
Environmental Noise Assessment, 3CR Annexe

Johnson Matthey

Royston

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Executive Summary

The Industrial Noise & Vibration Centre (INVC) has carried out an environmental noise assessment of the proposed new 3CR Annexe in support of their planning application.

The proposed development is in the industrial area, well away from the nearest residential housing to the east, and is therefore unlikely to cause any noise impact. However, the noise from the proposed development has been predicted at multiple positions around the site boundary, and compared with the existing measured background noise levels, in order to confirm that this is the case.

Bearing in mind that the noise predictions are worst-case, the results show that the noise from the new building will be at least 10 dB below the existing background noise level at the nearest residential housing, and will therefore only increase the existing background noise level by less than 0.5 dB, which is barely noticeable.

The only positions where there could be a noticeable increase in noise levels are those closest to the new building where the existing background noise level could increase by 1 or 2 dB, but this is in the industrial area, so is unlikely to be an issue.

It is recommended that the assumed source noise levels of all of the items of plant are included in the final specification of the new plant. If any items of plant do not meet the noise specification, then additional mitigation measures can be introduced before the plant is installed on site. The source noise levels will be checked during the full two-yearly environmental noise assessment of the site, and recommendations for mitigation will be provided if required.

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1.0 Introduction

The Industrial Noise & Vibration Centre (INVC) was requested by Richard Mensah of Johnson Matthey to carry out an environmental noise assessment of the proposed new 3CR Annexe in support of their planning application.

It is understood that Johnson Matthey has requested pre-application advice from the local planning authority, and has received the following comment:

“Johnson Matthey haven’t assessed the proposed development, simply repeated the numerous (10+) noise assessments at the site boundaries that they have undertaken before for Johnson Matthey. The officer notes that there are no details relating to the proposed development site, its location, proposed activities or an appropriate noise assessment. The officer advises that there are insufficient details to make an informed response and that a revised noise assessment is required to be submitted to include details of the location of the proposed development, associated activities and noise assessment which were not in the previous noise assessment.”

This report is intended to provide the relevant information, including an assessment of the predicted noise levels in comparison to the existing measured background noise levels in the area.

2.0 Proposed Development

The location of the proposed new 3CR annexe building (and the receiver positions used in the assessment) is shown in the figure below:

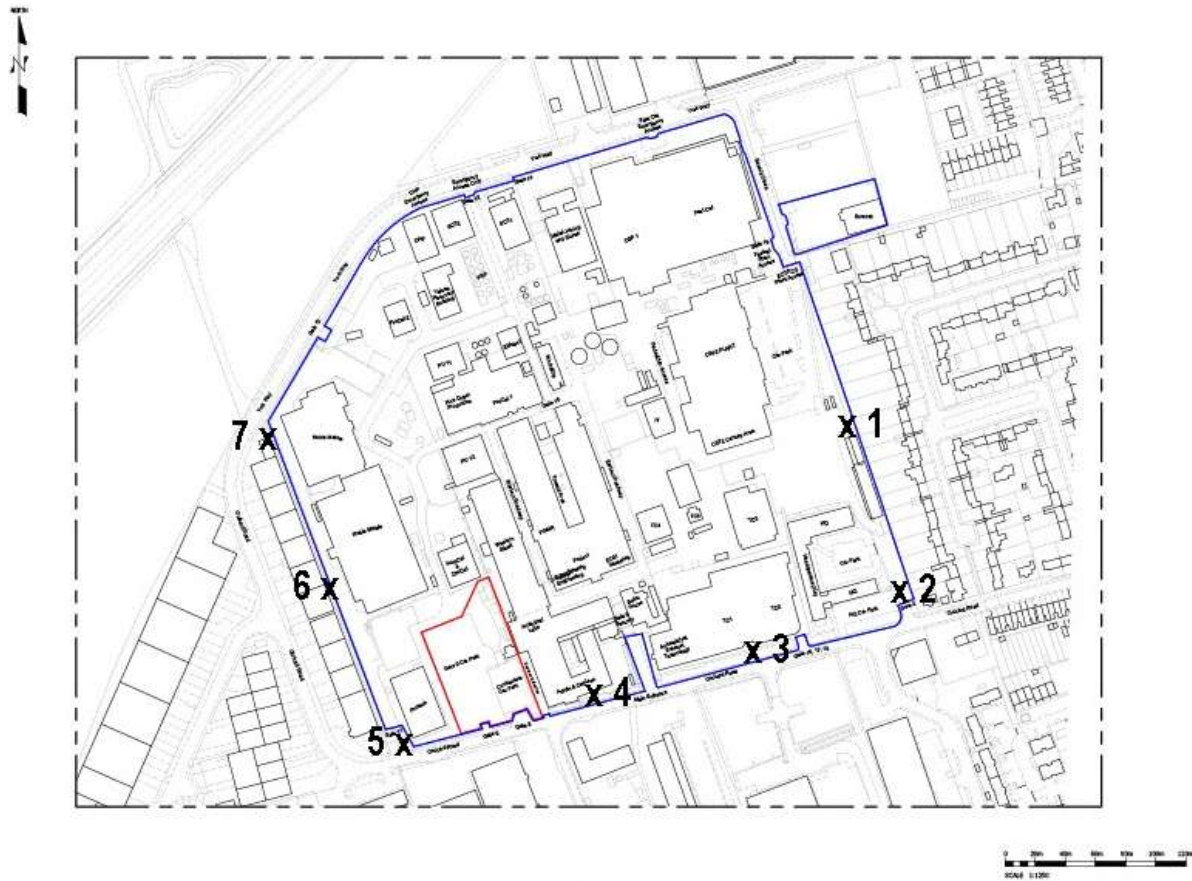


Figure 1: Site Location (and Receiver Positions)

It can be seen that the proposed development is in the industrial area, well away from the nearest residential housing to the east, and is therefore unlikely to cause any noise impact. However, the noise from the proposed development has been predicted at multiple positions around the site boundary, and compared with the existing measured background noise levels, in order to confirm that this is the case.

The proposed new 3CR annexe will be a 3-storey building with some external plant on the ground and on the roof. The main sources of noise will be the external plant, as shown in the figures and listed in the table below:

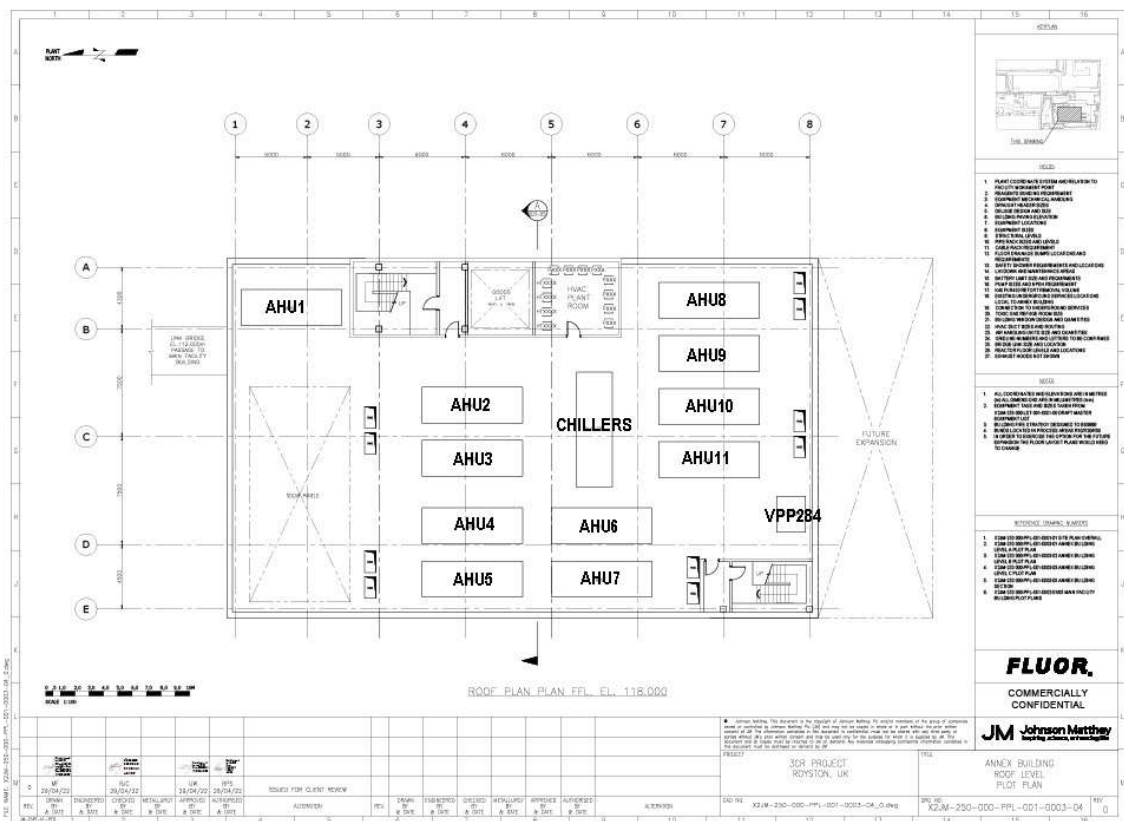
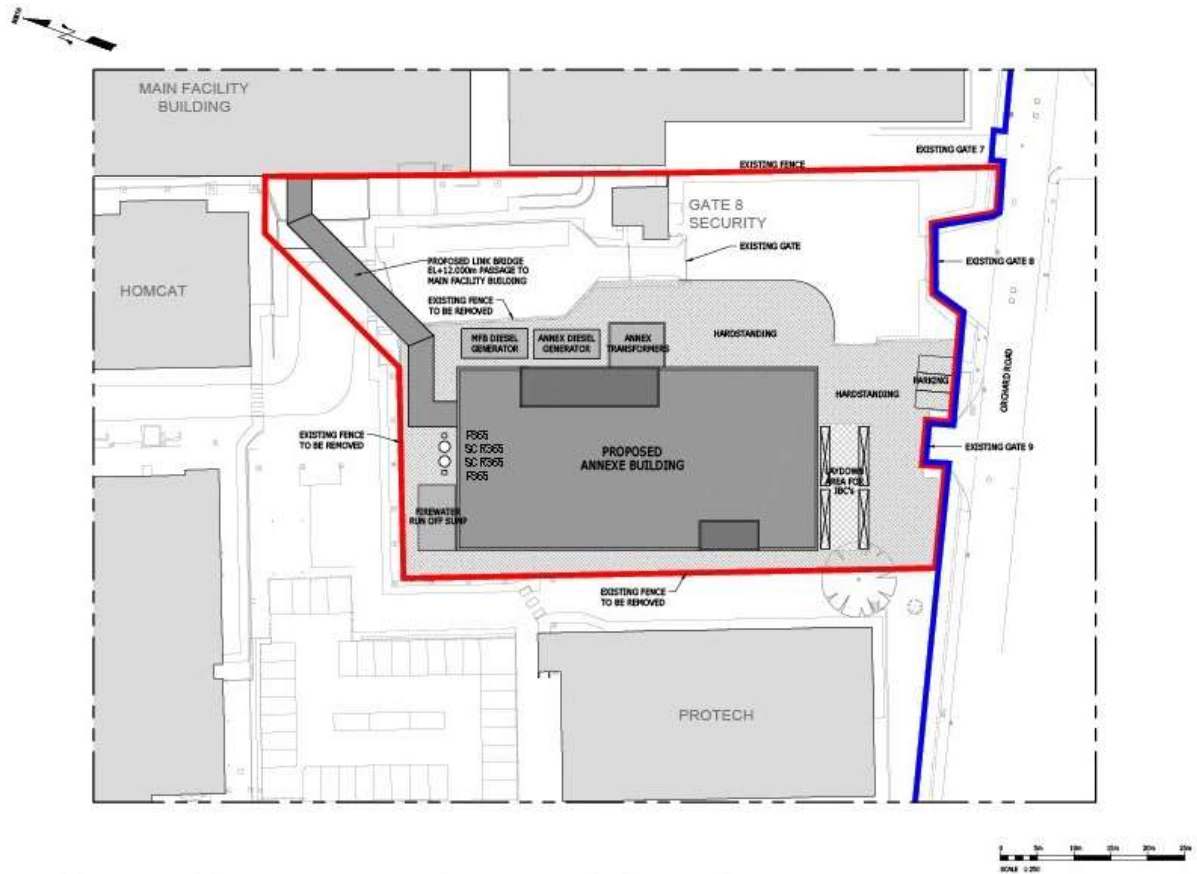


Figure 3: Roof Level Plan

Location	Source	Comment
Ground	MFB Generator (in Enclosure)	For emergency use only
	Annexe Generator (in Enclosure)	
	SCR365 Scrubber	
	SCR366 Scrubber	
	P365 Pump	
	P366 Pump	
Roof	AHU1 Air Handling Unit	11 AHUs included in proposal, but number may be reduced in final design
	AHU2 Air Handling Unit	
	AHU3 Air Handling Unit	
	AHU4 Air Handling Unit	
	AHU5 Air Handling Unit	
	AHU6 Air Handling Unit	
	AHU7 Air Handling Unit	
	AHU8 Air Handling Unit	
	AHU9 Air Handling Unit	
	AHU10 Air Handling Unit	
	AHU11 Air Handling Unit	
	Chillers	
	VPP284 Vacuum Pump	Not required

Table 1: Main Noise Sources

The final specification of the plant has not yet been determined, so source noise levels of other similar plant already installed on site have been used for the noise predictions. The new plant is likely to be quieter than the existing plant, so the noise predictions are likely to be worst-case.

3.0 Noise Predictions

The noise predictions are given in Appendix A.

3.1 Source Noise Levels

Source noise levels of other similar plant already installed on site have been used for the scrubbers, pumps, AHUs, and chillers. The new plant is likely to be quieter than the existing plant, so the noise predictions are likely to be worst-case.

There are no measurements of generators already installed on site, so typical source noise levels have been assumed for these items of plant, but it is understood they will be in enclosures, and will only be used in emergencies anyway.

The VPP284 vacuum pump on the roof is no longer required, and has therefore been omitted from the noise predictions.

3.2 Distance Attenuation

The distances between source and receiver have been scaled from the plans, and the distance attenuation has been calculated assuming point noise sources.

3.3 Screening Attenuation

Some of the plant will be shielded from the receiver positions by other existing buildings on site, and where this is the case a 10 dB screening attenuation has been assumed. All of the plant on the roof will be shielded from the receiver positions by a 1.2m high parapet, and where this is the case a 3 dB screening attenuation has been assumed. For any positions that are line of sight between source and receiver, no screening attenuation has been assumed. In practice, there is likely to be some additional screening attenuation, but this has not been included in the noise predictions in order to provide worst-case results.

3.4 Receiver Noise Levels

The calculated receiver noise levels are the sum of the individual noise levels for each item of plant, hence it is assumed that all of the plant is running at the same time, which will not necessarily be the case. The receiver positions are the same as used in the bi-annual noise surveys, so that the predicted noise levels can be compared with the measured background noise levels. It should be noted that only receiver positions 1 and 2 are adjacent to residential housing, all of the other receiver positions 3 to 7 are in the industrial area, and therefore less sensitive to noise.

4.0 Results

The results of the noise predictions are summarised in the following table:

Receiver Position	1	2	3	4	5	6	7
Noise Level from new building @ Receiver dB(A)	38.9	38.9	42.7	49.1	51.0	50.0	44.2
Existing Background Noise Level @ Receiver dB(A)	53	49	53	53	55	67	60
Difference dB(A)	-14.1	-10.1	-10.3	-3.9	-4.0	-17.0	-15.8
Predicted Background Noise Level with new building dB(A)	53.2	49.4	53.4	54.5	56.5	67.1	60.1
Increase in Background Noise Level with new building dB(A)	0.2	0.4	0.4	1.5	1.5	0.1	0.1

Table 2: Results of Noise Predictions

Bearing in mind that the noise predictions are worst-case, the results show that the noise from the new building will be at least 10 dB below the existing background noise level at the nearest residential housing (positions 1 and 2) and will therefore only increase the existing background noise level by less than 0.5 dB, which is barely noticeable.

The only positions where there could be a noticeable increase in noise level are positions 4 and 5, where the existing background noise level could increase by 1 or 2 dB, but this is in the industrial area, so is unlikely to be an issue.

It is recommended that the assumed source noise levels of all of the items of plant are included in the final specification of the new plant. If any items of plant do not meet the noise specification, then additional mitigation measures can be introduced before the plant is installed on site. The source noise levels will be checked during the full two-yearly environmental noise assessment of the site, and recommendations for mitigation will be provided if required.

APPENDIX A NOISE PREDICTIONS

Receiver Position 1 (Adjacent to Residential Housing)

Location	Source	Source Noise Level dB(A) @ 1m	Distance Source to Receiver (m)	Distance Attenuation (dB)	Screening Attenuation (dB)	Receiver Noise Level dB(A)
Ground	MFB Generator (in Enclosure)	70	280	48.9	10	11.1
	Annexe Generator (in Enclosure)	70	280	48.9	10	11.1
	SCR365 Scrubber	76	292	49.3	10	16.7
	SCR366 Scrubber	76	292	49.3	10	16.7
	P365 Pump	86	292	49.3	10	26.7
	P366 Pump	86	292	49.3	10	26.7
Roof	AHU1 Air Handling Unit	80	288	49.2	3	27.8
	AHU2 Air Handling Unit	80	292	49.3	3	27.7
	AHU3 Air Handling Unit	80	296	49.4	3	27.6
	AHU4 Air Handling Unit	80	300	49.5	3	27.5
	AHU5 Air Handling Unit	80	304	49.7	3	27.3
	AHU6 Air Handling Unit	80	304	49.7	3	27.3
	AHU7 Air Handling Unit	80	308	49.8	3	27.2
	AHU8 Air Handling Unit	80	296	49.4	3	27.6
	AHU9 Air Handling Unit	80	300	49.5	3	27.5
	AHU10 Air Handling Unit	80	304	49.7	3	27.3
	AHU11 Air Handling Unit	80	308	49.8	3	27.2
	Chillers	80	296	49.4	3	27.6
	VPP284 Vacuum Pump	0	312	49.9	3	0.0
Total Noise Level @ Receiver dB(A)						38.9
Existing Background Noise Level @ Receiver dB(A)						53
Difference dB(A)						-14.1
Predicted Background Noise Level with new building dB(A)						53.2
Increase in Noise Level with new building dB(A)						0.2

Receiver Position 2 (Adjacent to Residential Housing)

Location	Source	Source Noise Level dB(A) @ 1m	Distance Source to Receiver (m)	Distance Attenuation (dB)	Screening Attenuation (dB)	Receiver Noise Level dB(A)
Ground	MFB Generator (in Enclosure)	70	284	49.1	10	10.9
	Annexe Generator (in Enclosure)	70	284	49.1	10	10.9
	SCR365 Scrubber	76	300	49.5	10	16.5
	SCR366 Scrubber	76	300	49.5	10	16.5
	P365 Pump	86	300	49.5	10	26.5
	P366 Pump	86	300	49.5	10	26.5
Roof	AHU1 Air Handling Unit	80	288	49.2	3	27.8
	AHU2 Air Handling Unit	80	296	49.4	3	27.6
	AHU3 Air Handling Unit	80	300	49.5	3	27.5
	AHU4 Air Handling Unit	80	304	49.7	3	27.3
	AHU5 Air Handling Unit	80	308	49.8	3	27.2
	AHU6 Air Handling Unit	80	300	49.5	3	27.5
	AHU7 Air Handling Unit	80	304	49.7	3	27.3
	AHU8 Air Handling Unit	80	288	49.2	3	27.8
	AHU9 Air Handling Unit	80	292	49.3	3	27.7
	AHU10 Air Handling Unit	80	296	49.4	3	27.6
	AHU11 Air Handling Unit	80	300	49.5	3	27.5
	Chillers	80	292	49.3	3	27.7
	VPP284	0	304	49.7	3	0.0
Total Noise Level @ Receiver dB(A)						38.9
Existing Background Noise Level @ Receiver dB(A)						49
Difference dB(A)						-10.1
Predicted Background Noise Level with new building dB(A)						49.4
Increase in Noise Level with new building dB(A)						0.4

Receiver Position 3 (Industrial Area)

Location	Source	Source Noise Level dB(A) @ 1m	Distance Source to Receiver (m)	Distance Attenuation (dB)	Screening Attenuation (dB)	Receiver Noise Level dB(A)
Ground	MFB Generator (in Enclosure)	70	180	45.1	10	14.9
	Annexe Generator (in Enclosure)	70	180	45.1	10	14.9
	SCR365 Scrubber	76	200	46.0	10	20.0
	SCR366 Scrubber	76	200	46.0	10	20.0
	P365 Pump	86	200	46.0	10	30.0
	P366 Pump	86	200	46.0	10	30.0
Roof	AHU1 Air Handling Unit	80	188	45.5	3	31.5
	AHU2 Air Handling Unit	80	188	45.5	3	31.5
	AHU3 Air Handling Unit	80	192	45.7	3	31.3
	AHU4 Air Handling Unit	80	196	45.8	3	31.2
	AHU5 Air Handling Unit	80	200	46.0	3	31.0
	AHU6 Air Handling Unit	80	196	45.8	3	31.2
	AHU7 Air Handling Unit	80	200	46.0	3	31.0
	AHU8 Air Handling Unit	80	180	45.1	3	31.9
	AHU9 Air Handling Unit	80	184	45.3	3	31.7
	AHU10 Air Handling Unit	80	188	45.5	3	31.5
	AHU11 Air Handling Unit	80	192	45.7	3	31.3
	Chillers	80	188	45.5	3	31.5
	VPP284	0	196	45.8	3	0.0
Total Noise Level @ Receiver dB(A)						42.7
Existing Background Noise Level @ Receiver dB(A)						53
Difference dB(A)						-10.3
Predicted Background Noise Level with new building dB(A)						53.4
Increase in Noise Level with new building dB(A)						0.4

Receiver Position 4 (Industrial Area)

Location	Source	Source Noise Level dB(A) @ 1m	Distance Source to Receiver (m)	Distance Attenuation (dB)	Screening Attenuation (dB)	Receiver Noise Level dB(A)
Ground	MFB Generator (in Enclosure)	70	88	38.9	0	31.1
	Annexe Generator (in Enclosure)	70	84	38.5	0	31.5
	SCR365 Scrubber	76	108	40.7	10	25.3
	SCR366 Scrubber	76	108	40.7	10	25.3
	P365 Pump	86	108	40.7	10	35.3
	P366 Pump	86	108	40.7	10	35.3
Roof	AHU1 Air Handling Unit	80	96	39.6	3	37.4
	AHU2 Air Handling Unit	80	92	39.3	3	37.7
	AHU3 Air Handling Unit	80	96	39.6	3	37.4
	AHU4 Air Handling Unit	80	100	40.0	3	37.0
	AHU5 Air Handling Unit	80	104	40.3	3	36.7
	AHU6 Air Handling Unit	80	96	39.6	3	37.4
	AHU7 Air Handling Unit	80	100	40.0	3	37.0
	AHU8 Air Handling Unit	80	80	38.1	3	38.9
	AHU9 Air Handling Unit	80	84	38.5	3	38.5
	AHU10 Air Handling Unit	80	84	38.5	3	38.5
	AHU11 Air Handling Unit	80	88	38.9	3	38.1
	Chillers	80	88	38.9	3	38.1
	VPP284	0	92	39.3	3	0.0
Total Noise Level @ Receiver dB(A)						49.1
Existing Background Noise Level @ Receiver dB(A)						53
Difference dB(A)						-3.9
Predicted Background Noise Level with new building dB(A)						54.5
Increase in Noise Level with new building dB(A)						1.5

Receiver Position 5 (Industrial Area)

Location	Source	Source Noise Level dB(A) @ 1m	Distance Source to Receiver (m)	Distance Attenuation (dB)	Screening Attenuation (dB)	Receiver Noise Level dB(A)
Ground	MFB Generator (in Enclosure)	70	92	39.3	10	20.7
	Annexe Generator (in Enclosure)	70	84	38.5	10	21.5
	SCR365 Scrubber	76	84	38.5	10	27.5
	SCR366 Scrubber	76	84	38.5	10	27.5
	P365 Pump	86	84	38.5	10	37.5
	P366 Pump	86	84	38.5	10	37.5
Roof	AHU1 Air Handling Unit	80	84	38.5	3	38.5
	AHU2 Air Handling Unit	80	76	37.6	3	39.4
	AHU3 Air Handling Unit	80	72	37.1	3	39.9
	AHU4 Air Handling Unit	80	68	36.7	3	40.3
	AHU5 Air Handling Unit	80	64	36.1	3	40.9
	AHU6 Air Handling Unit	80	64	36.1	3	40.9
	AHU7 Air Handling Unit	80	60	35.6	3	41.4
	AHU8 Air Handling Unit	80	80	38.1	3	38.9
	AHU9 Air Handling Unit	80	84	38.5	3	38.5
	AHU10 Air Handling Unit	80	84	38.5	3	38.5
	AHU11 Air Handling Unit	80	88	38.9	3	38.1
	Chillers	80	68	36.7	3	40.3
	VPP284	0	92	39.3	3	0.0
Total Noise Level @ Receiver dB(A)						51.0
Existing Background Noise Level @ Receiver dB(A)						55
Difference dB(A)						-4.0
Predicted Background Noise Level with new building dB(A)						56.5
Increase in Noise Level with new building dB(A)						1.5

Receiver Position 6 (Industrial Area)

Location	Source	Source Noise Level dB(A) @ 1m	Distance Source to Receiver (m)	Distance Attenuation (dB)	Screening Attenuation (dB)	Receiver Noise Level dB(A)
Ground	MFB Generator (in Enclosure)	70	112	41.0	10	19.0
	Annexe Generator (in Enclosure)	70	116	41.3	10	18.7
	SCR365 Scrubber	76	88	38.9	10	27.1
	SCR366 Scrubber	76	88	38.9	10	27.1
	P365 Pump	86	88	38.9	10	37.1
	P366 Pump	86	88	38.9	10	37.1
Roof	AHU1 Air Handling Unit	80	104	40.3	3	36.7
	AHU2 Air Handling Unit	80	104	40.3	3	36.7
	AHU3 Air Handling Unit	80	104	40.3	3	36.7
	AHU4 Air Handling Unit	80	100	40.0	3	37.0
	AHU5 Air Handling Unit	80	100	40.0	3	37.0
	AHU6 Air Handling Unit	80	112	41.0	3	36.0
	AHU7 Air Handling Unit	80	108	40.7	3	36.3
	AHU8 Air Handling Unit	80	68	36.7	3	40.3
	AHU9 Air Handling Unit	80	64	36.1	3	40.9
	AHU10 Air Handling Unit	80	60	35.6	3	41.4
	AHU11 Air Handling Unit	80	56	35.0	3	42.0
	Chillers	80	116	41.3	3	35.7
	VPP284	0	52	34.3	3	0.0
Total Noise Level @ Receiver dB(A)						50.0
Existing Background Noise Level @ Receiver dB(A)						67
Difference dB(A)						-17.0
Predicted Background Noise Level with new building dB(A)						67.1
Increase in Noise Level with new building dB(A)						0.1

Receiver Position 7 (Industrial Area)

Location	Source	Source Noise Level dB(A) @ 1m	Distance Source to Receiver (m)	Distance Attenuation (dB)	Screening Attenuation (dB)	Receiver Noise Level dB(A)
Ground	MFB Generator (in Enclosure)	70	196	45.8	10	14.2
	Annexe Generator (in Enclosure)	70	204	46.2	10	13.8
	SCR365 Scrubber	76	180	45.1	10	20.9
	SCR366 Scrubber	76	180	45.1	10	20.9
	P365 Pump	86	180	45.1	10	30.9
	P366 Pump	86	180	45.1	10	30.9
Roof	AHU1 Air Handling Unit	80	192	45.7	3	31.3
	AHU2 Air Handling Unit	80	200	46.0	3	31.0
	AHU3 Air Handling Unit	80	200	46.0	3	31.0
	AHU4 Air Handling Unit	80	196	45.8	3	31.2
	AHU5 Air Handling Unit	80	196	45.8	3	31.2
	AHU6 Air Handling Unit	80	208	46.4	3	30.6
	AHU7 Air Handling Unit	80	204	46.2	3	30.8
	AHU8 Air Handling Unit	80	124	41.9	3	35.1
	AHU9 Air Handling Unit	80	124	41.9	3	35.1
	AHU10 Air Handling Unit	80	120	41.6	3	35.4
	AHU11 Air Handling Unit	80	120	41.6	3	35.4
	Chillers	80	212	46.5	3	30.5
	VPP284	0	120	41.6	3	0.0
Total Noise Level @ Receiver dB(A)						44.2
Existing Background Noise Level @ Receiver dB(A)						60
Difference dB(A)						-15.8
Predicted Background Noise Level with new building dB(A)						60.1
Increase in Noise Level with new building dB(A)						0.1