

40 Chorlton Street

Acoustic Report to Discharge Condition 16 of Decision Notice 120392/FO/2018

Date: 24 March 2021

Client Name: Seddon Construction

Document Reference: WIE13555-100-TN-210323 Condition 16

This document has been prepared and checked in accordance with Waterman Group's IMS (BS EN ISO 9001: 2015, BS EN ISO 14001: 2015 and BS EN ISO 45001:2018)

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1. Introduction

Planning permission was granted in August 2018 for the redevelopment of 40 Chorlton Street to provide an apart hotel (Use Class C1) with restaurant and bar use at ground floor (Use Class A3/A4). Planning permission was granted under Decision Notice 120392/FO/2018 subject to a number of planning conditions. Condition 16, the subject of this note, pertains to noise associated with fixed mechanical plant, the conditions is reproduced below.

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.

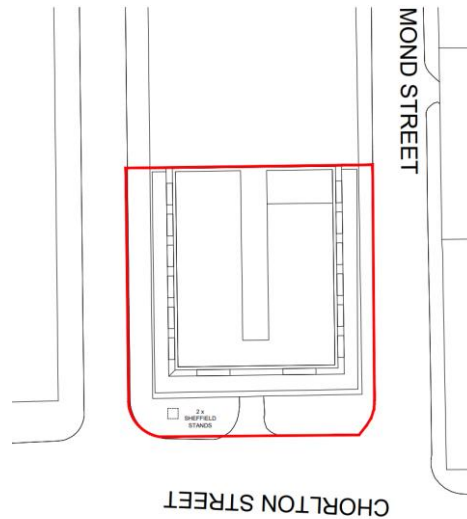
Reason - To minimise the impact of the development and to prevent a general increase in pre-existing background noise levels around the site.

This report prepared by Waterman Infrastructure & Environment Limited (hereafter 'Waterman') has been prepared to allow Condition 16 to be discharged.

2. The Site

The development is located at 40 Chorlton Street Manchester and is bound to the north east by Chorlton Street to the south by Canal Street, to the south west by 10 Chorlton Street and to the north by Richmond Street. The location of the development is presented as Figure 2-1.

Figure 2-1 Site Redline Boundary



3. The Development

The development includes for the provision of a restaurant/bar (Use Class A3/A4) although at this stage this area would be provided as shell and core only. Above ground floor there would be six floors providing apart-hotel bedrooms. The key plant area associated with the operation of the development is located within an external plant room at Level 6 as shown in Figure 3-1. A 3-dimensional view of the plant room is presented as Figure 3-2.

Figure 3-1 Level 6 Plant Room Location

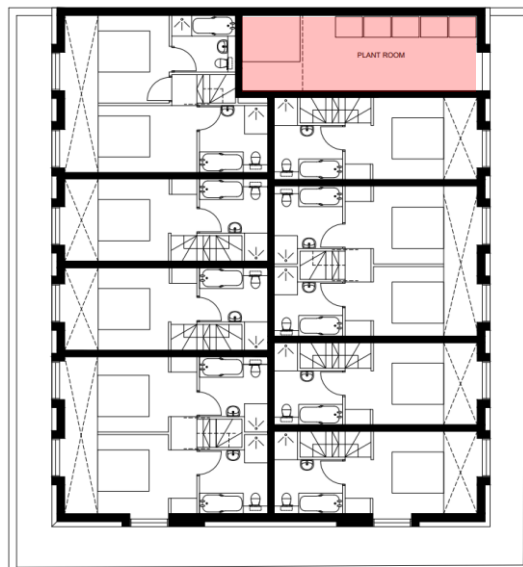
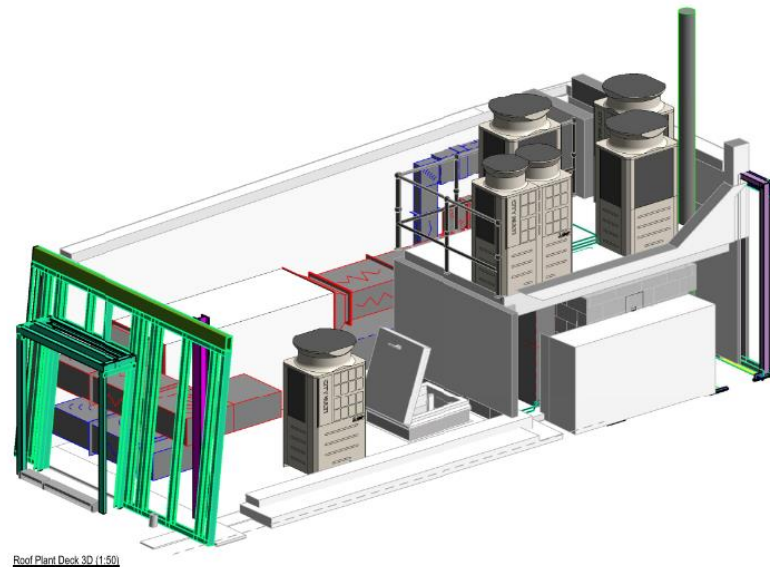


Figure 3-2 3-dimensional view of plant area



4. Baseline Conditions

4.1 Noise Sensitive Receptors

A review of the site and its surrounds has been completed and the closest noise sensitive receptors identified. The closest identified noise sensitive receptors are presented as Table 4-1.

Figure 4-1 Noise Sensitive Receptors

Receptor	Type of Receptor	Description / Name	Approximate Distance to Site Boundary (m)
NSR A	Commercial at ground floor, assumed residential above	30 Canal Street	Adjoining property
NSR B	School Facility	Manchester College, Shena Simon Campus	22 m Southeast of Canal Street façade
NSR C	Public House	37 Chorlton Street	19 m Northeast of Chorlton Street façade
NSR D	Commercial Property	16 Chorlton Street	9 m Northwest of Richmond Street façade

Although additional sensitive receptors are present these are further removed from the development than those identified in Figure 4-1, as such compliance with Condition 14 at NSR A would suggest compliance at all NSRs close to the development.

4.2 Baseline Noise Monitoring

A baseline noise survey was conducted from 30th November – 5th December 2017 to establish and quantify the existing noise climate on, and within the vicinity of, the development site.

Long-term monitoring was carried out on the site via two long term noise monitoring kits running concurrently; both were located on the second floor of the building (approx. 12m above ground level), one facing onto Canal Street and the other onto Richmond Street.

Full details of the monitoring locations can be found in Table 4-2.

Figure 4-2 Noise Monitoring Locations

Monitoring Location	Description	Observations and Predominant Noise Sources
LT1	Façade measurement on northern site boundary facing Richmond Street. Microphone situated approx. 12m AGL.	Noise climate dominated by road traffic noise from Chorlton Street and surrounding road network. Noise from external plant along Richmond Street contributed somewhat to the overall noise climate (constant, 50Hz), however, was not perceptible during set up. Noise climate during night-time period consisted of a mix of noise from traffic (Chorlton Street), nearby entertainment venues, pedestrians and noise from nearby plant.
LT2	Façade measurement on southern site boundary facing Canal Street Microphone situated approx. 12m AGL.	Noise climate dominated by road traffic noise from Chorlton Street and surrounding road network. Pedestrian passers-by contributed somewhat to the overall noise climate in the area. Noise climate during night-time period dominated by noise from nearby entertainment venues, pedestrians on Canal Street, and traffic noise from Chorlton Street.

All noise measurements were taken with calibrated precision grade (Class 1) frequency (third-octave band) sound level meters to provide a detailed description of the prevailing environmental noise characteristics. The sound level meters were set to record over consecutive 5-minute periods the L_{eq} , L_{90} , L_{10} , and L_{max} noise indices in the A-weighting network over a $125ms^{-1}$ fast response time constant interval for the duration of each survey. The indices are described in Appendix A of this report, but roughly translated they describe in turn the average, background, road traffic, and maximum noise level.

Full details of the instrumentation used for the noise measurements, including calibration certificates are available on request. Overall, weather conditions were ideal for the measurement of noise, it being fine and dry, with just a light wind from variable directions ($<5ms^{-1}$) prevailing.

A summary of the measured daytime (07:00 to 23:00 hour), night-time (23:00 to 07:00 hour) noise levels for the survey period are provided in Table 4-3.

Figure 4-3 Summary of unattended baseline noise measurements.

Monitoring Location (Table 1)	Day	Period	Duration	L _{Aeq,T} dB	L _{A10,T} dB	L _{A90,T} dB			L _{AFmax,5min} dB
				Ave ¹	Ave ²	Min	Ave ³	Max	95 th Percentile
LT1	Thursday	Night	8 hour	63	63	52	54	60	87
	Friday	Day	16 hour	65	66	54	57	63	87
		Night	8 hour	69	67	54	59	64	95
	Saturday	Day	16 hour	63	65	54	58	61	82
		Night	8 hour	67	69	56	62	64	89
	Sunday	Day	16 hour	64	65	55	57	63	83
		Night	8 hour	67	69	56	62	64	89
	Thursday	Night	8 hour	62	63	45	57	62	85
	Friday	Day	16 hour	64	65	52	57	66	86
		Night	8 hour	67	67	48	63	67	89
LT2	Saturday	Day	16 hour	67	67	48	57	65	96
		Night	8 hour	69	70	49	67	69	90
	Sunday	Day	16 hour	63	63	48	53	67	83
		Night	8 hour	63	63	46	58	62	86

Notes: ¹ Logarithmic average of measured values. ² Arithmetic average of measured values. ³ Modal average of measured values.

As the site does not exhibit the normal diurnal fluctuations in noise, i.e. it is louder during the night time than during the daytime; a combination of the highest 1-hour ambient noise level measured during the night time and the 95th percentile L_{max} octave band night-time noise levels will be used to assess noise ingress and calculate required façade performance.

5. Noise Impact Assessment

5.1 Design Criteria

Manchester City Council (MCC) requires that all 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 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.

Based on these requirements the plant limits are as specified in Table 5-1 below.

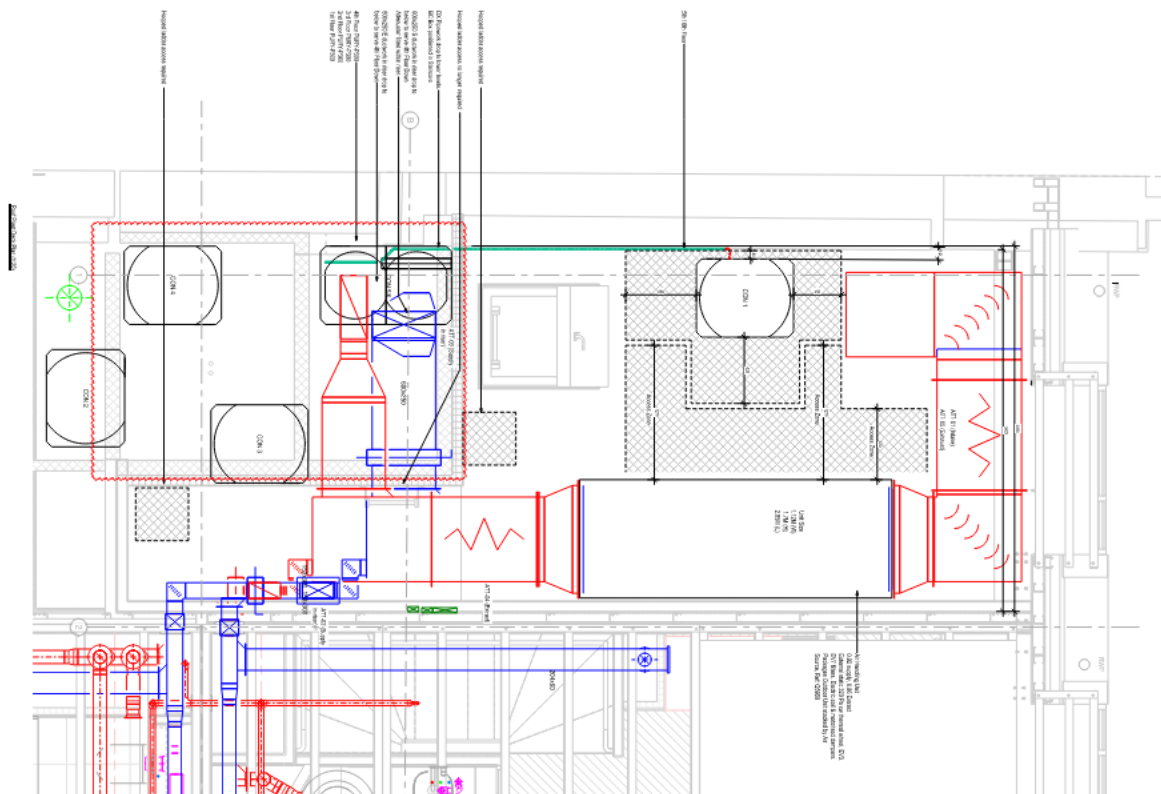
Table 5-1 Fixed Mechanical Plant Design Goal Noise Limits

Sensitive Receptor	Daytime Modal Average Background Noise dB L_{A90}	Daytime Noise Levels Limits dB $L_{Aeq,T}$	Night-time Modal Average Background Noise dB L_{A90}	Night-time Noise Levels Limits dB $L_{Aeq,T}$
All Receptors	57	52	54	49

5.2 Mechanical Plant Proposals

The proposed layout for the Level 6 external plant area is presented as Figure 5-1.

Figure 5-1 Rooftop Plant Area Layout



The unattenuated source noise levels for individual plant items are presented as Table 5-2. The acoustic performance of the proposed attenuators is presented as Table 5-3.

Table 5-2 Plant Source Noise Levels

Equipment Item	Number of Units	Octave Band Centre Frequency (Hz)							Overall Level (dBA)
		63	125	250	500	1000	2000	4000	
Airsource Air Handling Unit (Sound Power Level)	1	66	66	76	75	76	73	69	80
Mitsubishi P350 YNW-A VRF External Unit (Sound pressure level at 1m)	2	77	72	72	70	65	60	55	71
Mitsubishi P300 YNW-A VRF External Unit	3	76	63	63	60	54	50	45	61

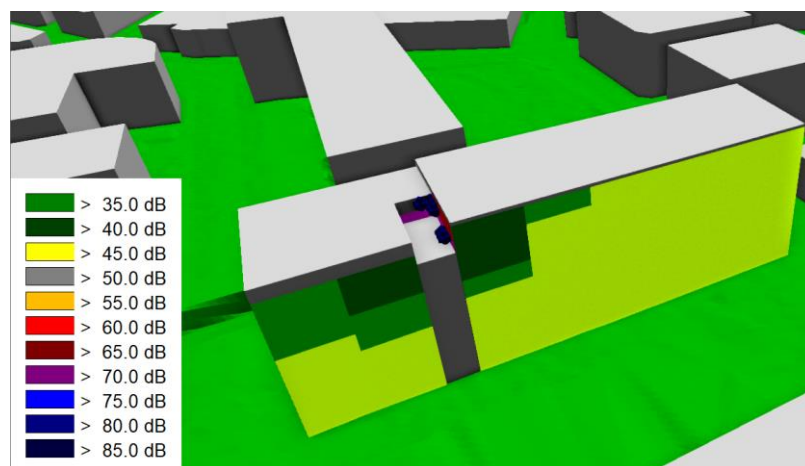
Table 5-3 Attenuator Minimum Insertion Loss

Attenuator		Octave Band Centre Frequency (Hz)						
		63	125	250	500	1000	2000	4000
Supply Inlet Attenuator	3	5	10	14	21	20	17	
Return Exhaust Attenuator	3	5	10	14	21	20	17	

5.3 Plant Noise Modelling

To allow noise levels as a result of plant to be determined a 3-dimensional noise model of the plant area and surrounding sensitive receptors has been developed using the software package CADNA-A. The model assumes the plant source noise levels presented as Table 5-2 and allows for attenuation provided by the installed attenuators and ductwork. It has been assumed that all plant would be operating simultaneously and at maximum duty throughout the daytime and night-time period.

Figure 5-2 CADNA A Noise Plot



5.4 Plant Noise Assessment

An assessment of the potential impacts of plant noise upon the closest residential receptors (NSR A) has been completed. The assessment results are presented as Table 5-4.

Table 5-4 Plant Noise Assessment

Results	Noise Level dBA	Relevant BS 4142 Clause	Commentary
Background sound level (night-time) $L_{A90,T}$	54 (modal L_{A90})	8	Obtained via measurement.
On time corrections	-	7.3.14	The on time of the plant items are understood to be fully operation during extreme (hot) weather conditions.
Specific sound level (Ls)	42	7.3.1	The highest predicted specific noise level Ls is predicted from noise model to be Ls 32 dB as shown in Section 5.3.1 and Figure 5.
Acoustic feature correction	3 dB	9.2	The plant items are likely to operate intermittently (3 dB).
Rating level (Specific + Acoustic feature) $L_{A,T,r}$	45 dB	9.2	
Excess of rating level over background sound level	$45 - 54 = -9$ dB (Using modal L_{A90})	11	
Assessment and Comments	Low impact likely to be perceived at NSRs adjacent to the proposed development		

The assessment results indicate that when operating simultaneously and at maximum duty the rating noise level associated with the proposed fixed mechanical plant would fall at least 5dB below the monitored background noise level at the nearest identified NSR. As such, it is considered that Condition 16 can be discharged.

6. Summary and Conclusions

An assessment of noise generated by the proposed fixed mechanical plant has been completed. The assessment results indicate that noise generated by fixed mechanical plant would fall at least 5dB below typical background noise levels with all plant operating simultaneously and at full duty. As such, Condition 16 can be discharged.