

Ref: 51-119-R2-1
Date: 24th April 2024

KW TOWERS LTD

The Le Gallais Building
54 Bath Street
St Helier
JE1 1FT

BY Email

TECHNICAL NOTE – DISCHARGE OF PRE-COMMENCEMENT CONDITIONS PART B WORTHINGTON HOUSE, DIDSBURY

1. BACKGROUND

E3P have been commissioned to provide evidence to discharge a pre-commencement condition set by Manchester City Council at Worthington House, Didsbury. The condition is part b of condition 3. E3P provided a Technical Note to partially discharge this condition, specifically part a):

a) Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5dB (LAeq) below the typical background (LA90) level at the nearest noise sensitive location. Prior to installation of the equipment the scheme 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 site. The scheme shall be implemented in full before the use commences or as otherwise agreed in writing by the City Council as local planning authority.

This part was subsequently discharged successfully and, as such, this Technical Note aims to provide evidence in order to discharge part b):

'Within three months of the operation of the scheme a verification report shall be submitted to and approved in writing by the City Council as local planning authority to validate that the work undertaken throughout the development conforms to the recommendations and requirements in the approved acoustic report. The report shall also undertake post completion testing to confirm that the noise criteria have been met. Any instances of non-conformity with the recommendations in the report shall be detailed along with any measures required to ensure compliance with the agreed noise criteria.'

As such, E3P have undertaken a BS 4142:2014+A1:2019 survey of the operational plant during full operation and daytime hours (07:00-18:00 Monday to Friday).



2. SURVEY AND ASSESSMENT

E3P had previously undertaken background sound measurements at the site and conducted a BS 4142 assessment. A sound power level of 83 dB was used for the plant item as stated in the manufacturer's specification sheet. An assessment for residential dwellings and office space was conducted with both determining no adverse impact due to its operation.

Accordingly, this sound power level is used as a baseline with a sound pressure level at 1 m of no more than 75 dB $L_{Aeq,T}$ expected given the previous assessment.

As measurements at the receptor locations are not possible, due to access and likely inaudibility of the plant over the residual sound level, source measurements around the units are considered acceptable.

The previous assessment determined a feature correction of 3 dB for 'other' with tonality unlikely. This will also be considered here.

2.1. SOURCE SOUND MEASUREMENTS

E3P has undertaken attended source measurements whilst the plant was operating at 100% capacity in order to inform a worst case assessment during daytime hours.

The survey was carried out over the following time periods:

 08:36-08:52 Wednesday 24th April 2024.

The following Noise Measurement Position was used:

 Noise Measurement Position 1 (NMP1): Located 1 m from the side of the unit with the microphone elevated above the roof level to 2 m in order to have line of sight to the table top fans on the unit. The noise from the unit was dominant and steady state.

Table 2.1 details the measured source sound levels.

TABLE 2.1 SOURCE SOUND MEASUREMENTS

MEASUREMENT PERIOD	MEASURED SPECIFIC NOISE LEVEL, $L_{Aeq,1min}$ (dB)
08:36	69.9
08:37	70.1
08:38	70.5
08:39	70.0
08:40	70.3



MEASUREMENT PERIOD	MEASURED SPECIFIC NOISE LEVEL, $L_{Aeq,1min}$ (dB)
08:41	70.7
08:42	71.4
08:43	70.6
08:44	70.6
08:45	70.7
08:46	70.7
08:47	70.8
08:48	70.8
08:49	71.4
08:50	66.8

The following equipment was used.

TABLE 2.2 NOISE MEASUREMENT EQUIPMENT AND CALIBRATION DATES

MEASUREMENT POSITION	EQUIPMENT DESCRIPTION	MANUFACTURER & TYPE NUMBER	SERIAL NUMBER	CALIBRATION DUE DATE
NMP1	Sound Level Meter	01dB Fusion	14226	28th July 2025
	Pre-amplifier	01dB Pre22	2135072	
	Microphone	GRAS 40CE	470570	
	Calibrator	Cirrus CR515	99204	3rd August 2024

The average specific noise level during this 15 minute period was 70.6 dB, rounded to 71 dB at 1 m.

As stipulated previously, an assumed sound pressure level of 75 dB at 1 m was modelled and assessed which determined no adverse impact.

As such, the measurements have verified that the sound emission from the plant is lower than modelled and assessed thus verifying the assessment.

Lastly, E3P have considered the potential for tonality from the unit and, as such, an objective analysis, as prescribed in BS 4142 has been undertaken for the measurement. This returned a 'k' correction factor of 0 dB. As such, the 3 dB 'other' correction is considered accurate and applicable.

Accordingly, the measurements have shown compliance with the assessment and in fact determined lower than expected noise levels from the plant.



To further support this, the BS 4142 assessment has been repeated with the measured values, as shown below.

2.2. DAYTIME ASSESSMENT

TABLE 2.2 WORST-CASE DAYTIME BS 4142 ASSESSMENT

RESULTS		RELEVANT CLAUSE	COMMENTARY
Sound Power Level of the ASHP	79 dB	7.1 7.3 7.3.6	Derived from measured values and taken from original assessment using manufacturer's specification sheet. 'Mitsubishi Electric R32 e-series Modular Chiller Range: Cooling Only or Heat Pump (150/180kW)'
Residual sound level	N/A	7.3.3 7.3.5	N/A
Background sound level	54 dB $L_{A90,1hr}$	8.1.3 8.3 8.4 8.5	E3P have taken the lowest measured daytime background to inform a worst-case assessment.
Assessment made during the daytime, so reference time interval is 1 hour		7.2	
Specific sound level	33 dB $L_{Aeq,1hr}$	7.3.4 7.3.5 7.3.6 7.3.7	Measured source was 4 dB lower than originally modelled and so the original predicted value is corrected as such.
Acoustic feature correction	3 dB	9.2	3 dB due for 'other' due to source likely being readily detective against the background
Rating level	36 dB $L_{A,r}$	9.2	Specific sound level + acoustic feature correction.
5 dB Below Background sound level	$L_{A90,1hr} =$ $(54 - 5) =$ 49 dB	8	Manchester City Council require 5 dB below the background
Excess of rating over background sound level	$(36 - 49)$ dB = -13 dB below	11	The closest façade to the plant would experience rating levels 13 dB below the background sound level criterion.



RESULTS		RELEVANT CLAUSE	COMMENTARY
Assessment indicates likely indication of a significant adverse impact, depending on the context		11	The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.
Uncertainty of the assessment	Not significant	10	The consideration of uncertainty, likely to be approximately 1 dB does not alter the outcome of the assessment and the rating level is still unlikely to exceed the background sound level even when considering this.

2.3. BS 8233 OFFICE NOISE IMPACT ASSESSMENT

In order to assess the potential impact of fixed plant sound on the nearby office windows, E3P have considered the internal criteria stipulated in BS 8233:2014+A1:2019. Specifically, the following criterion will be applied:

 Open Plan Office – Design range of 45-50 dB.

Therefore, E3P have outputted the façade noise level from the noise model at the closest window. The model has predicted a sound pressure level of 63 dB at the closest window which is corrected to 59 dB following the measurements. With windows open (13 dB attenuation), internal noise levels are expected to be approximately 46 dB which falls below the upper criterion of the design range above.

As such, no adverse impact is predicted at existing surrounding office buildings as a result of the operation of the plant.



3. CONCLUSION

E3P have been commissioned to carry out post completion testing and verification to discharge part b of condition 3 in relation to noise generated from the installed ASHP at the existing Worthington House office building in Didsbury.

As such, E3P have undertaken attended surveys of the plant operating at full capacity demonstrating a worst-case scenario in accordance with BS 4142:2014+A1:2019.

It was found that the plant was operating at a lower level than previously assessed, -4 dB, and so the no adverse impact determined previously is supported and verified.

Indeed, it was found that the daytime rating level falls well below the background sound level criterion set by Manchester City Council. Given this, no adverse impact is predicted day at residential receptors when the ASHP is operational.

With regards to office space, internal noise levels are expected to achieve all relevant criterion. As such, no adverse impact is predicted at existing office spaces as a result of the operation of the plant.

I trust this provides sufficient information in order to discharge the post-operation condition but please do not hesitate to contact me should you require further information.

Yours sincerely,
For and on behalf of E3P Ltd

Lee Faulkner
Associate Director

