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TECHNICAL MEMO

Project	Central Saint Giles Screen
To	Anthony Ellis, WePop
From	Robert Miller, F1 Acoustics Company Limited
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Reference	1861/TechnicalMemoNoise/Rev0

1 INTRODUCTION

F1 Acoustics Company Limited has been appointed by WePop to provide a baseline noise survey; source noise measurements; an assessment of entertainment noise levels; and this technical memo outlining the survey methodology, criteria and assessment, for a summer screen located in Central Saint Giles, London.

2 NOISE SURVEY METHODOLOGY

Noise surveys have been undertaken to measure the source sound levels of the screen during operation and baseline measurements without the screen operating. The attended noise survey was undertaken in the area of Central Saint Giles on Tuesday 11th July 2023. The source noise survey measured the screen in operation at maximum volume at 12 m from the screen with Wimbledon Tennis commentary and a baseline measurement without the screen operational at three locations around the area representative of the nearest noise sensitive premises.

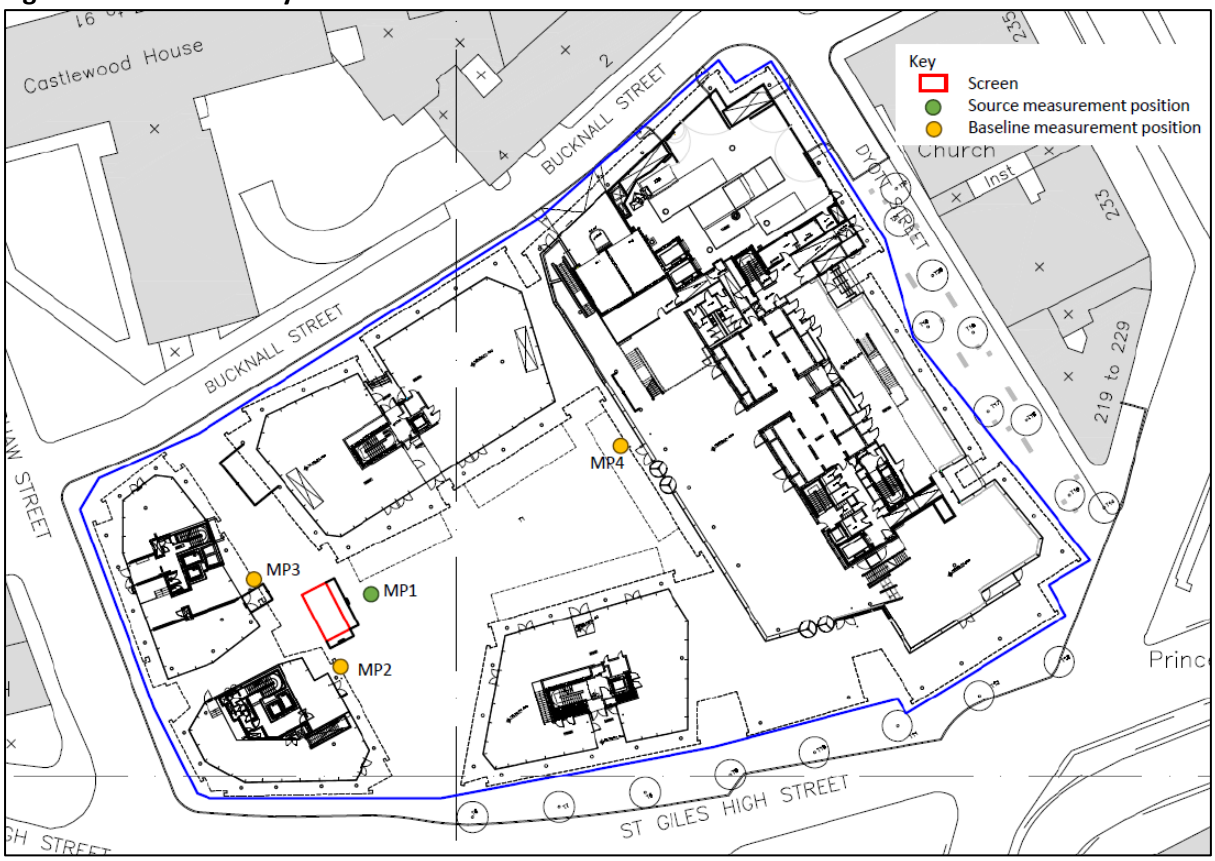
The noise surveys were undertaken with a Rion NL-52 class 1 sound level meter, which was checked for calibration before and after the surveys with a Rion NC-75 sound level calibrator. No significant deviation of the calibration levels were recorded (less than ±0.5 dB). Table 2.1 shows the noise measurement instrumentation details.

Table 2.1: Noise Measurement Instrumentation Details

Measurement	Sound Level Meter	Calibration Check at Start		Calibration Check at End	
		Sound Level Calibrator	Calibration Sound Level at 1 kHZ, dB	Sound Level Calibrator	Calibration Sound Level at 1 kHZ, dB
Source and Baseline	Rion NL-52 (F1AC-069)	Rion NC-75 (F1AC-070)	94.0	Rion NC-75 (F1AC-070)	94.0

The noise survey locations are presented in Figure 2.1.

Figure 2.1: Noise Survey Locations



A source sound level measurement of the screen was taken for a 5-minute period and 15 minute measurements were taken for the baseline sound measurements. The L_N (percentile sound level) is calculated from the $L_{p,100msec}$ (fast time-weighted).

The meteorological conditions were monitored throughout the duration of the noise survey. There were no periods considered unsuitable for noise monitoring during the survey.

3 NOISE SURVEY RESULTS

During the source noise measurement the tennis, commentary, ball and crowd from the screen were audible with restaurant and café customers chatting just audible and table tennis in the background. During the baseline noise surveys the piazza was quieter after some light rain, passing pedestrians, local road traffic noise from the A40 and distant construction work were audible. The attended noise survey results are presented in Table 3.1.

Table 3.1: Measured Noise Levels Tuesday 11th July 2023

Location	Start Time	Duration (T)	Ambient $L_{Aeq,T}$, dB	Background $L_{A90,T}$, dB
MP1	11/07/2023 13:13	5 min	67.1	61.7
MP2	11/07/2023 15:00	15 min	62.5	55.6
MP3	11/07/2023 15:20	15 min	60.4	55.3
MP4	11/07/2023 15:40	15 min	60.5	55.6

The results show that the screen sound level at 12 m in front of the screen is $L_{Aeq,5min}$ 67 dB. The baseline results show all three locations have similar ambient and background sound levels. The baseline sound levels were monitored after the lunch-time busy period representative of the afternoon/evening period. The average baseline ambient sound level in the piazza is $L_{Aeq,15min}$ 61 dB and the baseline background sound level is $L_{A90,15min}$ 56 dB.

4 RELEVANT NATIONAL GUIDANCE AND STANDARDS

Entertainment noise from screens has no specific guidance or standards to be assessed to, however the Code of Practice on Environmental Noise Control at Concerts (CPENCC) may be relevant considering the sources of noise are both identifiable and for the purposes of entertainment. In a footnote to Table 1 of the CPENCC discussing music noise level (MNL) limits it states:

> *"5. For indoor venues used for up to about 30 events per calendar year an MNL not exceeding the background noise by more than 5 dB(A) over a fifteen minute period is recommended for events finishing no later than 23:00 hours."*

As the screen is not used for music but primarily for the live screening of sporting events the nature of the sound will be less intrusive and therefore this proposed limit will be suitable for more than 30 days for screenings finishing before 23:00.

Therefore, the criteria for the entertainment noise sound level from the screen will be $L_{Aeq,15min}$ 61 dB at the nearest noise sensitive premises (5 dB above the average measured background sound level $L_{A90,15min}$ 56 dB).

5 ASSESSMENT OF MUSIC NOISE LEVELS

This assessment will seek to calculate the maximum sound level of the screen audio operating at the nearest noise sensitive premises and a comparison to the entertainment noise criteria.

To assess the entertainment noise level at the measurement positions representative of the nearest noise sensitive premises a distance correction calculation has been applied from the source measurement at 12 m using the equation:

$$L_2 = L_1 - 20\lg\left(\frac{r_2}{r_1}\right)$$

Where:
L_1 is the entertainment noise level measured in front of the screen;
L_2 is the entertainment noise level at the calculation location;
r_1 is the distance the entertainment noise was measured in front of the screen; and
r_2 is the distance to the calculation location.

Additional directivity and screening attenuation may also be added based on whether the receiving location is partially screened (-5 dB) or completely screened (-10 dB) from the speakers.

Table 5.1 shows the entertainment noise calculation and results.

Table 5.1: Entertainment Noise Calculation

Receptor Location	Source Entertainment Noise Level (L_1), $L_{Aeq,T}$, dB	Source Noise Level Distance (r_1), m	Receptor distance (r_2), m	Directionality and screening attenuation, dB	Entertainment Noise at Receptor Location (L_2 + directivity and screening correction), $L_{Aeq,T}$, dB
MP2	67	12	7.9	-10	61
MP3	67	12	11.9	-10	57
MP4	67	12	40.9	0	56

The results shown in Table 6.1 show that the screen on full volume will achieve the entertainment noise criteria proposed at the nearest noise sensitive premises. Based on this assessment the entertainment noise of the screen should not exceed $L_{Aeq,15min}$ 67 dB at 12 m from the screen.