r (dB)**

...	<= 40
40 < ...	<= 42
42 < ...	<= 45
45 < ...	<= 48
48 < ...	<= 50
50 < ...	<= 52
52 < ...	<= 55
55 < ...	<= 58
58 < ...	

Noise Map Objects

- + Point Source
- vert. Area Source
- Road
- Building
- Barrier
- Bridge
- Contour Line
- Receiver
- Building Evaluation
- Calculation Area

e3p

Project Engineer: L Faulkner
Date: 23/11/2023