

REPORT TITLE:

Hornsey Town Hall, Crouch End, London N8 9JJ
Noise Impact Assessment, BREEAM Pol 05 and Planning conditions 23 and 22.

CLIENT DETAILS:

Ardmore Construction

DATE:

7th August 2019

REPORT REFERENCE:

PC-18-0337-RP1 Rev A

PREPARED BY:

Joan-Carles Blanco BSc._(Hons) MIOA

CHECKED/AUTHORISED BY:

Martin Jones BSc._(Hons) MIOA

Contents

1	SUMMARY	2
2	INTRODUCTION	3
3	CRITERIA	4
3.1	Acoustic criteria: BS4142:2014	6
3.2	Acoustic Criteria: BREEAM Pol 05 Assessment	8
3.3	Planning condition 22.	8
3.4	Planning condition 23.	9
4	CALCULATION ASSUMPTIONS	9
5	CALCULATION SUMMARY	12
6	BS4142:2014 ASSESSMENT	14
7	BREEAM POL 05 ASSESSMENT.	15
8	PLANNING CONDITION 22 AND 23.	16
9	CONCLUSIONS	16
10	ANNEXES.	17

Document Status and Revision Schedule

Issue/Revision	Description/Comments	Date	Prepared by	Approved by
-	Checked and Authorised	24/07/19	JCB	MJ
A	Minor changes	07/08/19	JCB	MJ

1 Summary

Pace Consult Limited was commissioned by Ardmore Construction to undertake a noise impact assessment from the proposed Plant units located externally within the Hornsey Town Hall, Crouch End, London N8 9JJ. The plant units are located within the existing and proposed building.

This report has been prepared in accordance with national acoustic guidelines and BS such as BS4142:2014 Methods for rating and assessing industrial and commercial units and BREEAM Pol 05 methodology and Planning conditions 22 and 23.

The plant units have not been selected yet, therefore this report includes a minimum sound emission from each plant in order to meet the relevant acoustic guideline and conditions 22 and 23.

The noise impact assessment based on the methodology contained within the BS4142:2014 has anticipated that the specific sound levels (noise from plant units) will have a low impact at the nearest noise sensitive receptors based on the recommended noise emission included within this report.

2 Introduction

Pace Consult Limited was commissioned by Ardmore construction to undertake a noise impact assessment from the proposed Plant units located externally within the existing and proposed buildings.

This report has been prepared in accordance with national acoustic guidelines and BS such as BS4142:2014 *Methods for rating and assessing industrial and commercial units*, BREEAM Pol 05 methodology and Planning conditions 23 and 22.

Sandy Brown completed a noise survey and documented the findings in the report 17119-R02-C dated 20th July 2017. Noise emission from the proposed plant units was assessed against the lowest measured background sound levels at 1 m from the external façade of the nearest noise sensitive receptors.

The proposal is to refurbish the existing Town Hall and the next building (Broadway Annex) into a hotel, residential units and new council spaces. There are also the proposal to build three new residential buildings (Block A, B, and the residential Mews).

This report shows the calculated plant noise levels at the nearest noise sensitive receptors to the proposed buildings, which were compared against the lowest measured background noise levels. This is a requirement of the BS4142:2017, BREEAM Pol 05 and planning conditions.

The levels used in the calculations are the limiting criteria in order to meet the sound levels recommended within the planning conditions To undertake the outdoor sound level calculations Part 2 of ISO 9613 Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation was used. This ISO standard is incorporated in the SoundPLAN v 8.1 software. This software was used to generate outdoor sound levels from the Plant units to the nearest noise sensitive receptors and to produce noise contour maps.

The sound pressure levels from the proposed plant were assessed during the night time with all plant items operating continuously.

3 Criteria

The external noise emission criteria at the nearest noise sensitive receptors, as taken from Sandy Brown report, are as follows:

Noise sensitive receptor	Representative monitoring location
19 Weston Park	Location 1
7 Hatherley Gardens	Location 2

5.2 Basic limits

Based on the above criteria and the measurement results, the cumulative noise level resulting from the operation of all new plant at 1 m from the worst affected windows of the nearest noise sensitive premises should not exceed the limits set out in Table 8.

Table 8 Plant noise limits at 1 m from the nearest noise sensitive premises

Time of day	Maximum sound pressure level at 1 m from noise sensitive premises ($L_{Aeq,15min}$ dB)	
	19 Weston Park	7 Hatherley Gardens
Weekday daytime (07:00- 23:00), Monday to Friday)	30	41
Weekend daytime (07:00- 23:00), Saturday and Sunday)	29	40
Weekday night time (23:00- 07:00), Sunday to Thursday)	23	28
Weekend night time (23:00- 07:00), Friday and Saturday)	24	33

Figure 1. Recommended limiting criteria from plant.

For the purposes of the noise impact assessment, the lowest measured background during weekday time has been considered (L_{A90} 23 and . 28 dB)

The figure overleaf includes the nearest noise sensitive receptors included within the noise impact analysis.



Figure 2. Nearest noise sensitive receptors.

The figure above shows the proposed and existing buildings and the nearest noise sensitive receptors identified with (NR), and the nearest noise sensitive receptors located within the proposed and existing buildings identified with (R).

The outdoor sound levels were calculated in accordance with ISO 9613-2 “Acoustics-Attenuation of sound during propagation outdoors”. Although there are different methodologies to calculate the outdoor noise propagation, ISO 9613- 2 is well regarded for the evaluation of outdoor noise propagation. The Standards are integrated in the SoundPLAN 8.1 software which was used to undertake the noise modelling.

3.1 Acoustic criteria: BS4142:2014

This standard sets out a methodology for the assessment of noise from factories, industrial premises or fixed installations and sources of an industrial/commercial nature.

The procedure contained in BS4142 for assessing the impact is to compare the measured or predicted noise level from the source in question, the 'specific noise level', at the assessment position with the correct background noise level for the worst-case time of operation.

Where the noise contains a 'distinguishable, discreet, continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks or clatters), or if the noise is irregular enough to attract attention' then a range of correction factors can be added to the specific noise level as appropriate to obtain the 'rating level'.

As this is a prescriptive report prior to plant installation, overall rating noise levels will be specified for the new installation. Compliance with the rating value will be necessary to provide evidence that significant adverse impact has been avoided as required by the NPSE.

To assess the impact, the measured background noise level is subtracted from the rating noise level. BS4142 states:

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessment and arriving at decisions, therefore, it is essential to place the sound in context.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (See Clause 8) from the rating level (see Clause 9) and consider the following.

- a) Typically, the greater the difference, the greater the magnitude of the impact.*
- b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- c) A difference of around 5dB is likely to be an indication of an adverse impact, depending on the context.*
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

- 1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

- 2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would*

occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as;

i) Façade sound insulation treatment

ii) Ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and Acoustic screening.

3.2 Acoustic Criteria: BREEAM Pol 05 Assessment

The available credit can be awarded when the noise levels from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development, are a difference no greater than +5dB during the day (07:00 hr to 23:00 hr) and +3dB at night (23:00 hr to 07:00 hr) compared to the background noise level.

Alternatively to the above, where there are, or will be, no noise-sensitive areas or buildings within 800m radius of the assessed site, the credit can be awarded by default.

3.3 Planning condition 22.

Noise from Plant and Associated Equipment

Noise arising from the use of any plant and associated equipment shall not exceed the existing background noise level (L_{A90} 15mins) when measures 1 metre external (L_{Aeq} 15mins) from the nearest residential or noise sensitive premises

3.4 Planning condition 23.

Noise Assessment

A Noise Assessment of the expected noise levels shall be submitted in writing to and for approval by the Local Planning Authority. The assessment shall be in accordance with BS4142:2014 'Methods for rating and assessing industrial and commercial sound'. The assessment shall propose mitigation measures to achieve the required noise level. The plant shall thereafter be installed and maintained in accordance with the approved details for the duration of its use.

4 Calculation assumptions

The noise data used for the calculations is recommended in order to meet the planning conditions and the relevant acoustic guidelines BS4142:2014 and BREEAM Pol 05. The table below includes the maximum sound power levels of each unit (sound power of the unit Lw dBA and the associated attenuator/silencer or acoustic louvre) in order to meet the recommended criteria.

Table 1. Recommended maximum noise levels (Sound power LW dBA)				
Town hall	Ground Floor			LW dBA
		Toilet Extract Fan	TEF 0001	35
		Toilet Supply Fan	FAN 0001	35
		Toilet Extract Fan	TEF 0002	35
		Toilet Supply Fan	FAN 0002	40
		Exhaust Air Louvre for Assembly Hall AHU and BAR heat Recovery unit		45
		Toilet Extract Fan	TEF 0003	50
		Toilet Supply Fan	FAN 0003	50
		Exhaust Louvre for disabled Toilet grille E1 - 16	EXL 0001	53
		HRU 01 Exhaust Louvre South grille E1, H - 20, 19		55
		HRU 01 Intake Louvre South grille E1, H - 20, 19		50
		HRU 02 Exhaust Louvre South grille E1, H - 20, 19		50
		HRU 02 Intake Louvre South grille E1,		50

		H - 20, 19		
	First Floor	Toilet Extract fan	TEF 01/01	40
		PANTRY EXTRACT FAN Exhaust		40
		Kitchen Extract fan Exhaust	FAN/01/04	35
		Kitchen Extract Fan Casing		35
		AHU Function Room Casing		35
		AHU Function Room Exhaust		35
		AHU Function Room Supply		35
		TEF/01/02 Toilet Extract Fan & HRU Exh		50
		HRU Intake		50
	Second Floor	Intake Louvre Plant 1 of 2 North East		30
		Intake Louvre Plant 2 of 2 South East		35
		AHU Supper Room Exhaust		40
		AHU Supper Room Intake		40
		AHU Cinema Exhaust		35
		AHU Cinema Intake		35
		Toilet Extract Exhaust		45
		HRU Intake louvre		30
		HRU EW CO-W Intake		45
		HRU EW CO-W Exhaust		45
		Toilet Extract Fan	TEF/02/01	40
		F&B Kitchen Exhaust		40
		F&B Kitchen Intake		40
	Roof	F&B Kitchen Exhaust		40
		Toilet Extract		45
		HRU WW CO-W Intake		50
		HRU WW CO-W Exhaust		50
		AHU Committee Room Casing		50
		AHU Committee Room Intake		50
		AHU Committee Room Exhaust		50
		AHU Gym Casing		45
		AHU Gym Intake		40
		AHU Gym Exhaust		40
		AHU Council Chamber Casing		40
		AHU Council Chamber Intake		40
		AHU Council Chamber Exhaust		40

		10 x Outdoor Units S.1 F&B Bar , council chamber ... grille H1, L1 - 13, 14		40
		4 x Outdoor units grille L1, N2 - 10, 12		40
		4 x VRF outdoor units grille L1, N2 - 10, 12		45
		2 x VRF Units grille L1,N2 - 10, 12		45
		AHU Hotel Casing		40
		AHU Hotel Intake		40
		AHU Hotel Exhaust		40
		Condensers 7x grille 17A,20 A - L1, N2		40
Broadway Annex	Roof	Pump Plant Room		50
		Air Source Heat Pump 6x units		47
Mews	Roof	Smoke Fans 2 x		53
		Plant room 3 x louvres		25
Block A	Roof	Flues Riser		68
		Residential Corridors Smoke Extract 4 x Units		55
		External Condensers Units 4 x Units		50
	Lower Ground	Energy Centre (1 of 5)		40
Block B	Roof	Smoke Extract 2 x units		65

Note. Units location included within the Annexes.

5 Calculation Summary

The table below shows the calculated sound levels, which are compared against the background recommended within the Sandy Brown report (Extracted from table 8) at the nearest noise sensitive receptors based on the recommended plant maximum sound emission.

Table 2. Calculated sound levels dBA			
		L _{A90} dB	Excess over background
NR1	18	23	-5
NR2	21	23	-2
NR3	19	23	-4
NR4	20	23	-3
NR5	19	23	-4
NR6	13	23	-10
NR7	11	28	-17
NR8	15	28	-13
NR9	16	28	-12
NR10	21	28	-7
NR11	23	28	-5
NR12	24	28	-4
NR13	25	28	-3
NR14	24	28	-4
R1	26	28	-2
R2	25	28	-3
R3	21	23	-2
R4	19	23	-4
R5	18	23	-5
R6	19	23	-4
R7	20	23	-3
R8	21	23	-2
R9	14	23	-9
R10	23	23	0
R11	22	23	-1
R12	20	23	-3
R13	23	23	0
R14	18	23	-5
R15	18	28	-10
R16	20	28	-8
R17	21	28	-7
R18	24	28	-4
R19	24	28	-4
R20	26	28	-2
R21	25	28	-3
R22	25	28	-3
R23	24	28	-4
R24	26	28	-2
R25	23	28	-5
R26	24	28	-4
R27	24	28	-4
R28	10	28	-18
R29	12	28	-16
R30	14	28	-14
R31	21	28	-7

The figure below shows the noise map of the study area.

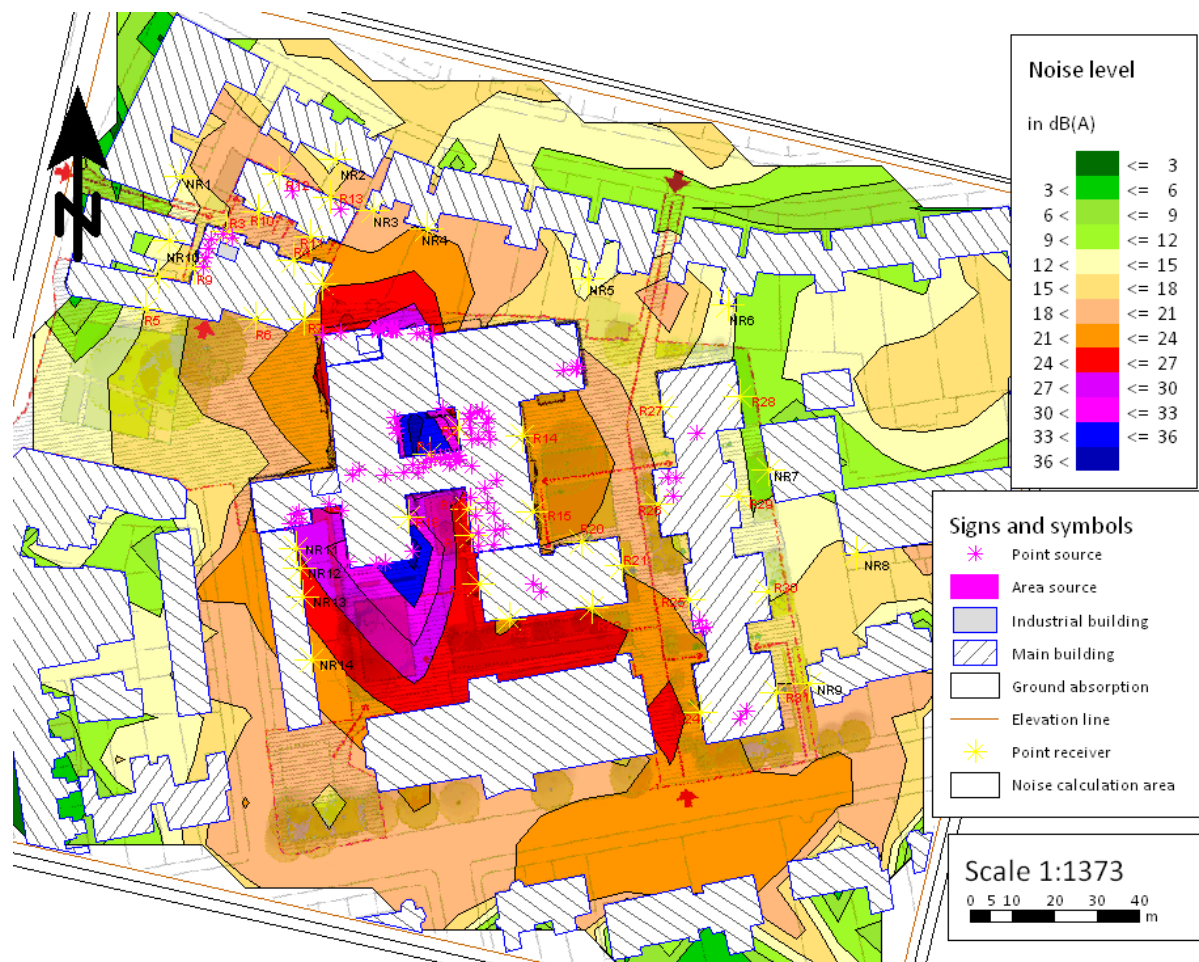


Figure 3. Noise map of the study area.

6 BS4142:2014 Assessment

The table below shows the assessment method recommended by BS4142:2014 *Method for rating and assessing industrial and commercial sound*. As the calculated noise emission are extremely low is considered that a tonality noise correction is not required.

Table 3. BS4142:2014 Assessment.				
		L _{A90} dB	correction as discussed in BS4142:2014	Excess over background
NR1	18	23	0	-5
NR2	21	23		-2
NR3	19	23		-4
NR4	20	23		-3
NR5	19	23		-4
NR6	13	23		-10
NR7	11	28		-17
NR8	15	28		-13
NR9	16	28		-12
NR10	21	28		-7
NR11	23	28		-5
NR12	24	28		-4
NR13	25	28		-3
NR14	24	28		-4
R1	26	28		-2
R2	25	28		-3
R3	21	23		-2
R4	19	23		-4
R5	18	23		-5
R6	19	23		-4
R7	20	23		-3
R8	21	23		-2
R9	14	23		-9
R10	23	23		0
R11	22	23		-1
R12	20	23		-3
R13	23	23		0
R14	18	23		-5
R15	18	28		-10
R16	20	28		-8
R17	21	28		-7
R18	24	28		-4
R19	24	28		-4
R20	26	28		-2
R21	25	28		-3
R22	25	28		-3
R23	24	28		-4
R24	26	28		-2
R25	23	28		-5
R26	24	28		-4
R27	24	28		-4
R28	10	28		-18
R29	12	28		-16
R30	14	28		-14
R31	21	28		-7

As can be seen from the assessment table the rating level is below the recommended acoustic rating. Therefore, this is an indication that the specific sound levels will have a low impact at the nearest noise sensitive receptors.

7 BREEAM Pol 05 Assessment.

The available credit can be awarded when the noise levels from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development, are a difference no greater than +5dB during the day (07:00 hr to 23:00 hr) and +3dB at night (23:00 hr to 07:00 hr) compared to the background noise level.

Table 4BREEAM Pol 05 Assessment			
	Calculated Sound levels dBA	L _{A90} dB	Excess over background
NR1	18	23	-5
NR2	21	23	-2
NR3	19	23	-4
NR4	20	23	-3
NR5	19	23	-4
NR6	13	23	-10
NR7	11	28	-17
NR8	15	28	-13
NR9	16	28	-12
NR10	21	28	-7
NR11	23	28	-5
NR12	24	28	-4
NR13	25	28	-3
NR14	24	28	-4
R1	26	28	-2
R2	25	28	-3
R3	21	23	-2
R4	19	23	-4
R5	18	23	-5
R6	19	23	-4
R7	20	23	-3
R8	21	23	-2
R9	14	23	-9
R10	23	23	0
R11	22	23	-1
R12	20	23	-3
R13	23	23	0
R14	18	23	-5
R15	18	28	-10
R16	20	28	-8
R17	21	28	-7
R18	24	28	-4
R19	24	28	-4
R20	26	28	-2
R21	25	28	-3
R22	25	28	-3
R23	24	28	-4
R24	26	28	-2
R25	23	28	-5
R26	24	28	-4
R27	24	28	-4
R28	10	28	-18
R29	12	28	-16
R30	14	28	-14
R31	21	28	-7

As the calculated levels are below the lowest measured background at the nearest noise sensitive receptor during day and night time, the available credit should be awarded.

8 Planning condition 22 and 23.

The noise impact assessment based on the methodology recommended by BS4142:2014 shows that the calculated noise levels are below the lowest measured background and therefore planning conditions 22 and 23 are expected to be met.

9 Conclusions

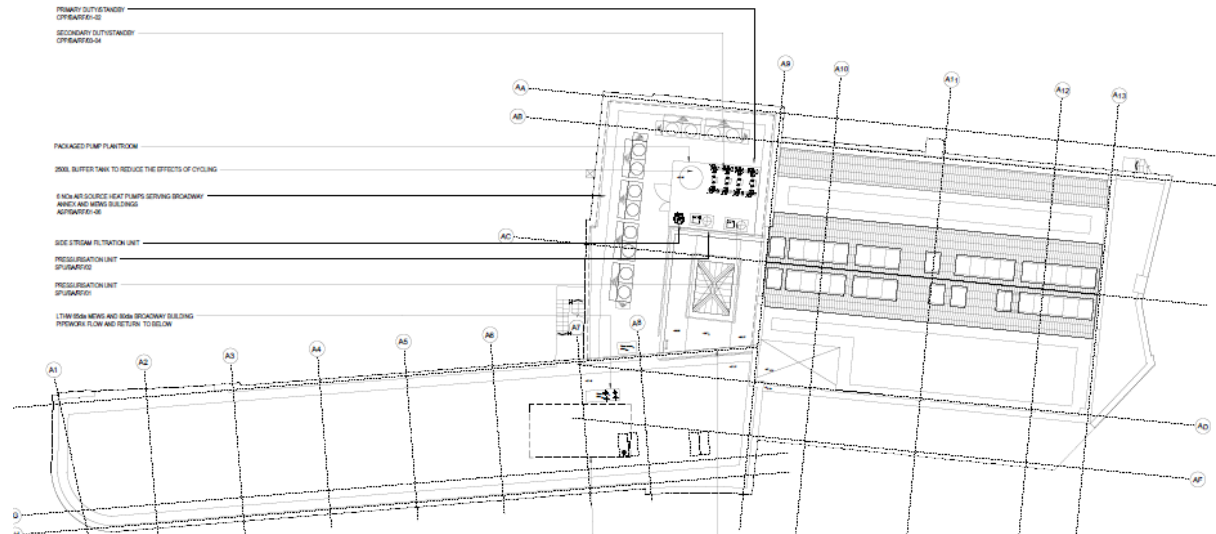
The BS4142:2014 environmental noise assessment based on the recommended maximum sound levels at each of the plant unit has anticipated that the specific sound levels will have a low impact at the nearest noise sensitive receptors.

The BREEAM POL05 assessment shows that the noise emission from the proposed plant units is expected to be below the measured background, and therefore the available credit should be awarded.

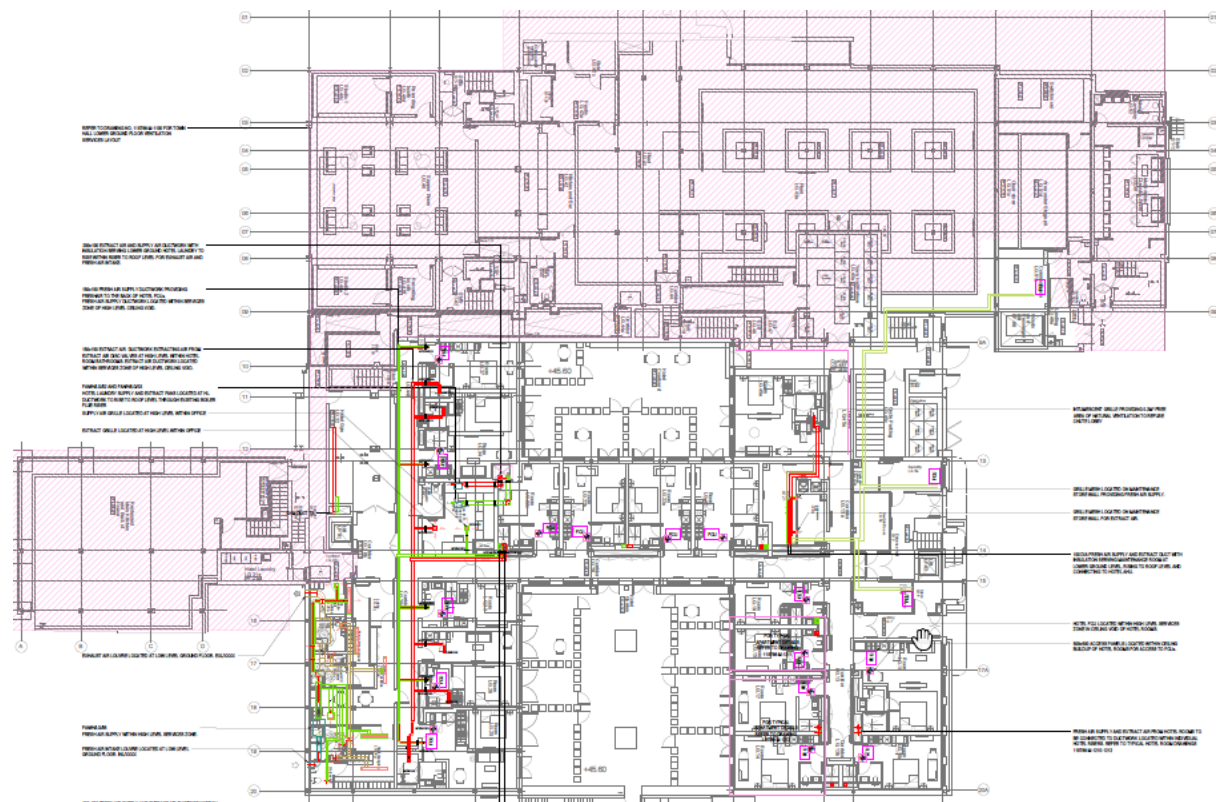
Based on the recommended noise criteria for each proposed plant unit, condition 22 and 23 is expected to be met.

10 Annexes.

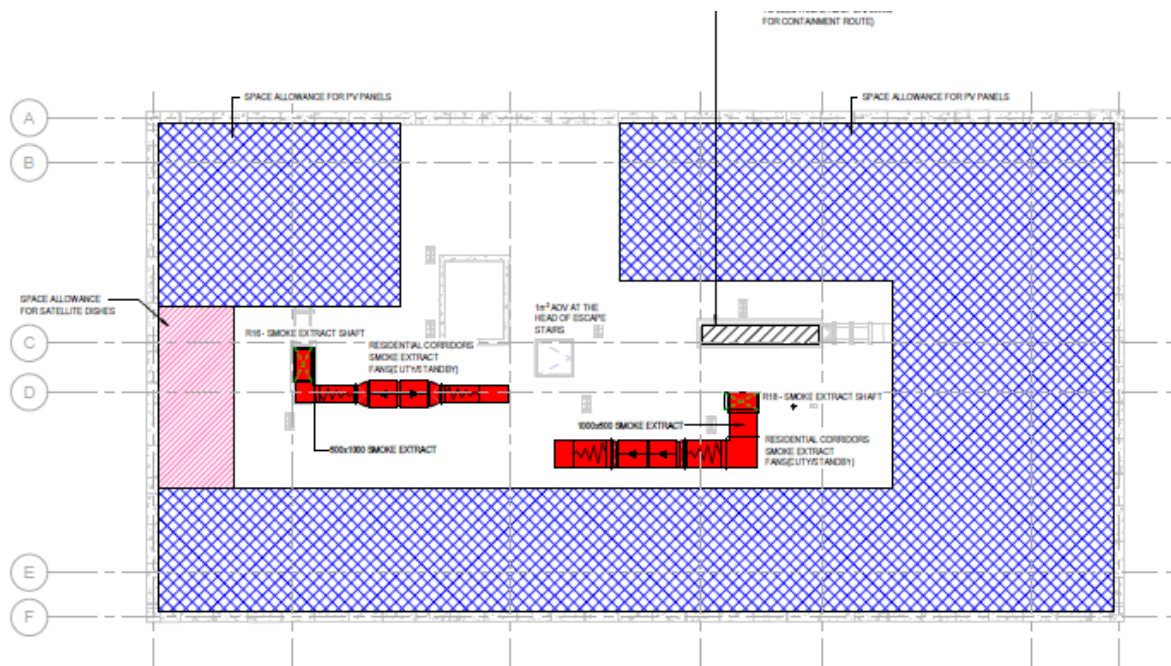
Broadway Annex.



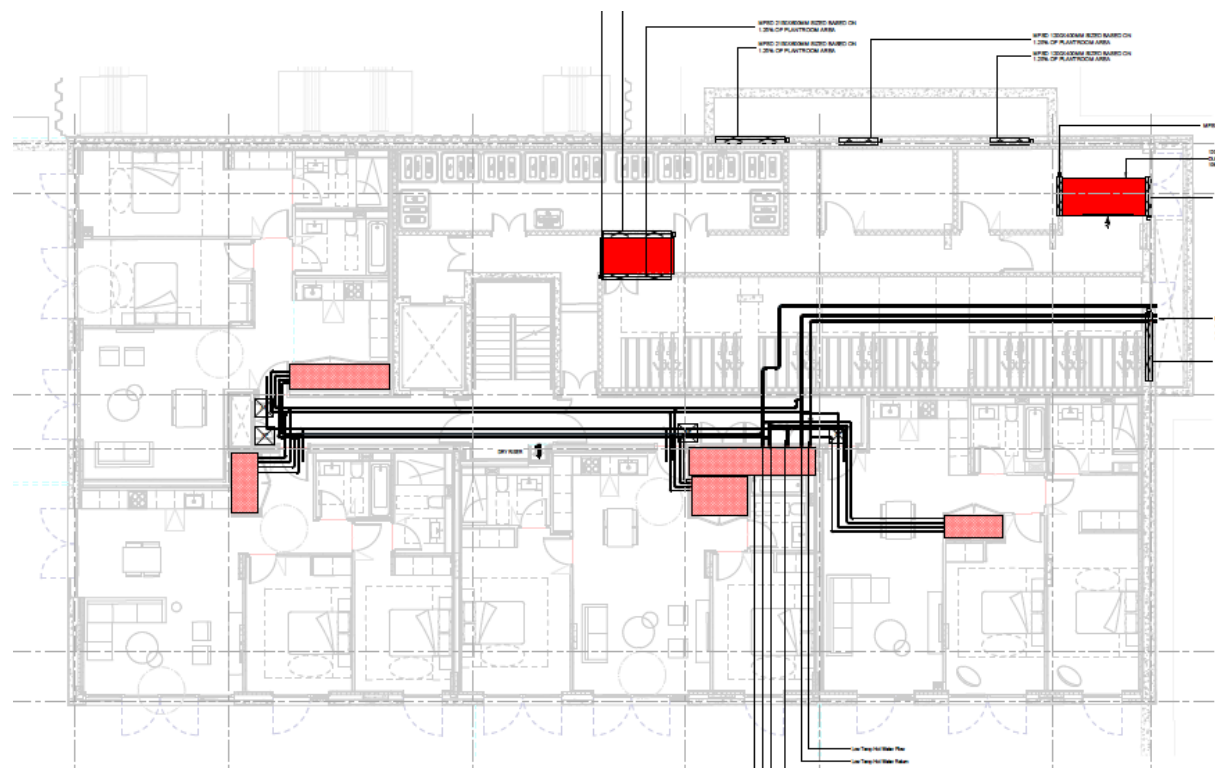
Town Hall.



PC-18-0326-RP1 Rev A



PC-18-0326-RP1 Rev A



REPORT TITLE:

Hornsey Town Hall, Crouch End, London N8 9JJ
Noise Impact Assessment, BREEAM Pol 05 and Planning conditions 23 and 22.

CLIENT DETAILS:

Ardmore Construction

DATE:

31st March 2023

REPORT REFERENCE:

PC-18-0337-RP1 Rev B

PREPARED BY:

Joan-Carles Blanco BSc.(Hons) MIOA

CHECKED/AUTHORISED BY:

Martin Jones BSc.(Hons) MIOA

Contents

1	SUMMARY	2
2	INTRODUCTION	3
3	CRITERIA	4
3.1	Acoustic criteria: BS4142:2014+A1:2019.	6
3.2	Acoustic Criteria: BREEAM Pol 05 Assessment	8
3.3	Planning condition 22.	8
3.4	Planning condition 23.	9
4	CALCULATION ASSUMPTIONS	9
5	CALCULATION SUMMARY	9
6	BS4142:2014 ASSESSMENT	11
7	BREEAM POL 05 ASSESSMENT.	12
8	PLANNING CONDITION 22 AND 23.	12
9	CONCLUSIONS	12
10	ANNEXES.	14

Document Status and Revision Schedule

Issue/Revision	Description/Comments	Date	Prepared by	Approved by
-	Checked and Authorised	24/07/19	JCB	MJ
A	Minor changes	07/08/19	JCB	MJ
B	Latest plant noise information	31/03/23	JCB	MJ

1 Summary

Pace Consult Limited was commissioned by Ardmore Construction to undertake a noise impact assessment from the proposed Plant units located externally within the Hornsey Town Hall, Crouch End, London N8 9JJ. The plant units are located within the existing and proposed building.

This report has been prepared in accordance with national acoustic guidelines and BS such as BS4142:2014+A1:2019 Methods for rating and assessing industrial and commercial units, BREEAM Pol 05 methodology, and Planning conditions 22 and 23.

The noise impact assessment based on the methodology contained within the BS4142:2014+A1:2019 has anticipated that the specific sound levels (noise from plant units) will have a low impact at the nearest noise sensitive receptors.

The noise assessment shows evidence that the noise emission from the proposed plant units are not exceeding the pre-existing background at the nearest residential dwellings, and therefore full compliance with planning conditions are expected.

Regarding BREEAM Pol 05 assessment, as the noise emission from the proposed plant units are not exceeding the preexisting background, the targeted BREEAM credit can be awarded.

2 Introduction

Pace Consult Limited was commissioned by Ardmore construction to undertake a noise impact assessment from the proposed Plant units located externally within the existing and proposed buildings.

This report has been prepared in accordance with national acoustic guidelines and BS such as BS4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial units*, BREEAM Pol 05 methodology and Planning conditions 23 and 22.

Sandy Brown completed a noise survey and documented the findings in the report 17119-R02-C dated 20th July 2017. Noise emission from the proposed plant units was assessed against the lowest measured background sound levels at 1 m from the external façade of the nearest noise sensitive receptors.

The proposal is to refurbish the existing Town Hall and the next building (Broadway Annex) into a hotel, residential units and new council spaces. There are also the proposal to build three new residential buildings (Block A, B, and the residential Mews).

This report shows the calculated plant noise levels at the nearest noise sensitive receptors to the proposed buildings, which were compared against the lowest measured background noise levels. This is a requirement of the BS4142:2014+A1:2019, BREEAM Pol 05 and planning conditions.

The levels used in the calculations are the limiting criteria in order to meet the sound levels recommended within the planning conditions To undertake the outdoor sound level calculations Part 2 of ISO 9613 Acoustics -- Attenuation of sound during propagation outdoors -- Part 2: General method of calculation was used. This ISO standard is incorporated in the SoundPLAN v 8.2 software. This software was used to generate outdoor sound levels from the Plant units to the nearest noise sensitive receptors and to produce noise contour maps.

The sound pressure levels from the proposed plant were assessed during the night time with all plant items operating continuously.

3 Criteria

The external noise emission criteria at the nearest noise sensitive receptors, as taken from Sandy Brown report, are as follows:

Noise sensitive receptor	Representative monitoring location
19 Weston Park	Location 1
7 Hatherley Gardens	Location 2

5.2 Basic limits

Based on the above criteria and the measurement results, the cumulative noise level resulting from the operation of all new plant at 1 m from the worst affected windows of the nearest noise sensitive premises should not exceed the limits set out in Table 8.

Table 8 Plant noise limits at 1 m from the nearest noise sensitive premises

Time of day	Maximum sound pressure level at 1 m from noise sensitive premises ($L_{Aeq,15min}$ dB)	
	19 Weston Park	7 Hatherley Gardens
Weekday daytime (07:00- 23:00), Monday to Friday)	30	41
Weekend daytime (07:00- 23:00), Saturday and Sunday)	29	40
Weekday night time (23:00- 07:00), Sunday to Thursday)	23	28
Weekend night time (23:00- 07:00), Friday and Saturday)	24	33

Figure 1. Recommended limiting criteria from plant.

For the purposes of the noise impact assessment, the lowest measured background during weekday time has been considered (L_{A90} 23 and 28 dB respectively)

The figure overleaf includes the nearest noise sensitive receptors included within the noise impact analysis.

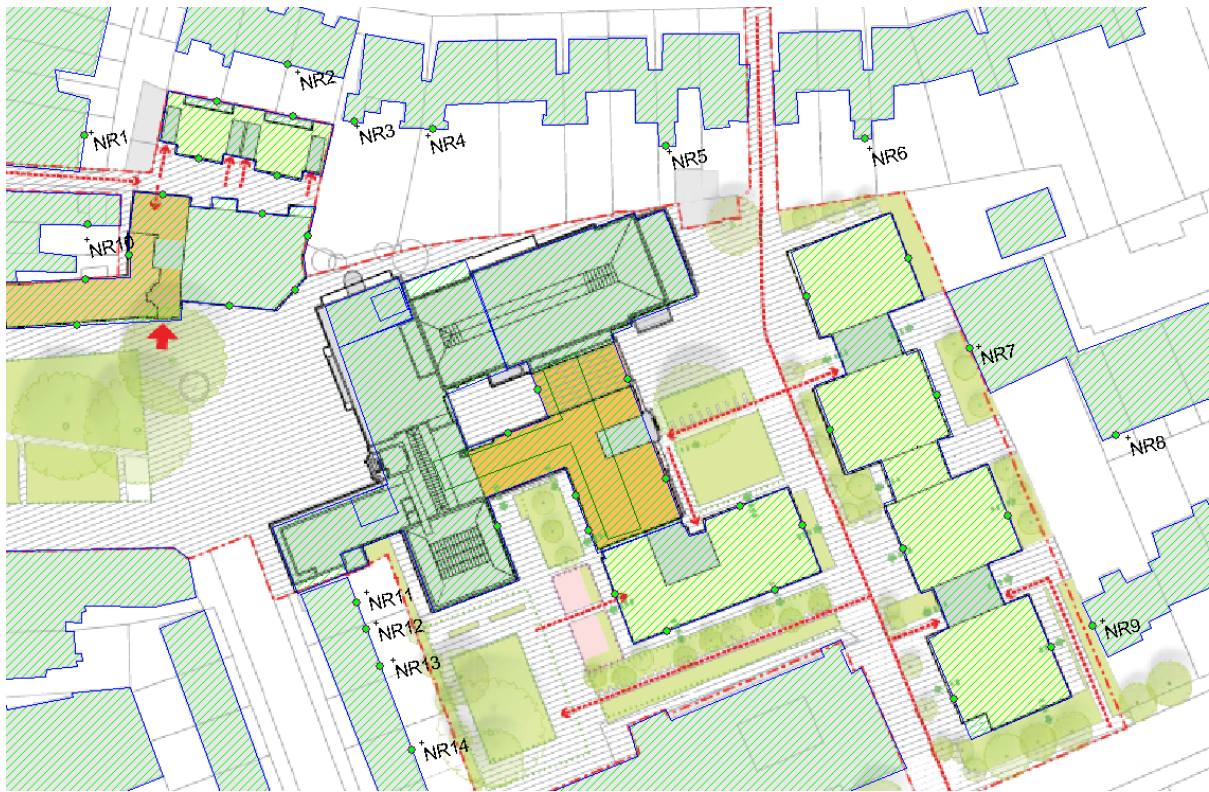


Figure 2. Nearest noise sensitive receptors.

The figure above shows the proposed and existing buildings and the nearest noise sensitive receptors identified with (NR). The nearest residential dwellings which have the potential to be affected by the noise emission from the proposed plant are located on Haringey Park, Weston park, and Hatherley Gardens.

The outdoor sound levels were calculated in accordance with ISO 9613-2 “Acoustics- Attenuation of sound during propagation outdoors”. Although there are different methodologies to calculate the outdoor noise propagation, ISO 9613- 2 is well regarded for the evaluation of outdoor noise propagation. The Standards are integrated in the SoundPLAN 8.1 software which was used to undertake the noise modelling.

3.1 Acoustic criteria: BS4142:2014+A1:2019.

This standard sets out a methodology for the assessment of noise from factories, industrial premises or fixed installations and sources of an industrial/commercial nature.

The procedure contained in BS4142 for assessing the impact is to compare the measured or predicted noise level from the source in question, the 'specific noise level', at the assessment position with the correct background noise level for the worst-case time of operation.

Where the noise contains a 'distinguishable, discreet, continuous note (whine, hiss, screech, hum etc.) or if there are distinct impulses in the noise (bangs, clicks or clatters), or if the noise is irregular enough to attract attention' then a range of correction factors can be added to the specific noise level as appropriate to obtain the 'rating level'.

As this is a prescriptive report prior to plant installation, overall rating noise levels will be specified for the new installation. Compliance with the rating value will be necessary to provide evidence that significant adverse impact has been avoided as required by the NPSE.

To assess the impact, the measured background noise level is subtracted from the rating noise level. BS4142 states:

The significance of sound of an industrial and/or commercial nature depends upon both the margin by which the rating level of the specific sound source exceeds the background sound level and the context in which the sound occurs. An effective assessment cannot be conducted without an understanding of the reason(s) for the assessment and the context in which the sound occurs/will occur. When making assessment and arriving at decisions, therefore, it is essential to place the sound in context.

Obtain an initial estimate of the impact of the specific sound by subtracting the measured background sound level (See Clause 8) from the rating level (see Clause 9) and consider the following.

- a) Typically, the greater the difference, the greater the magnitude of the impact.*
- b) A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
- c) A difference of around 5dB is likely to be an indication of an adverse impact, depending on the context.*
- d) The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.*

Where the initial estimate of the impact needs to be modified due to the context, take all pertinent factors into consideration, including the following.

- 1) The absolute level of sound. For a given difference between the rating level and the background sound level, the magnitude of the overall impact might be greater for an acoustic environment where the residual sound level is high than for an acoustic environment where the residual sound level is low.*

Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.

Where residual sound levels are very high, the residual sound might itself result in adverse impacts or significant adverse impacts, and the margin by which the rating level exceeds the background might simply be an indication of the extent to which the specific sound source is likely to make those impacts worse.

- 2) The character and level of the residual sound compared to the character and level of the specific sound. Consider whether it would be beneficial to compare the frequency spectrum and temporal variation of the specific sound with that of the ambient or residual sound, to assess the degree to which the specific sound source is likely to be distinguishable and will represent an incongruous sound by comparison to the acoustic environment that would*

occur in the absence of the specific sound. Any sound parameters, sampling periods and averaging time periods used to undertake character comparisons should reflect the way in which sound of an industrial and/or commercial nature is likely to be perceived and how people react to it.

3) The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions, such as;

i) Façade sound insulation treatment

ii) Ventilation and/or cooling that will reduce the need to have windows open so as to provide rapid or purge ventilation; and Acoustic screening.

3.2 Acoustic Criteria: BREEAM Pol 05 Assessment

The available credit can be awarded when the noise levels from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development, are a difference no greater than +5dB during the day (07:00 hr to 23:00 hr) and +3dB at night (23:00 hr to 07:00 hr) compared to the background noise level.

Alternatively to the above, where there are, or will be, no noise-sensitive areas or buildings within 800m radius of the assessed site, the credit can be awarded by default.

3.3 Planning condition 22.

Noise from Plant and Associated Equipment

Noise arising from the use of any plant and associated equipment shall not exceed the existing background noise level (L_{A90} 15mins) when measures 1 metre external (L_{Aeq} 15mins) from the nearest residential or noise sensitive premises

3.4 Planning condition 23.

Noise Assessment

A Noise Assessment of the expected noise levels shall be submitted in writing to and for approval by the Local Planning Authority. The assessment shall be in accordance with BS4142:2014 'Methods for rating and assessing industrial and commercial sound'. The assessment shall propose mitigation measures to achieve the required noise level. The plant shall thereafter be installed and maintained in accordance with the approved details for the duration of its use.

4 Calculation assumptions

The noise data used for the calculations have been submitted to Pace Consult Ltd by the M&E subcontractor (White Code). The noise levels of the proposed plant units and location, Insertion Losses dB provided by the attenuators, sound reduction provided by the acoustic louvres, acoustic enclosures and acoustic barrier are included in the Annex.

5 Calculation Summary

The table below shows the calculated sound levels at the nearest noise sensitive receptors.

Table 1. Calculated sound levels dBA	
Receptor	Calculated sound levels at 1 m from the external façade (highest)
NR1	15
NR2	20
NR3	21
NR4	22
NR5	23
NR6	22
NR7	18
NR8	17
NR9	28
NR10	23
NR11	22
NR12	22
NR13	27
NR14	28

The figure below shows the noise map of the study area.



Figure 3. Noise map of the study area.

6 BS4142:2014 Assessment

The table below shows the assessment method recommended by BS4142:2014 *Method for rating and assessing industrial and commercial sound*. As the calculated noise emission are extremely low is considered that a tonality noise correction is not required.

Table 2. BS4142:2014 Assessment.				
		L _{A90} dB	correction as discussed in BS4142:2014	Excess over background
NR1	15	23	0	-8
NR2	20	23		-3
NR3	21	23		-2
NR4	22	23		-1
NR5	23	23		0
NR6	22	23		-1
NR7	18	28		-10
NR8	17	28		-11
NR9	28	28		0
NR10	23	28		-5
NR11	22	28		-6
NR12	22	28		-6
NR13	27	28		-1
NR14	28	28		0

As can be seen from the assessment table the rating level is below the recommended acoustic rating. Therefore, this is an indication that the specific sound levels will have a low impact at the nearest noise sensitive receptors.

7 BREEAM Pol 05 Assessment.

The available credit can be awarded when the noise levels from the proposed site/building, as measured in the locality of the nearest or most exposed noise-sensitive development, are a difference no greater than +5dB during the day (07:00 hr to 23:00 hr) and +3dB at night (23:00 hr to 07:00 hr) compared to the background noise level.

Table 3. BS4142:2014 Assessment.			
		L _{A90} dB	Excess over background
NR1	15	23	-8
NR2	20	23	-3
NR3	21	23	-2
NR4	22	23	-1
NR5	23	23	0
NR6	22	23	-1
NR7	18	28	-10
NR8	17	28	-11
NR9	28	28	0
NR10	23	28	-5
NR11	22	28	-6
NR12	22	28	-6
NR13	27	28	-1
NR14	28	28	0

As the calculated levels are below the lowest measured background at the nearest noise sensitive receptors during day and night time, the available credit should be awarded.

8 Planning condition 22 and 23.

The noise impact assessment based on the methodology recommended by BS4142:2014 shows that the calculated noise levels are below the lowest measured background and therefore planning conditions 22 and 23 are expected to be met.

9 Conclusions

The BS4142:2014+A1:2019 environmental noise assessment based on the recommended maximum sound levels at each of the plant unit has anticipated that the specific sound levels will have a low impact at the nearest noise sensitive receptors.

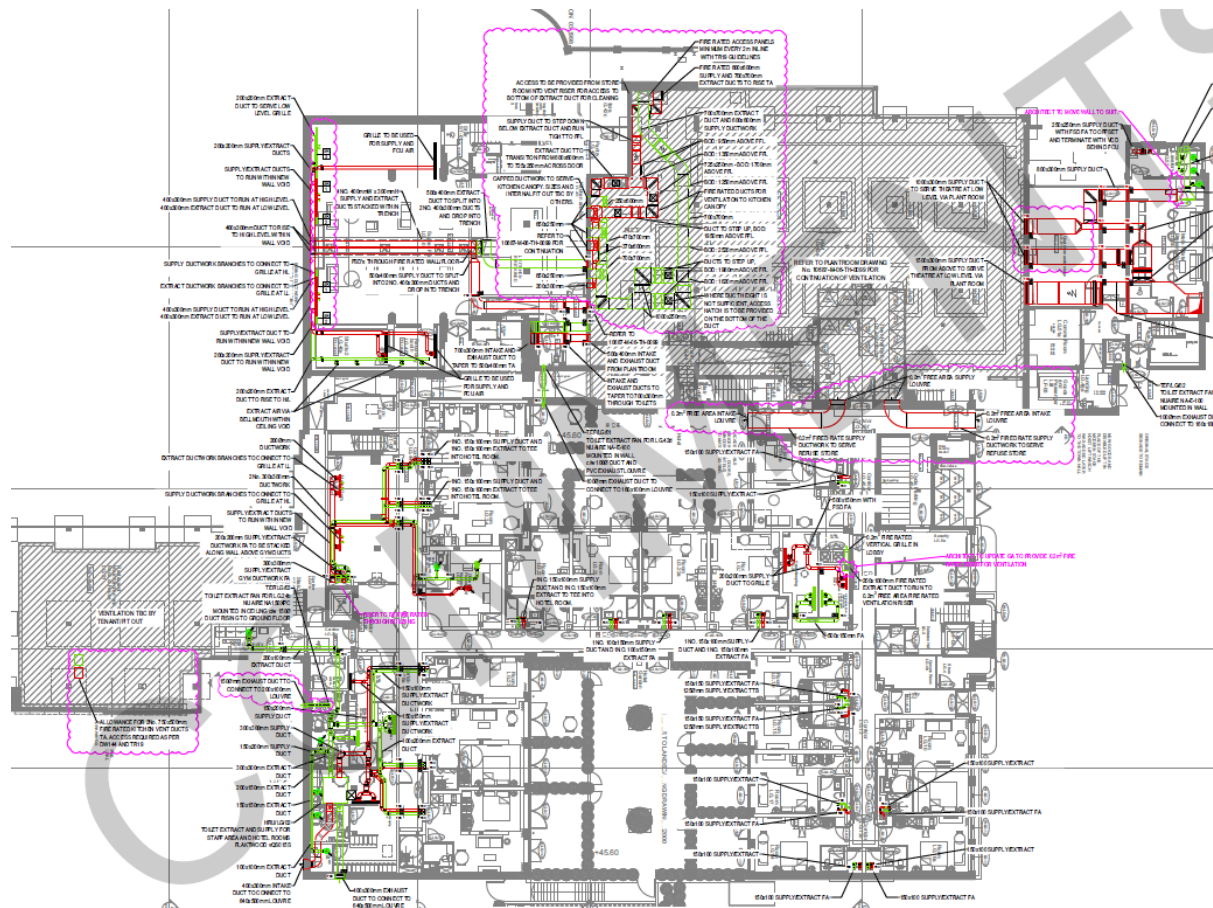
The BREEAM POL05 assessment shows that the noise emission from the proposed plant units is expected to be below the measured background during day and night time, and therefore the available credit should be awarded.

The noise assessment shows evidence that the noise emission from the proposed plant units are not exceeding the pre-existing background at the nearest residential dwellings, and therefore full compliance with planning conditions are expected.

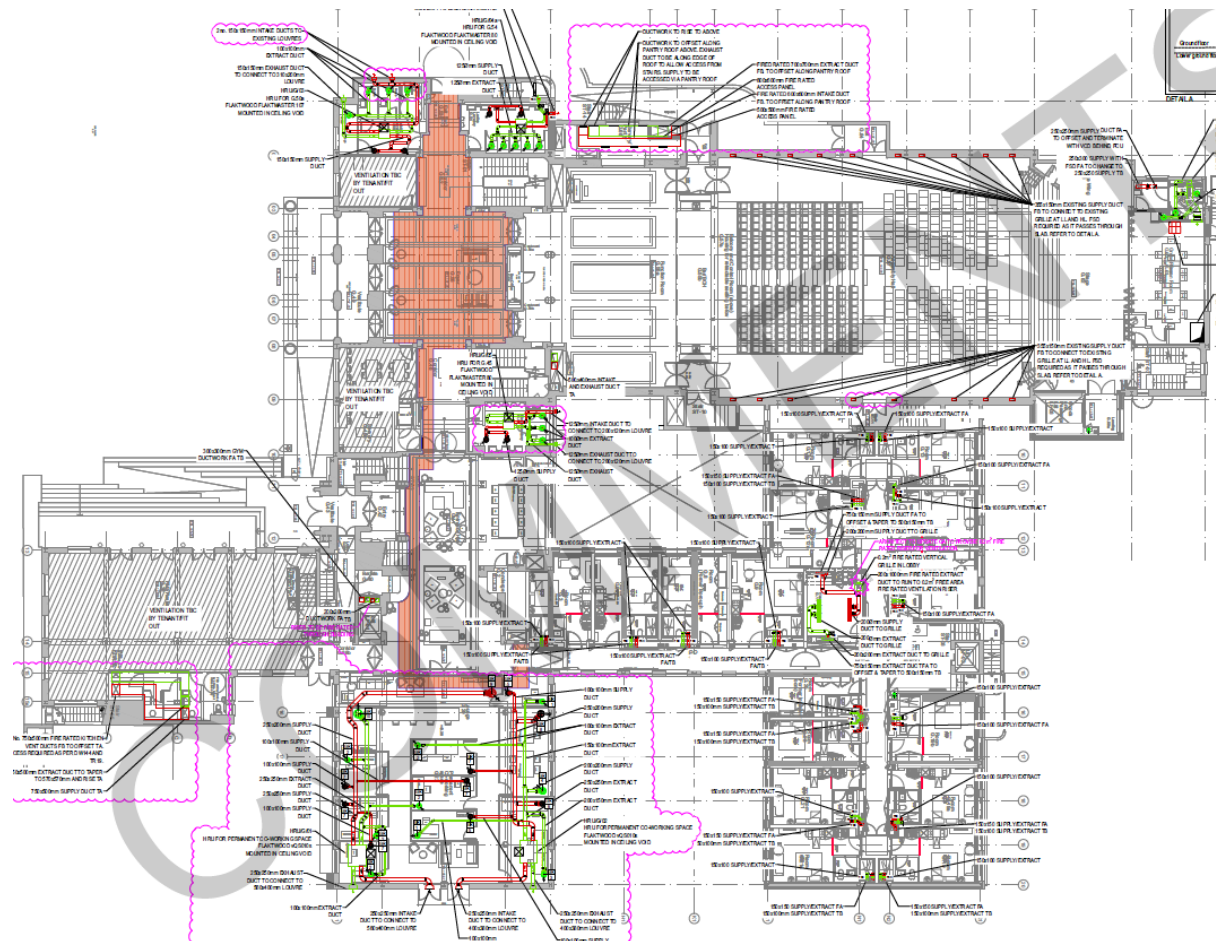
10 Annexes.

Town Hall.

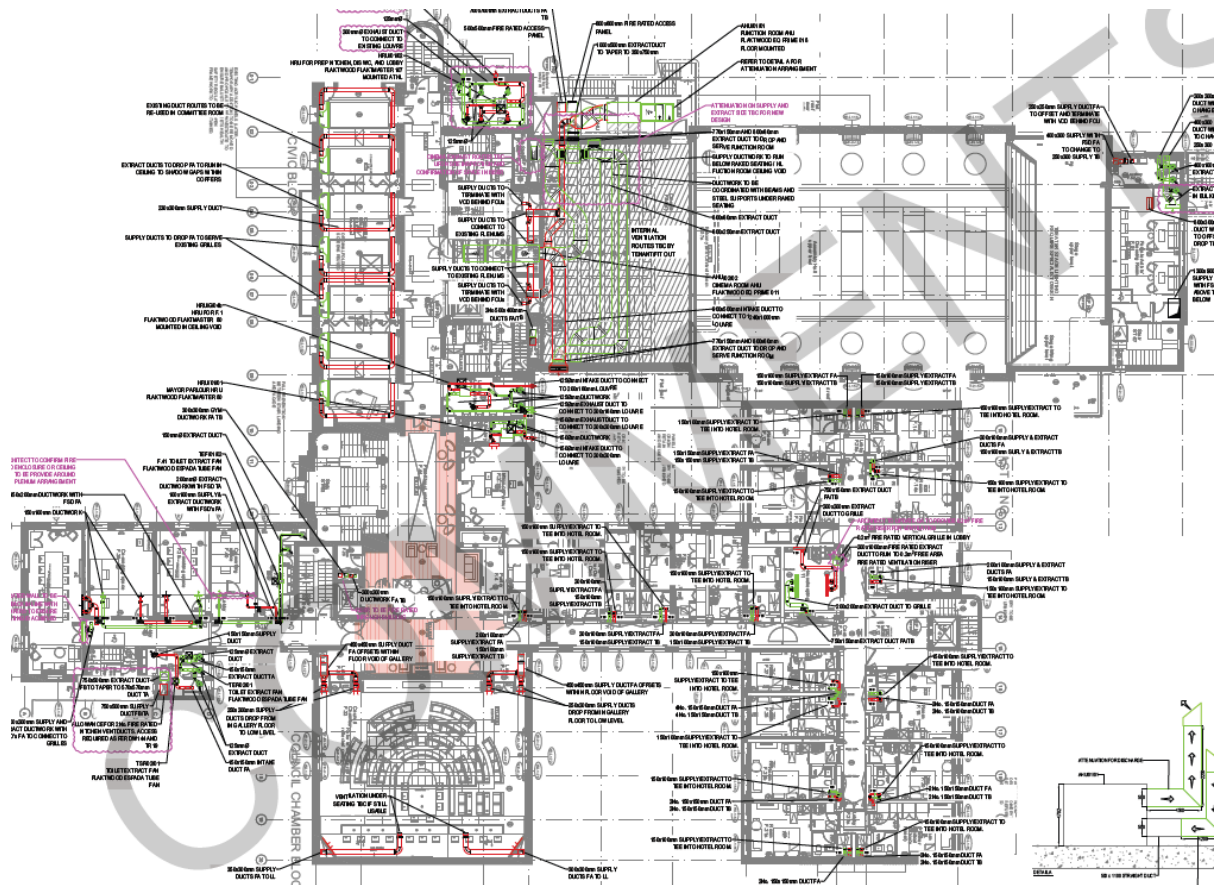
Lower Ground Floor.



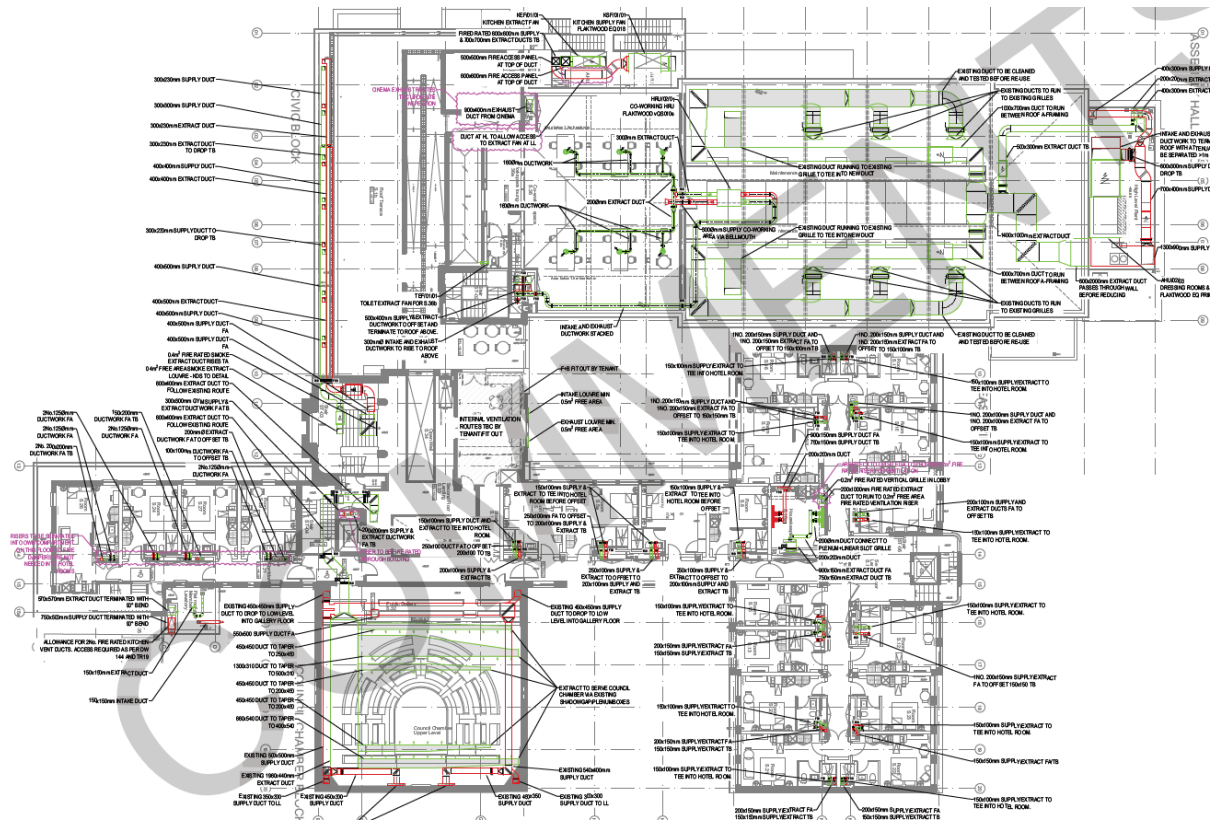
PC-18-0326-RP1 Rev B



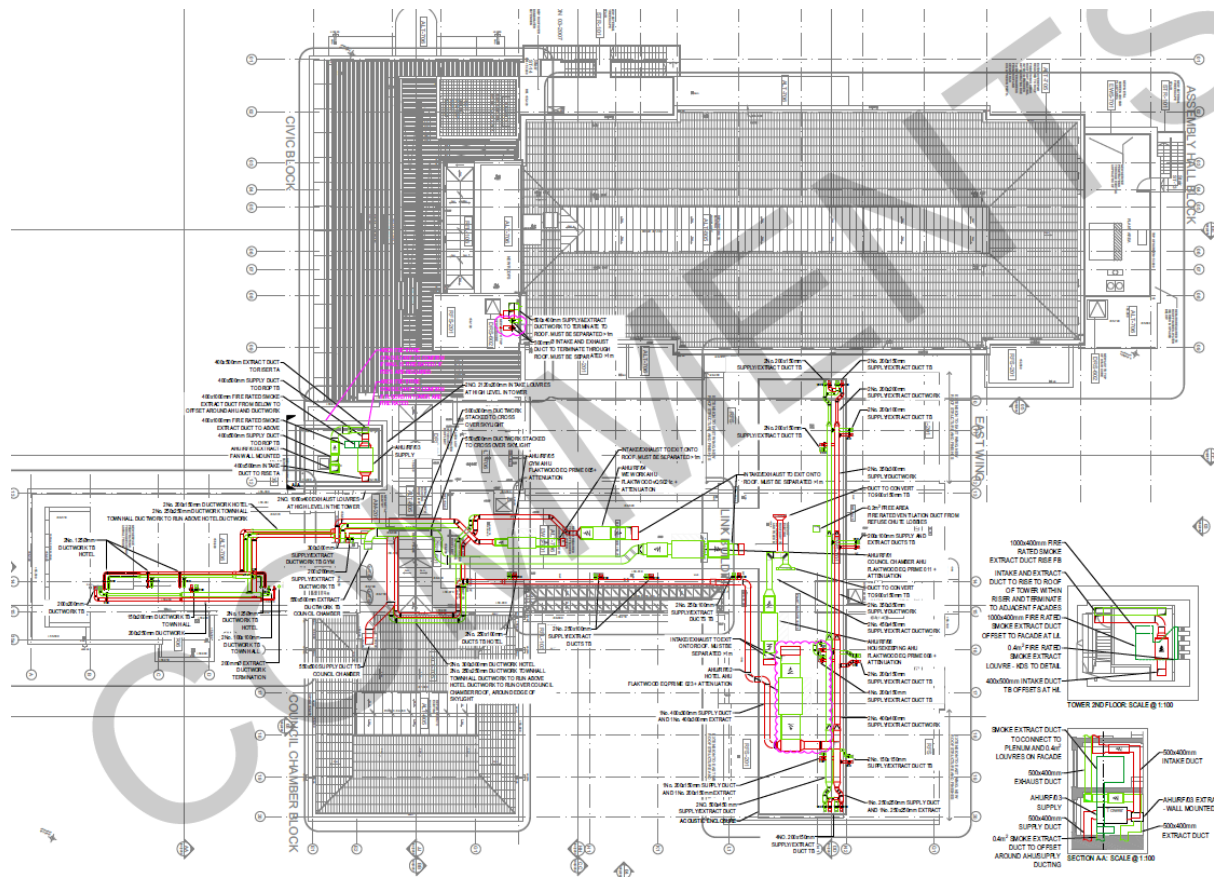
First Floor



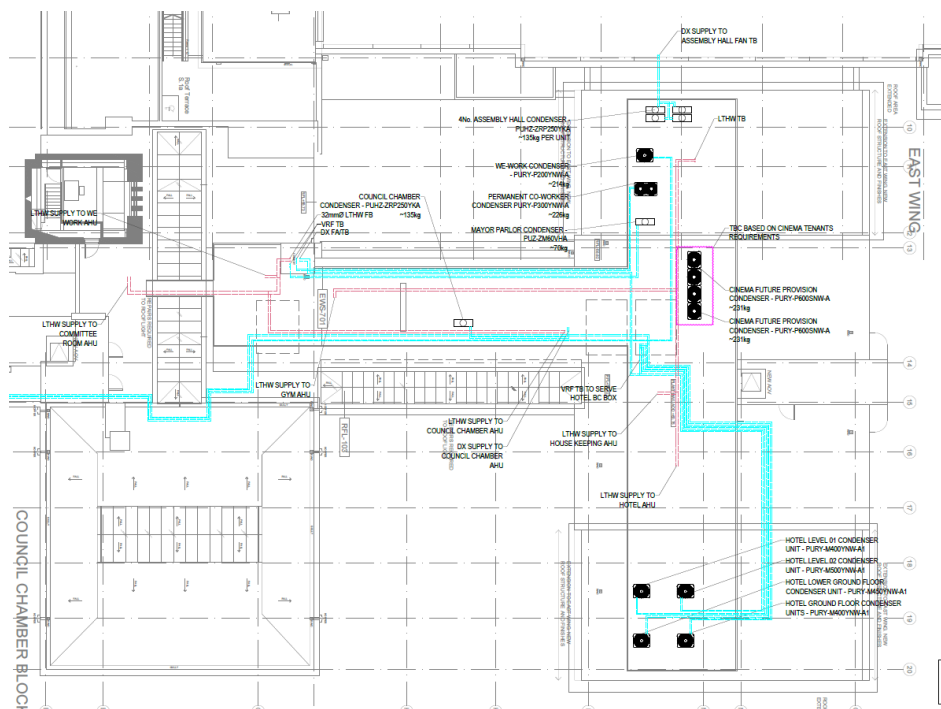
Second Floor



Roof

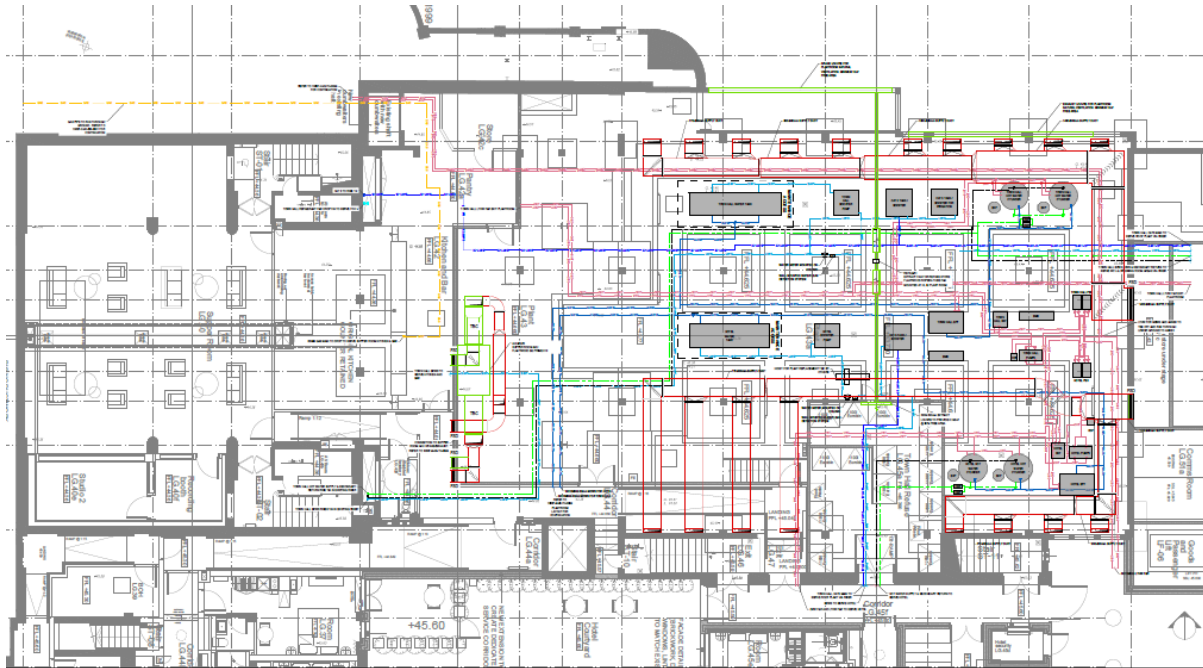


Roof Condensers

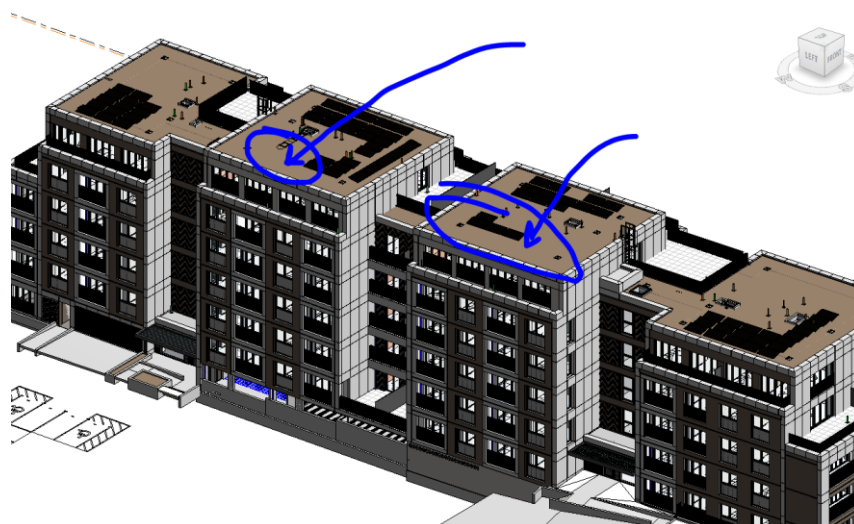
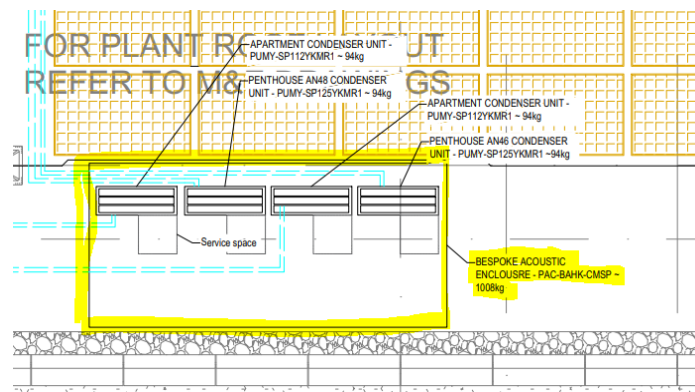


Block A

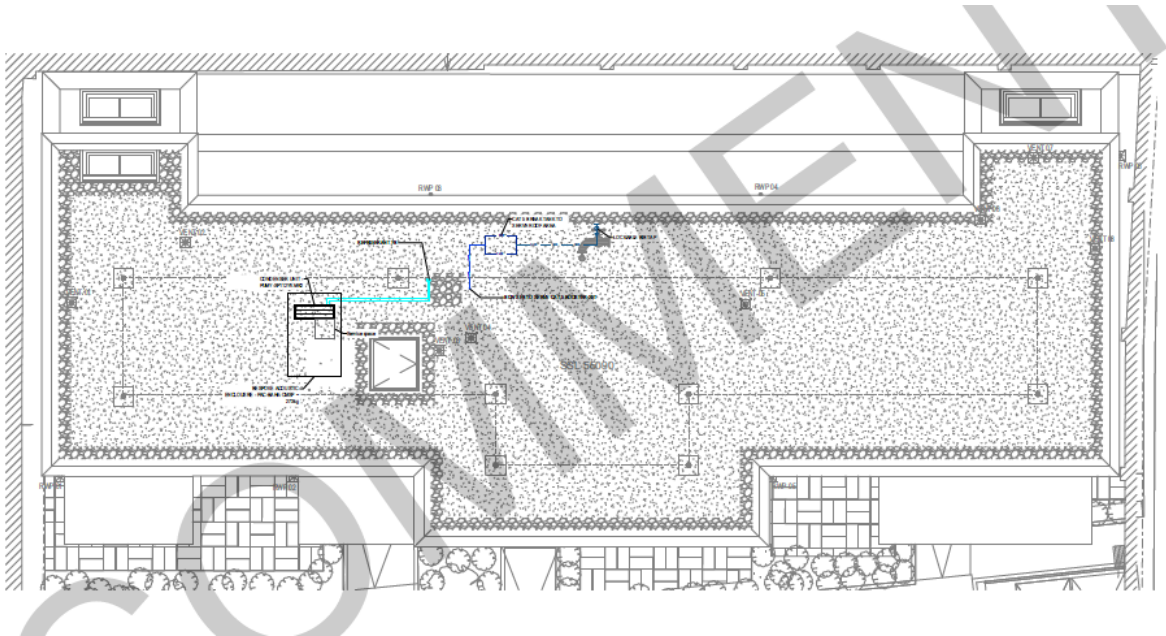
Energy Centre



Roof condensers



Mews



Noise levels information.

ID	63	125	250	500	1 k	2k	4 k	8 k
REF LG 01	46.2	48.1	48	39.8	47	45.8	41	33.1
TEF LG 02	46.2	48.1	48	39.8	47	45.8	41	33.1
HRU LG 03 Intake	66	55	48	49	55	48	40	36
HRU LG 03 Exhaust	71	68	58	60	61	58	53	51
TEF LG 01	55.2	66.1	58	55.8	59	58.8	55	52.1
TEF LG 03	55.2	66.1	58	55.8	59	58.8	55	52.1
HRU LG 02 Intake	58	47	40	52	52	39	30	30
HRU LG 02 Exhaust	66	63	65	68	70	66	62	55
HRU G 02 Intake	55	54	50	49	51	45	30	30
HRU G 02 Exhaust	67	66	69	72	71	72	68	69
HRU G 01 Intake	60	48	42	53	53	40	30	30
HRU G 01 Exhaust	68	64	66	70	71	67	64	56
HRU G 05 Intake	63.2	53.1	48.6	37.8	35	30.8	35	34.1
HRU G 05 Exhaust	61.2	51.1	48.6	50.8	54	51.8	47	44.1
HRU G 03 Intake	64.2	54.1	52.6	38.8	37	31.8	36	35.1
HRU G 03 Exhaust	62.2	52.1	57.6	51.8	57	52.8	48	45.1
HRU G 04 Intake	61.2	51.1	49.6	35.8	34	28.8	33	32.1
HRU G 04 Exhaust	59.2	49.1	55.6	49.8	53	49.8	46	42.1
HRU 01 03 Intake	36	33	30	30	30	30	30	30
HRU 01 03 Exhaust	47	45	46	48	49	44	36	30
AHU 02 02 Intake	71	70	71	70	57	54	51	55
AHU 02 02 Exhaust	78	77	83	81	80	76	72	74
AHU 01 01 Intake	65	68	68	60	54	52	47	45
AHU 01 01 Exhaust	76	78	76	76	75	73	70	65
KEF 01 01	73	71	71	67	66	64	56	50
HRU 01 02 Intake	36	33	30	30	30	30	30	30
HRU 01 02 Exhaust	47	45	46	48	49	44	36	30
AHU RF 03 Intake	70	70	74	72	65	61	58	52
AHU RF 03 Exhaust	65	73	74	69	66	64	58	54

ID	63	125	250	500	1 k	2k	4 k	8 k
ARU 01 01 Intake	63.2	53.1	51.6	37.8	36	31.8	35	34.1
ARU 01 01 Exhaust	36	36	49	55	55	53	49	43
TSF 02 01	46.2	48.1	51.6	39.8	47	45.8	41	33.1
TEF 01 02 and 03	56.2	43.1	43.6	34.8	38	33.8	26	21.1
TEF 02 02	56.2	43.1	43.6	34.8	38	33.8	26	21.1
AHU 02 03 Intake	68	75	72	67	61	57	51	50
AHU 02 03 Exhaust	78	86	80	81	78	75	72	68
SF LG 01 Intake	74.2	64.1	62.6	48.8	47	42.8	46	45.1
SF LG 01 Exhaust	71.2	61.1	66.6	60.8	63	58.8	50	46.1
HRU 02 01 Intake	57	58	59	44	48	37	30	30
HRU 02 01 Exhaust	62	66	68	66	66	63	60	55
AHU 02 01 Intake	64	60	65	63	56	51	47	46
AHU 02 01 Exhaust	71	73	76	75	75	71	67	66
TEF 02 01	20	32	43	43	47	47	42	32
AHU RF 02 Intake	59	68	70	61	55	54	47	45
AHU RF 02 Exhaust	71	83	79	77	77	76	73	67
AHU RF 06 Intake	54	56	56	54	49	44	39	37
AHU RF 06 Exhaust	59	65	65	65	67	63	58	55
AHU RF 01 Intake	63	61	63	62	55	50	46	44
AHU RF 01 Exhaust	63	61	63	62	55	50	46	44
AHU RF 04 Intake	63	52	46	57	56	43	30	30
AHU RF 04 Exhaust	71	68	70	74	75	70	67	60
AHU RF 05 Intake	52	52	60	54	51	44	39	35
AHU RF 05 Exhaust	53	61	65	63	65	62	57	53

Insertion Losses attenuators

Atmospheric side									
Unit		63	125	250	500	1k	2k	4k	8k
AHU/01/01	Discharge	13	19	36	50	50	50	48	32
AHU/01/01	Intake	13	19	36	50	50	50	48	32
AHU/02/03	Discharge	18	31	47	50	50	50	50	40
AHU/02/03	Intake	15	25	46	50	50	50	50	40
TEF/02/02	Extract	9	12	21	32	42	38	30	21
HRU/G/01	Discharge	9	12	21	32	42	38	30	21
HRU/G/01	Intake	7	10	15	22	38	30	23	16
HRU/G/02	Discharge	9	12	21	32	42	38	30	21
HRU/G/02	Intake	6	9	18	37	42	34	23	19
AHU/RF/01	Intake	6	9	18	37	42	34	23	19
AHU/RF/01	Discharge	6	9	18	37	42	34	23	19
AHU/RF/02	Intake	6	9	18	37	42	34	23	19
AHU/RF/02	Discharge	10	14	27	41	45	45	36	25
AHU/RF/03	Discharge	10	14	27	41	45	45	36	25
AHU/RF/03	Intake	10	14	27	41	45	45	36	25
AHU/RF/04	Discharge	6	8	15	33	43	25	15	11
AHU/RF/04	Intake	6	8	15	33	43	25	15	11
AHU/RF/05	Discharge	10	14	27	41	45	45	36	25
AHU/RF/05	Intake	5	7	15	31	34	25	18	14
AHU/RF/06	Discharge	5	7	15	31	34	25	18	14
AHU/RF/06	Intake	5	7	15	31	34	25	18	14

AHU/02/02	Discharge	11	17	31	49	50	50	43	28
AHU/02/02	Intake	11	17	31	49	50	50	43	28
HRU/02/01	Discharge	9	12	21	32	42	38	30	21
HRU/02/01	Intake	7	10	15	22	38	30	23	16
HRU/01/03	Discharge	7	10	15	22	38	30	23	16
HRU/01/03	Intake	7	10	15	22	38	30	23	16
TEF/01/01	Extract	No attenuation required							
HRU/01/01	Discharge	7	10	15	22	38	30	23	16
HRU/01/01	Intake	5	5	10	15	18	15	11	7
HRU/01/02	Discharge	7	10	15	22	38	30	23	16
HRU/01/02	Intake	5	5	10	15	18	15	11	7
HRU/G/05	Discharge	7	10	15	22	38	30	23	16
HRU/G/05	Intake	7	10	15	22	38	30	23	16
REF/LG/01	Discharge	7	10	15	22	38	30	23	16
TEF/LG/01	Discharge	No attenuation required							
TEF/LG/02	Discharge	No attenuation required							
TEF/01/03	Discharge	No attenuation required							
TEF/01/02	Discharge	No attenuation required							
TEF/02/01	Discharge	4	6	8	13	20	21	18	16
TSF/02/01	Intake	7	10	15	22	38	30	23	16
HRU/G/04	Discharge	7	10	15	22	38	30	23	16
HRU/G/04	Intake	7	10	15	22	38	30	23	16
HRU/G/03	Discharge	9	12	21	32	42	38	30	21
HRU/G/03	Intake	5	5	10	15	18	15	11	7
TEF/LG/03	Discharge	No attenuation required							
HRU/LG/02	Discharge	10	14	27	41	45	45	36	25
HRU/LG/02	Intake	7	10	15	22	38	30	23	16
KEF/01/01	Discharge	11	17	31	49	50	50	43	28
SF/LG/01	Intake	7	10	15	22	38	30	23	16
SF/LG/01	Discharge	7	10	15	22	38	30	23	16
Note	Town Hall Acoustic barrier height 2100 mm, density minimum 12 kg/m²								

Condensers noise levels and acoustic enclosure sound reduction.

Town Hall

Outdoor Unit	Acoustic enclosure minimum Noise Reduction dBA	Adjusted dBA level
PUHY-P500YNW-A	8	70.5
PUHY-P350YNW-A	8	68.5
PUHY-P300YNW-A	8	67
PUHY-P300YNW-A	8	67
PURY-P350YNW-A	8	67.5
PURY-P200YNW-A	8	62.5
PUZ-ZM60VHA		
PURY-P350YNW-A	8	67.5
PUHZ-ZRP250YKA	18	59
PUHZ-ZRP250YKA	18	59
PUHZ-ZRP250YKA	18	59
PUHZ-ZRP250YKA	18	59
PUHZ-ZRP250YKA	18	59
PUHZ-ZRP200YKA	18	59
PUHZ-ZRP200YKA	18	59
PURY-P600YSNW-A	18	65
PURY-P600YSNW-A	18	65
PURY-M500YNW-A	8	68.5
PURY-M500YNW-A	8	68.5
PURY-M500YNW-A	8	68.5
PURY-M500YNW-A	8	68.5
PUHZ-ZRP200YKA		70.4
PUHZ-ZRP200YKA		70.4
PUHZ-ZRP200YKA		70.4
PUZ-ZM35VKA		58
PUZ-ZM35VKA		58

Black A and Mews

Block	Location	Model	Acoustic enclosure minimum Noise Reduction dBA	Adjusted sound levels dBA
Block A	South 1/1	PUMY-SP140YKM	18	56
Block A	South 1/2	PUMY-SP112YKM	18	54
Block A	AS41	PUMY-SP125YKM	18	55
Block A	AS43	PUMY-SP125YKM	18	55
Block A	North 1/1	PUMY-SP112YKM	18	54
Block A	North 1/2	PUMY-SP112YKM	18	54
Block A	AN46	PUMY-SP125YKM	18	55
Block A	AN48	PUMY-SP125YKM	18	55
Mews	Mews	PUMY-SP112YKM	18	54

Block A Energy Centre

Plant units noise levels information.

CHP.

Engine surface noise **	72,0	dB(A) ⁽⁷⁾
Exhaust outlet noise after primary muffler **	84	dB ⁽⁷⁾
Safety temperature limiter	100	°C

5 Sound reducing encapsulation

sound encapsulation temperature (max.)	80	°C
sound pressure level ***	55	dB(A)

Gas Boilers

Sound Power Level ⁽⁴⁾		
Heating noise (EN 15036 part 1) (room air dependent)	76	dB(A)
Exhaust flue noise radiated from the spigot	75	

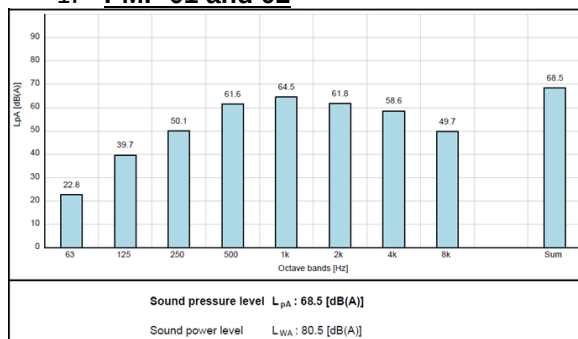
Ventilation Plant Room Fan.

	Sound Spectrum (Hz)								Overall	
	63	125	250	500	1k	2k	4k	8k	Lw*	LpA @ 3 m**
Inlet*	72	68	77	74	72	71	70	67	81	58
Outlet*	72	68	77	74	72	71	70	67	81	58
Breakout*	64	52	57	54	52	50	55	48	66	39

Ventilation Plant AHU.

SOUND POWER LEVELS (standard: EN13053 ISO/CD 13347-2)									
Octave band (Hz)	Lw per octave band (dB)								LwA
	63	125	250	500	1k	2k	4k	8k	dB(A)
Fresh air connection	56	59	78	69	59	62	59	58	72
Supply air connection	65	67	73	69	72	69	67	65	76
To surroundings	47	50	64	48	34	44	39	30	56

1. PMP 01 and 02



Energy Centre Attenuation.

Attenuators IL dB.

ID	63	125	250	500	1k	2k	4k	8k
Fan Ventilation Room	11	17	32	49	48	48	42	26
AHU Ventilation Room	11	17	32	49	48	48	42	26
Boilers	7	10	15	22	38	30	23	16

Louvres

The louvres within the plant room discharging externally should be selected to have a sound rating of R_w 35 dB.

Emergency Smoke Extract Fans. (Noise levels provided by Group SCS)

1 x extract fan at Block A (operating at low speed) with sound pressure level 45 dBA at 5 m (outlet) is below the recommended criteria, and therefore no additional attenuation will be required.

1 x extract fan at Block B (operating at low speed) with sound pressure level 44 dBA at 3 m (outlet) is also below the recommended criteria, and therefore no additional attenuation will be required.

Example of noise propagation calculations Receptor NR14

Source	Source type	L'w dB(A)	Lw dB(A)	S m	Adiv dB	Agr dB	Abar dB	Ls dB(A)	Lr dB(A)
Mews PUMY-	Point	60.7	60.7	95.06	-50.6	3	-19.7	-7.2	-7.2
AHU-01-01 Exhaust	Point	31.1	31.1	57.05	-46.1	3	-24.6	-37.3	-37.3
AHU-01-01 Intake	Point	34.4	34.4	57.48	-46.2	3	-20.4	-29.4	-29.4
AHU-02-01 Exhaust	Point	50.2	50.2	79.33	-49	3	-14.6	-10.6	-10.6
AHU-02-01 Intake	Point	43.3	43.3	81	-49.2	3	-14.4	-17.4	-17.4
AHU-02-03 Exhaust	Point	39.4	39.4	94.88	-50.5	3	-11.9	-20.1	-20.1
AHU-02-03 Intake	Point	32.9	32.9	94.34	-50.5	3	-11.1	-25.7	-25.7
AHU-RF-01 Exhaust	Point	38.9	38.9	59.09	-46.4	3	-12.5	-17.1	-17.1
AHU-RF-01 Intake	Point	38.9	38.9	58.2	-46.3	3	-13.2	-17.7	-17.7
AHU-RF-02 Exhaust	Point	52.5	52.5	55.47	-45.9	3	-8.5	1.1	1.1
AHU-RF-02 Intake	Point	45.3	45.3	57.3	-46.2	3	-8.6	-6.5	-6.5
AHU-RF-03 Exhaust	Point	41.5	41.5	57.84	-46.2	3	-20.7	-22.5	-22.5
AHU-RF-03 Intake	Point	40	40	58.36	-46.3	3	-20.8	-24.1	-24.1
AHU-RF-04 Exhaust	Point	55.4	55.4	54.16	-45.7	3	-19.5	-7.2	-7.2
AHU-RF-04 Intake	Point	31.1	31.1	53.26	-45.5	3	-11.3	-22.7	-22.7
AHU-RF-05 Exhaust	Point	33.9	33.9	49.39	-44.9	3	-14.5	-22.5	-22.5
AHU-RF-05 Intake	Point	37	37	48.59	-44.7	3	-15.2	-20	-20
AHU-RF-06 Exhaust	Point	47.4	47.4	59.49	-46.5	3	-14.8	-11	-11
AHU-RF-06 Intake	Point	35.4	35.4	58.1	-46.3	3	-13.1	-21	-21
Block A PUMY-	Point	60.7	60.7	93.76	-50.4	3	-16.2	-3.4	-3.4
Block A PUMY-	Point	60.7	60.7	93.62	-50.4	3	-12.6	0.3	0.3

Block A PUMY-	Point	60.7	60.7	92.43	-50.3	3	-11.4	1.6	1.6
Block A PUMY-	Point	61.7	61.7	92.38	-50.3	3	-8.8	5.2	5.2
Block A PUMY-	Point	61.7	61.7	93.47	-50.4	3	-12.8	1.1	1.1
Block A PUMY-	Point	61.7	61.7	92.43	-50.3	3	-10.1	3.9	3.9
Block A PUMY-	Point	61.7	61.7	93.38	-50.4	3	-12.9	1	1
Block A PUMY-	Point	62.7	62.7	92.51	-50.3	3	-12.3	2.6	2.6
Energy Centre (1 of 5)	Area	48.7	52.7	91.91	-50.3	3.7	-20.5	-14.8	-14.8
Energy Centre (2 of 5)	Area	53.3	52.7	92.74	-50.3	4.4	-23.1	-16.9	-16.9
Energy Centre (2 of 5)	Area	53.3	52.7	110.77	-51.9	4.6	-25	-20.3	-20.3
Energy Centre (3 of 5)	Area	63.1	52.7	93.44	-50.4	4.2	-23.4	-17.4	-17.4
Energy Centre (4 of 5)	Area	51.7	52.7	94.71	-50.5	3.9	-23.3	-17.8	-17.8
Energy Centre (5 of 5)	Area	51.7	52.7	112.06	-52	4.6	-24.8	-20.3	-20.3
HRU-01-01 Exhaust	Point	43.1	43.1	82.27	-49.3	3	-18.8	-22.1	-22.1
HRU-01-01 Intake	Point	32.7	32.7	82.66	-49.3	3	-18.8	-32.5	-32.5
HRU-01-02 Exhaust	Point	22.3	22.3	79.66	-49	3	-21.3	-45.3	-45.3
HRU-01-02 Intake	Point	22.2	22.2	80	-49.1	3	-24.2	-50.8	-50.8
HRU-01-03 Exhaust	Point	15	15	83.05	-49.4	3	-20	-51.6	-51.6
HRU-01-03 Intake	Point	6.2	6.2	82.61	-49.3	3	-21.5	-63	-63
HRU-02-01 Exhaust	Point	47.6	47.6	81.32	-49.2	3	-16.2	-15	-15
HRU-02-01 Intake	Point	36.4	36.4	82.76	-49.3	3	-14.2	-24.2	-24.2
HRU-02-02 Exhaust	Point	48.9	48.9	83.5	-49.4	3	-21.2	-19.5	-19.5
HRU-02-02 Intake	Point	38.1	38.1	83.63	-49.4	3	-19	-27.4	-27.4
HRU-G-01 Exhaust	Point	34.9	34.9	24.8	-38.9	3	0	-1.6	-1.6
HRU-G-01 Intake	Point	21.4	21.4	26.94	-39.6	3	0	-15.2	-15.2
HRU-G-02 Exhaust	Point	38.8	38.8	35.18	-41.9	3	-14.1	-15.2	-15.2
HRU-G-02 Intake	Point	17.7	17.7	29.72	-40.5	3	0	-19.9	-19.9
HRU-G-03 Exhaust	Point	21.4	21.4	77.6	-48.8	3	-17.8	-42.4	-42.4
HRU-G-03 Intake	Point	30.3	30.3	80.07	-49.1	3	-17.3	-33.2	-33.2
HRU-G-04 Exhaust	Point	25.9	25.9	82.68	-49.3	3	-20.5	-41.4	-41.4
HRU-G-04 Intake	Point	23.3	23.3	82.37	-49.3	3	-17.3	-40.3	-40.3
HRU-G-05 Exhaust	Point	54.5	54.5	52.26	-45.4	3	-24.9	-13.3	-13.3
HRU-G-05 Intake	Point	40.1	40.1	53.31	-45.5	3	-22.7	-25.5	-25.5
HRU-LG-02 Exhaust	Point	41.7	41.7	23.83	-38.5	3	0	6.1	6.1
HRU-LG-02 Intake	Point	25.2	25.2	24.13	-38.6	3	0	-10.5	-10.5
HRU-LG-03 Exhaust	Point	32.8	32.8	91.39	-50.2	3	-17	-31.5	-31.5
HRU-LG-03 Intake	Point	26.8	26.8	88.44	-49.9	3	-12.4	-32.6	-32.6
KEF-01-01	Point	38.9	38.9	79.93	-49	3	-17.9	-25.1	-25.1
Plant Room (1 of 3)	Area	25	26	108.68	-51.7	-4.4	-20.5	-47.9	-47.9
Plant Room (1 of 3)	Area	25	21.8	107.29	-51.6	-4.5	-20.4	-51.9	-51.9
Plant Room (2 of 3)	Area	25	21.8	107.94	-51.7	-4.5	-20.4	-52	-52
PUHZ-ZRP200YKA	Point	69.7	69.7	65.53	-47.3	3	-21.8	3.2	3.2
PUHZ-ZRP250YKA	Point	65.7	65.7	70.37	-47.9	3	-21	-0.6	-0.6
PUHZ-ZRP250YKA	Point	65.7	65.7	69.71	-47.9	3	-21.2	-0.7	-0.7
PUHZ-ZRP250YKA	Point	65.7	65.7	68.55	-47.7	3	-21.9	-1.2	-1.2
PUHZ-ZRP250YKA	Point	65.7	65.7	69.05	-47.8	3	-21.5	-0.9	-0.9
PURY-M200YNW-A	Point	69.7	69.7	68.01	-47.6	3	-20.7	4.1	4.1
PURY-M500YNW-A	Point	77.7	77.7	54.36	-45.7	3	-14.1	20.6	20.6
PURY-M500YNW-A	Point	77.7	77.7	51.96	-45.3	3	-15	20.2	20.2
PURY-M500YNW-A	Point	77.7	77.7	53.9	-45.6	3	-14.2	20.6	20.6
PURY-M500YNW-A	Point	77.7	77.7	52.64	-45.4	3	-15	20	20
PURY-M600YNW-A	Point	71.7	71.7	65.74	-47.3	3	-20	7.1	7.1
PURY-M600YNW-A	Point	71.7	71.7	64.55	-47.2	3	-14.1	13.1	13.1
PURY-P350YNW-A	Point	74.7	74.7	67.47	-47.6	3	-22.1	7.7	7.7
PUZ-ZM60VHA	Point	53.7	53.7	52.16	-45.3	3	-21.6	-10.5	-10.5
REF-LG-01	Point	27.7	27.7	77.9	-48.8	3	-20.9	-39.3	-39.3
TEF-01-01	Point	41.5	41.5	59	-46.4	3	-23.7	-25.8	-25.8
TEF-01-02 and 03	Point	41.5	41.5	45.62	-44.2	3	-23.6	-23.4	-23.4
TEF-02-01	Point	33.3	33.3	35.23	-41.9	3	-0.8	-6.8	-6.8
TEF-02-02	Point	41.5	41.5	96.17	-50.7	3	-17.3	-23.6	-23.6
TEF-LG-01	Point	60.8	60.8	60.58	-46.6	3	-24.9	-8.4	-8.4
TEF-LG-02	Point	51.1	51.1	87.32	-49.8	3	-22.6	-18.8	-18.8

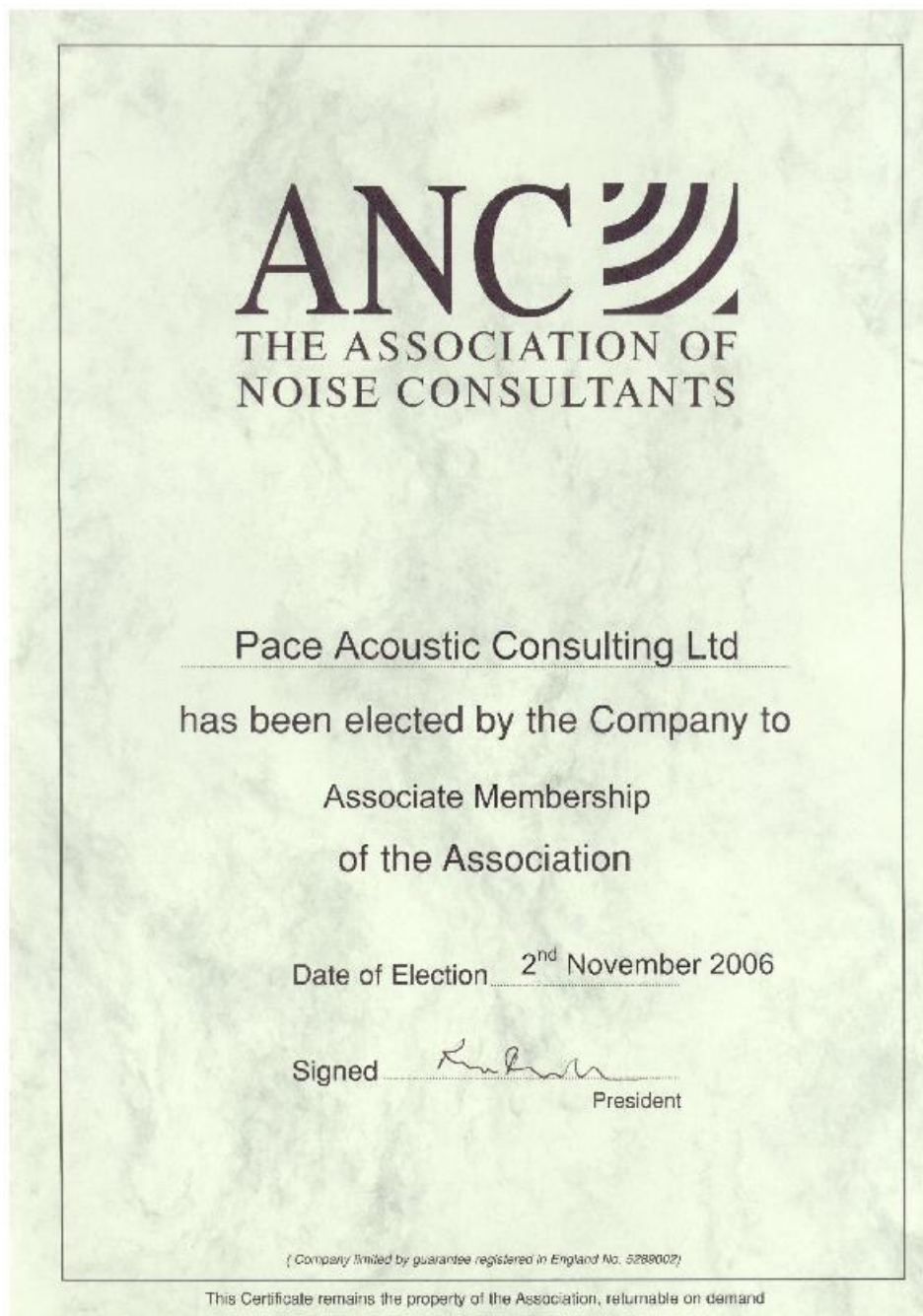
TEF-LG-03	Point	60.7	60.7	36.95	-42.3	3	0	20.8	20.8
TSF-02-01	Point	27.5	27.5	37.13	-42.4	3	0	-12.1	-12.1
Cumulative Noise levels 28 dBA									

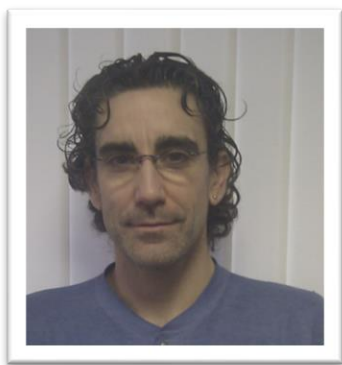
The figure below shows the legend of the acoustic parameters.

Legend

Source		Source name
Source type		Type of source (point, line, area)
L'w	dB(A)	Sound power level per m, m ²
Lw	dB(A)	Sound power level per unit
S	m	Distance source - receiver
Adiv	dB	Mean attenuation due to geometrical spreading
Agr	dB	Mean attenuation due to ground effect
Abar	dB	Mean attenuation due to screening
Ls	dB(A)	Unassessed sound pressure level at receiver $L_s = L_w + K_o + A_{DI} + A_{div} + A_{gr} + A_{bar} + A_{atm} + A_{fol_site_house} + A_{wind} + d_{Lrefl}$
Lr	dB(A)	Assessed level of time slice

The author is a corporate member of the Institute of Acoustics (IOA) which satisfies the experience and qualification requirements for a 'suitably qualified acoustician'. Pace Consult are also full member of the Association of Noise Consultants.





Curriculum vitae Dr Joan-Carles Blanco

Year of birth	1969
Profession	Acoustic Consultant
Position	Associate Director
Nationality	Catalan

Background

I am a qualified acoustic consultant and corporate member of the UK Institute of Acoustics. I have extensive experience working to British and International Standards in a wide range of projects that include Building and Environmental Acoustics, working collaboratively with a number of global companies. I have delivered a number of scientific presentations in the field of acoustics whilst holding senior academic positions at recognised Centres of excellence in research throughout the world.

Professional history

2018 – Present Associate Director – Pace Consult Ltd.

2010 – 2018 Acoustic Consultant - Pace Acoustics Consult Ltd.

2010 (Part Time) - Acoustic Consultant - Ryedale Air & Acoustic Testing Ltd.

2006 – 2009 Acoustic Consultant - Premier Measurements Ltd.

2003 – 2016 Visiting Researcher ISVR (Institute of Sound and Vibration Research),
Southampton University.

Brief Non Exhaustive Project summary

Healthcare

- PCT Houghton Le Spring (Houghton Le Spring), Willmott Dixon Construction Ltd.
- Garston Health Care Centre (Garston), Galliford Try Construction North.
- JAC White City, Primary Health Centre, TACE.
- Rugby and Daventry Crematorium and Cemetery (Daventry), Willmott Dixon Construction Ltd.
- St Benedict Hospice (Sunderland), Willmott Dixon Construction Ltd.
- Waltham Cross Care Centre. Conomar.
- Derriford Hospital, Plymouth. MTX.
- Croydon University Hospital, Galliford Try Southern.
- Royal Derby Hospital, Galliford Try

Residential

- Heathside & Lethbridge Phases 2-6 - Ardmore Construction Ltd.
- Taberner House, Croydon, Henry Construction Ltd.
- Pembury Circus, Ardmore Construction Ltd.
- Plot M0101 Greenwich Peninsula, Ardmore Construction Ltd.
- 85 Canonbury Road, London, Ardmore Construction Ltd.
- Hornsey Town Hall project, Ardmore Construction Ltd.
- Stag House, London, Rydon Construction Ltd.
- Old War Office, Whitehall. (Contract value £500 m), Ardmore Construction Ltd.
- Whiteleys, Ardmore.
- West Cromwell Road, (Contract value £205 m), Ardmore.
- Kidbrooke Station Square (Contract value £100 m), Ardmore.
- West King Street Renewal (Contract value £155 m), Ardmore.
- Gateway House, Wickford, Horizon Group.
- Talacre, Camden Council.
- 52-54 New Cross Road, London, Charles Edward Ltd
- YMCA Wimbledon, Thornsett
- St Olaves, Thomas Sinden
- Birmingham Children's Trust - Secure housing, Willmott Dixon Construction.

Office

- Hornsey Town Hall, Ardmore Construction Ltd.
- West King Street, Hammersmith, Ardmore Construction Ltd.
- Design District, Greenwich Peninsula. Ardmore Construction Ltd.
- Diamond Point, Galliford try.
- Silbury house, Thomas Sinden.
- Dover Beacon, Jenner Group

Hospitality

- 27-35 Poultry, Ardmore Construction Ltd.
- Hornsey Town Hall project, Ardmore Construction Ltd.
- West King Street, London, Ardmore Construction Ltd.

- Stratford Apart Hotel, Silver Mascot.
- 27 Commercial Road, Ardmore Construction Ltd.
- Lion House, London, Galliford Try Ltd.
- 8 Eaton Lane Grosvenor Gardens House (Contract Value £92 m), Ardmore.
- Carrington Street (Contract Value £71 m), Ardmore.
- Cambridge House (Contract value £135 m), Ardmore.
- The Sloane Club, AMICUS Property.

Educational

- Oxford Academy (Oxford), Willmott Dixon Construction Ltd.
- Skinners Academy (Hackney), Willmott Dixon Construction Ltd.
- Landau Forte Academy (Tamworth), Willmott Dixon Construction Ltd.
- Knole Academy (Kent), Willmott Dixon Construction Ltd.
- Wilmington Academy (Dartford), Willmott Dixon Construction Ltd.
- The Grange (Hartford), Galliford Try Ltd.
- Old Moat Community School (Manchester), Willmott Dixon Construction Ltd.
- Food Heritage Centre (Spalding), Willmott Dixon Construction Ltd.
- Beverley & Tollesby School (Middlesbrough), Willmott Dixon Construction Ltd.
- Trinity Catholic College (Middlesbrough), Willmott Dixon Construction Ltd.
- Hope Academy (Newton-le-Willows), Willmott Dixon Construction Ltd.
- New College Pontefract (Pontefract), Britcon (Scunthorpe) Limited.
- The Priory Ruskin Academy (Grantham), Shepherd Construction.
- Park Lane Primary School (Wembley), Mansell Construction.
- John Wallis Academy (Ashford), Willmott Dixon Construction Ltd.
- Richmond Primary School (Richmond), IID Architects.
- Pilgrims Way School, Morgan Sindall
- Brunswick Community Primary School, Tilbury Douglas Construction Ltd.
- Watermill SEN School, Seddon Construction Ltd.
- Lakers - Short Breaks Centre, Neilcott.
- Limpsfield Grange School, Morgan Sindall
- Cressing Primary School, Ingleton Wood.
- The Gilbert School, Colchester, TJ EVERS.
- Junior King's School, FANSHAWE.
- Grove Park SEND School, Willmott Dixon Construction.
- Coalville School, Stepnell Construction.
- Oakley Grove School, Willmott Dixon Construction.

Leisure

- Sowerby Bridge Leisure Centre (Calderdale), Willmott Dixon Construction Ltd.
- Redcar Community Heart & Leisure Centre (Redcar), Willmott Dixon Construction Ltd.
- Wakefield Leisure, Pontefract Park, GT3 Architects.
- Helensburgh Leisure Centre New Addington Leisure Centre. Willmott Dixon Construction Ltd.
- Littlehampton Leisure Centre, Willmott Dixon Construction Ltd.
- Slough Family Activity Centre, GT3 Architects.
- Langley Leisure Centre, GT3 Architects.
- Scarborough Leisure Centre, Willmott Dixon Construction Ltd.

- Middlesbrough Sport Village, Willmott Dixon Construction Ltd.
- Sheppey Leisure Centre, Willmott Dixon Construction Ltd.
- Wonford Health & Wellbeing Centre, Space & Place.
- Enniskillen Leisure Centre, Space & Place.
- Spelthorne Leisure Centre, Willmott Dixon Construction.

Transport Interchange.

- Huddersfield Bus Station. Willmott Dixon Construction.
- Leeds Bus Station. Willmott Dixon Construction.
- Halifax Bus Station. Willmott Dixon Construction.

Environmental Noise Impact Assessment. Including long term noise monitoring and 3D acoustic modelling.

- The Ned. Ardmere, Ardmere Construction, London.
- Metal and Waste Recycling Centre, Telford, Metal and Waste Recycling Ltd.
- Severnside Recycling, Basildon, Kenninghall Holdings Limited.
- Metal and Waste Recycling Centre, Epping, Kenninghall Holdings Limited.
- Recycling site Halesfield 2, Telford, Metal and Waste Recycling Ltd.
- 1 Cannon Row, Houses of Parliament, London, Willmott Dixon Interiors Ltd.
- University of Greenwich, London, Willmott Dixon Construction Ltd.
- 209-213 High Street, Dorking, Surrey, Pets at Home Ltd.
- Woodford Farm, Cross at Hand, Staplehurst, DHA Group.
- Waste Care Willenhall Lane Industrial Estate, Willenhall, WasteCare Ltd.
- Imperial Street, London, Lindhill and L & A Trad.
- Lockleaze Battery Storage Facility, HC ESS2 Ltd.
- Parham, Woodbridge, Power Plant, Noriker Power Ltd.
- Rufford, Nottinghamshire, Power Plant, Noriker Power Ltd.
- Monk's lane, Corsham, Wiltshire, Power Plant, Noriker Power Ltd.
- Repton Park, Ashford, Parcel EMP1, Persimmon Homes, South East.
- Greencore Prepared Meals, Warrington, Greencore Prepared Meals.
- University of Brighton, Moulsecoomb East Development, Bouygues UK.
- Hereford, Perseverance Rd, HR4 9SE. Power Plant, Noriker Power Ltd.
- Green Lane, Thurcroft, Power Plant, Noriker Power Ltd.
- Newcastle-Under-Lyme, Hamptons Ind Est Power Plant, Noriker Power Ltd.
- Mercury Theatre, Colchester Borough Homes.

Education

- PhD Industrial Engineering (2003)

Department of Industrial Engineering, Polytechnic University of Girona, Catalonia, Spain

- M.S Industrial Engineering (1998)

Department of Industrial Engineering, Polytechnic University of Girona, Catalonia, Spain.

- BSc Bachelor of Science (1994)

University of Barcelona, Barcelona, Catalonia, Spain

Memberships

M.I.O.A. Full Corporate Member of the Institute of Acoustics (UK)