



DDN-AC-01

DATE:	07 December 2022	CONFIDENTIALITY:	Public
SUBJECT:	Condition 16 - Fixed Plant Noise Emissions		
PROJECT:	Unit 2 Icon World Logistics Hub	AUTHOR:	Beth Paxton
CHECKED:	Mark Hinds	APPROVED:	Mark Hinds

INTRODUCTION

Overview

Manchester City Council has granted planning permission for a class B8 warehouse with ancillary office accommodation, service yards, car parking and landscaping at Unit 2, Icon World Logistics Hub, Sunbank Lane, Manchester. The planning application reference is 124266/FO/2019.

Condition 16 associated with the consent relates to noise and states:

“16) 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 (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

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 approved scheme shall be completed before the premises is occupied.

Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site, pursuant to policy DM1 (Development Management) and policy SP 1 (Spatial Principles) within Manchester Core Strategy.”

The nearest noise-sensitive receiver (NSR) to the site is the residential property approximately 290 m from the western corner of the site on Sunbank Lane. Figure 1 shows the site location outlined in red and the NSR

Figure 1: Site location and NSR



Criteria

Background sound level measurements were carried out in June 2019 by BWB Consulting to inform the noise assessment that accompanied the planning application for the development¹. Representative background sound levels and the resulting noise limits for external plant are summarised in Table 1.

Since operational noise from the site, including HGV movements, loading and unloading activities, were assessed previously by BWB, the noise limits in planning condition 16 are understood to refer only to fixed mechanical plant.

Table 1 – Fixed plant noise emissions criteria

Period	Representative background noise level, dB L _{A90}	Plant noise emission limit, dB L _{Ar} , Tr
Daytime (07:00 – 23:00 hrs)	44	39
Night-time (23:00 – 07:00 hrs)	44	

¹ BWB Consulting, Noise Impact Assessment Icon Unit 2, Manchester Airport, Manchester, June 2019.

PROPOSED PLANT

The following noise generating fixed plant items have been installed:

- Toilet extract fans (TEF) x 4
- Air handling units (AHU) x 3
- Heat recovery units (HRU) x 3
- External condensers (CU) x 3

Manufacturer noise data for these plant items is presented in Table 2. Ducted plant items have been fitted with attenuators which provide the insertion losses in Table 3. The total calculated sound power level of all external plant including attenuators is 86 dB L_{WA} .

Table 2 – Plant noise data

Plant Item	Description	Sound Power Level (SWL, dB) at Octave Band Centre Frequency (Hz)								dBA
		63	125	250	500	1k	2k	4k	8k	
TEF/A	In-duct outlet	53	51	59	60	62	65	60	52	69
TEF/B	In-duct outlet	47	46	54	55	57	60	55	47	64
TEF/C	In-duct outlet	49	48	56	57	59	62	57	49	66
TEF/IN	In-duct outlet	61	50	64	51	50	50	47	41	58
HRU/ME1,2 HRU/GH/01,02 ¹	In-duct intake	-	65	64	56	48	43	47	46	59
	In-duct exhaust	-	73	76	74	68	63	56	51	75
AHU/1-3	In-duct intake	94	93	102	92	90	86	84	78	97
CU GF ²	Unit free-field	69	76	71	65	64	62	53	47	70
CU 1F ²	Unit free-field	74	70	69	66	63	59	55	46	68
CU 1F meeting ²	Unit free-field	67	67	65	61	55	51	44	39	62

¹ Manufacturer noise data for HRU/ME/1 and 2 has also been adopted for HRU/GH/01 and 02 since no in-duct noise data was available for these units. This is considered prudent since HRU/GH/01 and 02 deliver lower air volumes. Assessment uncertainty is discussed below.

² Sound power levels for the condensers are calculated from a measured noise spectrum at 1 m based on a parallelepiped measurement surface in free-field measurement conditions.

Table 3 – Attenuator insertion losses

Location	Insertion Loss (D_i , dB) at Octave Band Centre Frequency (Hz)							
	63	125	250	500	1k	2k	4k	8k
TEF/A,B,C Exhaust	2	3	7	18	25	19	17	13
TEF/IN Exhaust	1	2	6	16	23	19	17	12
HRU/ME1,2 Intake / Exhaust	2	5	9	18	26	21	18	11
HRU/GH 01,02 Intake / Exhaust	1	2	6	16	23	19	17	12
AHU Intake	5	9	14	19	25	19	16	10



FIXED PLANT NOISE EMISSIONS ASSESSMENT

Calculation assumptions

A worst-case calculation of rating levels at the nearest noise-sensitive receiver has been carried out based on the following assumptions:

- A source to receiver distance of 340 m has been assumed for all plant. This is the minimum distance between the warehouse building and the nearest noise-sensitive receiver (the building is offset from the site boundary).
- No attenuation for screening by the building or terrain has been applied for any of the noise sources.
- Hard ground is assumed between source and receiver.
- AHU intakes are assumed to be outside the building. In practice, the AHUs take fresh air from an internal plenum with louvres to the outside, meaning that there will be additional noise losses within the plenum.
- No character correction has been added to the calculated specific sound levels since noise emissions from the plant is not anticipated to be tonal or impulsive.

Assessment

Table 4 summarises the plant rated sound level calculated at the nearest noise-sensitive receiver to the development. The fixed plant installed at Unit 2 of the Icon World Logistics Hub readily complies with the limits from planning condition 16.

Table 4 – Fixed plant noise assessment

Location	Plant noise emission limit, dB L _{Ar, Tr}	Calculated fixed plant noise levels, dB L _{Ar, Tr}	Complies?
NSR – Sunbank Lane	39	27	✓

Uncertainty

There is a large margin of compliance with the planning condition limits based on the conservative assessment assumptions set out above. Hence, it is considered that uncertainty associated with the assessment is highly unlikely to affect the outcome.

I trust the above is clear. If you have any further queries, please do not hesitate to contact me.

Yours faithfully

Beth Paxton

Senior Engineer - WSP Acoustics

beth.paxton@wsp.com

T: +44 (0) 191 226 2370