



Reference: 21-11-2022, M&S Uxbridge

Project No: 2221508

Technical Note 1

Re: Replacement plant, M&S Uxbridge

Introduction

- 1 Sharps Redmore (SR) has been instructed by Marks and Spencer (M&S) to undertake a noise assessment for replacement plant for the M&S Uxbridge, High Street store.
- 2 The aim of this Technical Note is to set plant noise rating limits for the mechanical services plant to be replaced. This information can then be used to assist in the design and selection of the mechanical services systems. It is understood that the 2no. existing refrigeration condensers are to be replaced.

Noise Survey Details

- 3 A noise survey was undertaken between 15:40 hours on Monday 14th and 01:40 hours on Tuesday 15th November 2022. The survey ceased at 01:40 hours due to an apparent issue with the batteries. A microphone was installed approximately 1.5 metres above ground level to measure sound pressure levels over consecutive 15-minute periods. The install measurement location is shown in Figure 1 below. The measurement location was chosen to be representative of the nearest noise sensitive receiver which are the residential properties to the north approximately 10 metres from the plant.
- 4 A few attended measurements were also taken on Monday 14th November at various locations around the existing plant.

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FIGURE 1: Measurement location



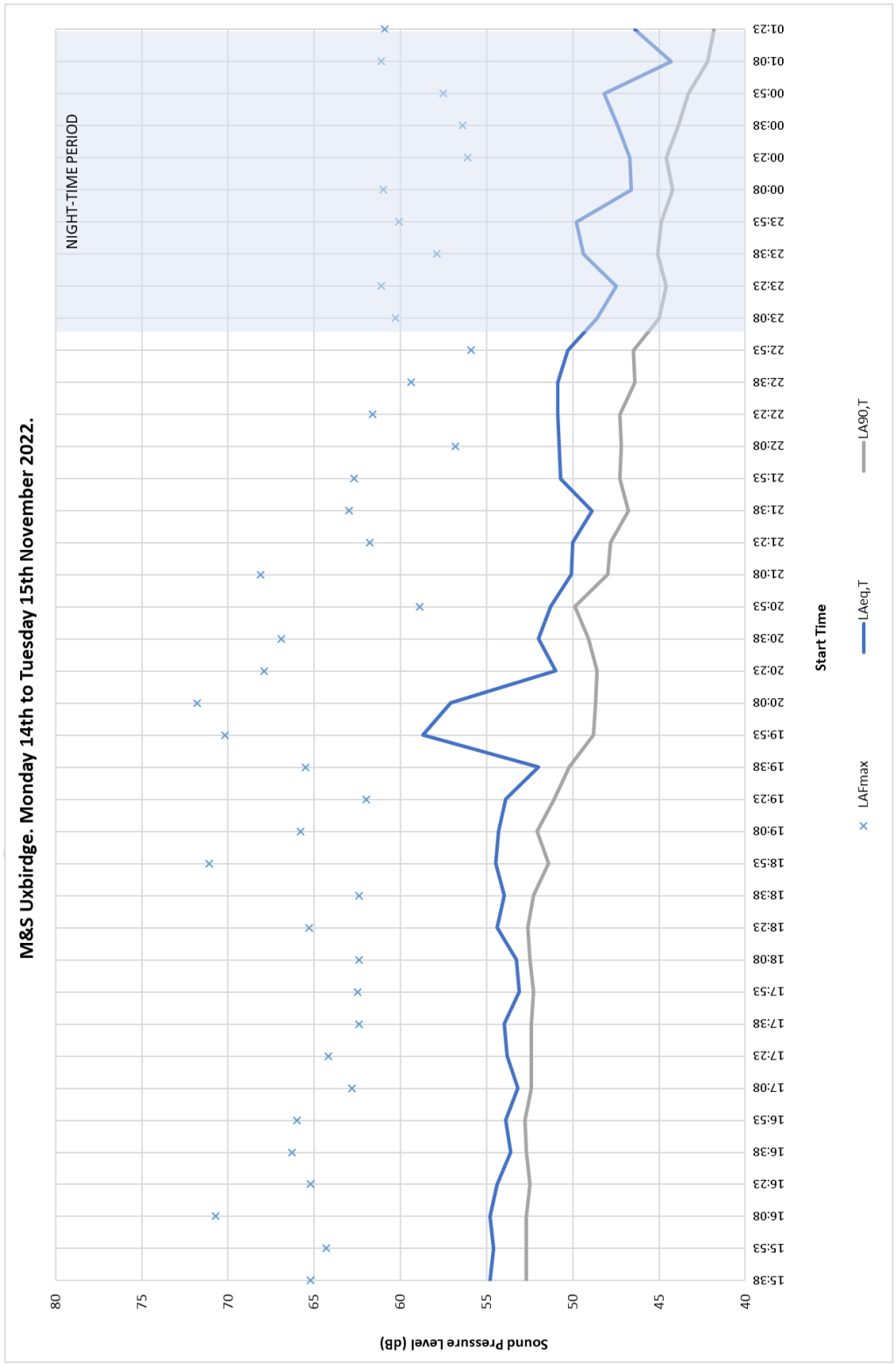
- 5 Noise levels were recorded using a Rion NL-52 Type 1 sound level meter which was calibrated before and after the survey with no drift in accuracy found. Weather conditions were suitable for taking noise measurements being dry and calm.
- 6 Whilst the majority of the survey was unattended during attended measurements, set up and retrieval, the noise climate consisted of existing plant, road traffic and occasional aircraft noise.
- 7 Table 1 and Figure 2 below presents a summary of the noise levels obtained.
- 8 The typical background noise level is 53 dB $L_{A90,1hr}$ during the day (0700-1900 hrs), 47 dB $L_{A90,1hr}$ during the evening (1900-2300 hrs) and 42 dB $L_{A90,15min}$ at night (2300-0700).

TABLE 1: Install Noise results – 14 to 15 November 2022

Date	Start Time	Noise Level dB		
		$L_{Aeq,T}$	L_{AFmax}	$L_{A90,T}$
Mon 14 Nov 22	15:38	55	65	53
Mon 14 Nov 22	15:53	55	64	53
Mon 14 Nov 22	16:08	55	71	53
Mon 14 Nov 22	16:23	54	65	53
Mon 14 Nov 22	16:38	54	66	53
Mon 14 Nov 22	16:53	54	66	53
Mon 14 Nov 22	17:08	53	63	52
Mon 14 Nov 22	17:23	54	64	52

Date	Start Time	Noise Level dB		
		L _{Aeq,T}	L _{AFmax}	L _{A90,T}
Mon 14 Nov 22	17:38	54	62	52
Mon 14 Nov 22	17:53	53	63	52
Mon 14 Nov 22	18:08	53	62	53
Mon 14 Nov 22	18:23	54	65	53
Mon 14 Nov 22	18:38	54	62	52
Mon 14 Nov 22	18:53	55	71	51
Mon 14 Nov 22	19:08	54	66	52
Mon 14 Nov 22	19:23	54	62	51
Mon 14 Nov 22	19:38	52	66	50
Mon 14 Nov 22	19:53	59	70	49
Mon 14 Nov 22	20:08	57	72	49
Mon 14 Nov 22	20:23	51	68	49
Mon 14 Nov 22	20:38	52	67	49
Mon 14 Nov 22	20:53	51	59	50
Mon 14 Nov 22	21:08	50	68	48
Mon 14 Nov 22	21:23	50	62	48
Mon 14 Nov 22	21:38	49	63	47
Mon 14 Nov 22	21:53	51	63	47
Mon 14 Nov 22	22:08	51	57	47
Mon 14 Nov 22	22:23	51	62	47
Mon 14 Nov 22	22:38	51	59	46
Mon 14 Nov 22	22:53	50	56	47
Mon 14 Nov 22	23:08	49	60	45
Mon 14 Nov 22	23:23	48	61	45
Mon 14 Nov 22	23:38	49	58	45
Mon 14 Nov 22	23:53	50	60	45
Tue 15 Nov 22	00:08	47	61	44
Tue 15 Nov 22	00:23	47	56	45
Tue 15 Nov 22	00:38	47	56	44
Tue 15 Nov 22	00:53	48	58	43
Tue 15 Nov 22	01:08	44	61	42
Tue 15 Nov 22	01:23	46	61	42

FIGURE 2: Graph of results



Noise from Mechanical Services Plant

- 9 The precise location and details of the replacement fixed plant equipment are to be finalised. SR understand that it is the refrigeration condenser units are to be replaced, see Figure 3 below. It should be noted that only one of these was running during the survey.

FIGURE 3: Current refrigeration condenser units to be replaced.



- 10 It was subjectively noted that the majority of the plant noise was coming from the large plant room and the refrigeration condenser units were hard to distinguish from the plant room noise.
- 11 Whilst the proposed plant is to be a direct replacement, based on our subjective view of the existing noise climate being dominated by the noise breakout from the plant room, to minimise any adverse impact from the replacement plant, a target of 10 dB below the existing noise climate is suggested.
- 12 In view of this and the measured noise levels, it is proposed that cumulative plant rating noise level limits of the replacement refrigeration condensers should be set at 40 dB daytime (0700 - 1900 hrs), 34 dB evening (1900 – 2300 hrs) and 29 dB at night (2300-0700 hrs), all at 10m. If 2 units are required, the target noise levels should be reduced by 3 dB.

Assessment Conclusions

- 13 Having undertaken this assessment, it is concluded that any replacement mechanical services plant installed should be designed such that it cumulatively achieves the suggested criteria in the table below at the nearest noise sensitive properties.

TABLE 2: Proposed cumulative mechanical services plant rating noise limits

Cumulative mechanical services plant rating noise limits at 10m (dB)		
Daytime	Evening	Night time
40	34	29

- 14 Using these rating noise limits, noise associated with any proposed mechanical services plant should avoid adverse impact at the nearest noise sensitive receivers.