Reference: Mecure Hotel, Bloomsbury
Project No: 2221235
Date: 8th June 2023

Technical note

Re: Noise survey of external AC condensers

- Planning consent for a development of the hotel was granted in 2020, Application Ref 2018/3876/P, subject to a number of planning conditions. Condition 4 of the planning consent states:

  "The total noise from fixed plant associated with the application site, when at a point 1m external to the nearest noise sensitive residential façade shall comply with the Acoustic Design Note (ref 18209/ADN002/js) ie be at least 45 dB LAeq (daytime hours) and 42 dB LAeq (night time hours) when all plant/equipment (or any part of it) is in operation unless the plant/equipment hereby permitted will have a noise that is distinguishable, discrete continuous note (whine, hiss, screech, hum) than the noise levels from the plant/equipment at any noise sensitive façade shall be at least 40 dB LAeq (daytime hours) and 37 dB LAeq (night time hours) ie 15 dBA below background noise level."

- As part of the proposed mitigation to reduce noise from the plant, the controls were set for the plant to operate quieter at night, as well as the introduction of a partial acoustic enclosure, to screen the plant from the nearest residential dwellings in Russell Mansions.

Figure 1: Acoustic enclosure

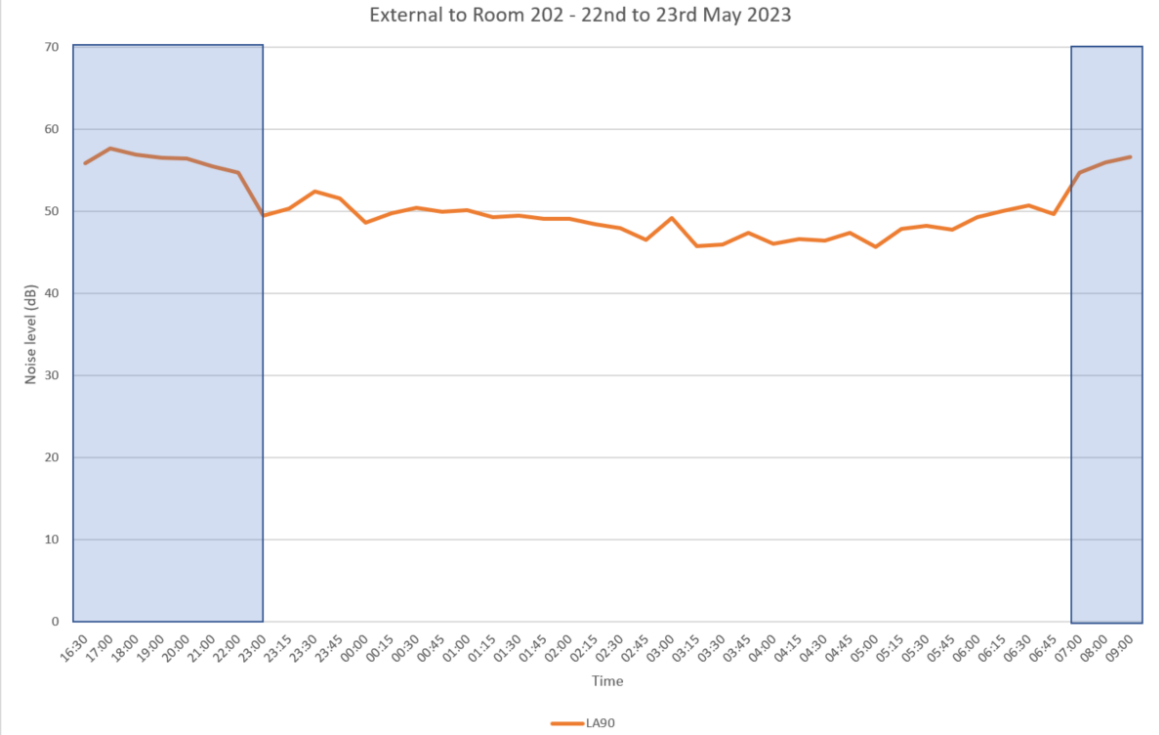
- As part of the original investigation into the noise from the installed plant, environmental noise surveys were undertaken with the microphone of a sound level meter, on a pole, from the nearest hotel room window, room 202. This survey was repeated between 22nd and 23rd May 2023.

- The survey was undertaken using a Norsonic 140 Type 1 sound level meter. The meter was calibrated before and after the survey with no signs of any drift. The meter was set-up to measure samples per hour during the day, and every 15 minutes through the night. The weather conditions were dry with a low wind speed as such would have no adverse impact on the survey results.

- To assess the noise from the plant, and minimise the impact of other extraneous noise sources, such as traffic, aircraft, distant construction noise etc, we have used the L_{A90} value, which is the value that is exceeded for 90% of the given time interval.

- The noise survey data external to hotel room 202 is presented below:

Figure 2: Survey data



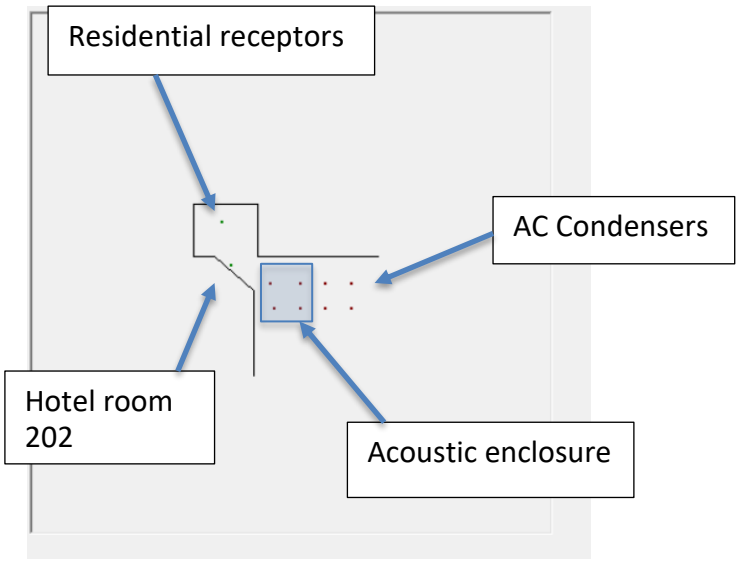
- The typical noise levels during the day are 56 dBA, and 49 dBA at night,.

- The survey location has direct line of sight to a number of the AC condensers, whereas the nearest receptor will be either screened by the enclosure, or screened by the building wall itself;

Figure 3: Line of light / screening

- To assess the difference in noise level at the receptor compared to that at the survey location external to the hotel, we have used in-house environmental acoustic modelling software, Noysplot. A sketch from the model is presented below:

Figure 4: Sketch from noise model



- Based on the modelling undertaken, in achieving 56 dBA at the survey location, equates to 45 dBA at the nearest residential property during the day, and at night, achieving 49 dBA at the survey location equates to 38 dBA at the nearest residential property. The summary of the predicted noise levels for day and night are presented below:

Figure 5: Daytime summary

Overall receptor listings
Period: Day time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Hotel 1st flr	71	61	59	57	50	47	43	38	58
Hotel 2nd flr (survey location) Rm 202	69	59	58	55	49	46	42	37	56
Hotel 3rd flr	67	57	56	53	47	44	40	35	54
Hotel 4th flr	65	55	53	51	45	42	38	32	52
Hotel 5th flr	63	53	52	50	43	40	36	31	51
Residential 1st flr	62	53	48	44	34	30	29	25	45
Residential 2nd flr	61	52	47	43	32	29	28	24	44
Residential 3rd flr	59	50	45	41	31	27	26	22	42
Residential 4th flr	56	47	42	38	28	25	23	19	39
Residential 5th flr	55	45	40	36	26	23	21	17	38

Figure 6: Night time summary

Overall receptor listings
Period: Night-time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Hotel 1st flr	64	54	52	50	43	40	36	31	51
Hotel 2nd flr (survey location) Rm 202	62	52	51	48	42	39	35	30	49
Hotel 3rd flr	60	50	49	46	40	37	33	28	47
Hotel 4th flr	58	47	46	44	38	35	31	25	45
Hotel 5th flr	56	46	45	43	36	33	29	24	44
Residential 1st flr	55	46	41	37	27	23	22	18	38
Residential 2nd flr	54	44	40	36	25	22	21	17	37
Residential 3rd flr	52	42	38	34	24	20	19	15	35
Residential 4th flr	49	40	35	31	21	18	16	12	32
Residential 5th flr	48	38	33	29	19	16	14	10	31

- As can be seen from the image in Figure 3, which was not previously identified as a receptor as part of the original noise report to accompany the planning application, there is a line of sight to the apartments in Queen Square, which is approx 30m from the location of the plant. Using the same noise data as that for the predictions above, and ignoring any benefit from the enclosure, the following noise levels are predicted:

Figure 7: Day time summary – Queen Square

Source noise levels at receiver: Queen Square
Period: Day time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
3rd flr PURY-P400	50	39	39	37	31	28	23	18	38
1st flr PURY-P400	50	39	39	37	31	28	23	18	38
2nd flr PURY-P400	50	39	39	37	31	28	23	18	38
5th flr PURY-P400	49	38	38	36	30	27	22	17	37
7th flr PURY-P300	43	38	37	34	29	25	20	16	35
6th flr PURY-P350	40	40	32	30	25	22	20	16	32
4th flr PURY-P350	40	39	32	30	25	22	20	16	32
Grd flr PURY-P250	38	32	31	29	23	19	20	13	30
Total Free field Lp and dBA	56	47	46	44	38	35	31	26	45

Overall receptor listings
Period: Day time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Queen Square	56	47	46	44	38	35	31	26	45

Figure 8: Night time summary – Queen Square

Source noise levels at receiver: Queen Square
Period: Night-time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
1st flr PURY-P400	43	32	32	30	24	21	16	11	31
3rd flr PURY-P400	43	32	32	30	24	21	16	11	31
2nd flr PURY-P400	43	32	32	30	24	21	16	11	31
5th flr PURY-P400	42	31	31	29	23	20	15	10	30
7th flr PURY-P300	36	31	30	27	22	18	13	9	28
4th flr PURY-P350	33	32	25	23	18	15	13	9	25
6th flr PURY-P350	33	32	25	23	18	15	13	9	25
Grd flr PURY-P250	31	25	24	22	16	12	13	6	23
Total Free field Lp and dBA	49	40	39	37	31	28	24	19	38

Overall receptor listings
Period: Night-time

	Mid frequency octave bands (Hz)								
	63	125	250	500	1k	2k	4k	8k	dBA
Queen Square	49	40	39	37	31	28	24	19	38

- Based on the mitigation provided, ie acoustic enclosure, and the controls put in place to operate the plant, the recent noise survey indicates compliance with the criteria specified in Condition 4 of application ref 2018/3876/P

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