Network Building London

Reserved Matters Application 1 - Class E(g)(i) Office Use
Plant Noise Assessment Report

27891/PNA/RMA1.Rev1

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For:
Derwent Valley Property Developments Limited

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Document Control

Rev	Date	Comment	Prepared by	Authorised by
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Attachments

1.0 Introduction

This RMA Plant Noise Assessment seeks planning permission for “Details of layout and appearance associated with the erection of an office building (E Class) comprising one basement level, ground floor and eight upper floors and associated cycle parking, servicing and all necessary enabling works.”

This should be read in conjunction with the submitted Outline Planning Application (OPA) Plant Noise Assessment 27891/PNA/OA, which established the principles and assessment of the land use proposed.

2.0 Objectives

To review data from a previous environmental noise survey to identify noise emission limits from the development with reference to the requirements of the Local Authority and/or the application of BS4142: 2014 and to minimise the possibility of noise nuisance to neighbours.

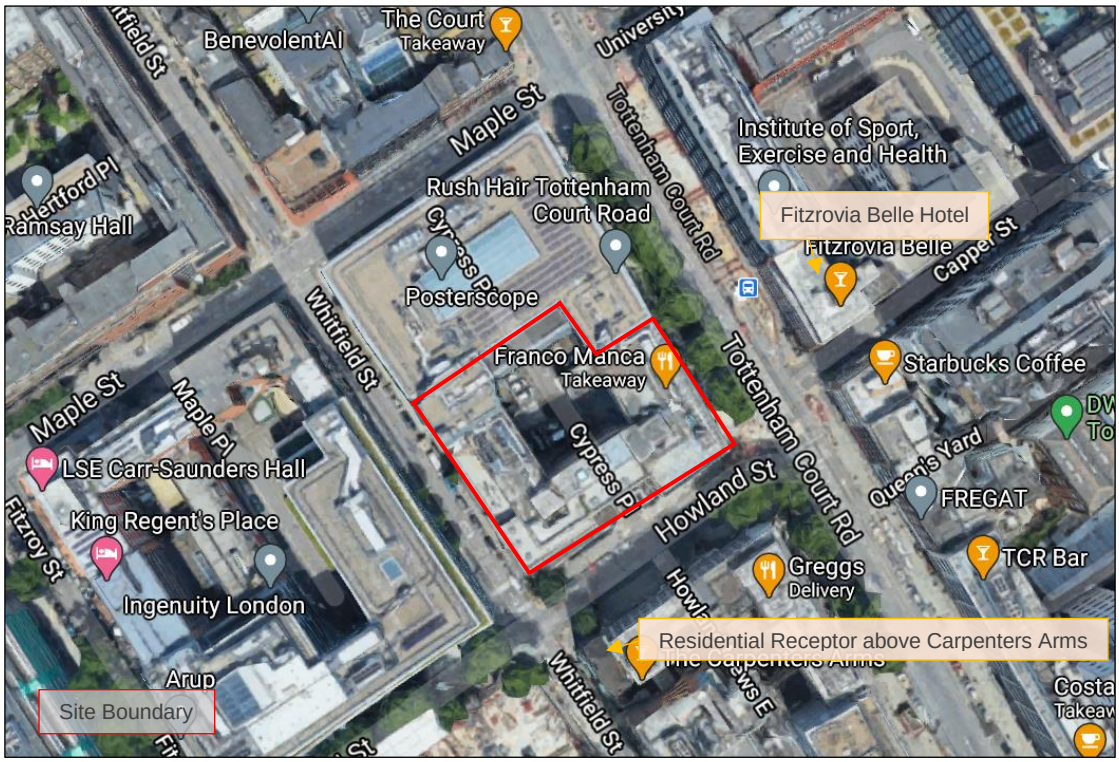
To assess the noise emissions of the proposed plant, based on data with which we are provided and comment on the acceptability.

To advise on noise control measures if required with reference to the requirements of the Local Authority.

3.0 Site Description

3.1 Location

The site is located at the Network Building, Tottenham Court Road and falls within the jurisdiction of the London Borough of Camden Council. See location map overleaf with neighbouring properties annotated.



Site plan (Google © 2020)

4.0 Acoustic Terminology

For an explanation of the acoustic terminology used in this report please refer to Appendix A enclosed.

5.0 Plant Noise Emission Criteria

5.1 Constantly Running Plant

On the basis of the requirements of the Local Authority (outlined in Section 5.4) above and the results of the environmental noise survey (see 28791/ADS1), we propose that the following plant noise emission criteria be achieved at 1 metre from the nearest noise sensitive residential window.

Position	Plant Noise Emission Criteria (dBA) At 1m from the nearest noise sensitive residential window	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
1	39dBA	37dBA
2	37dBA	35dBA
3	42dBA	42dBA

Position	Plant Noise Emission Criteria (dBA) At 1m from the nearest noise sensitive residential window	
	Daytime (07:00 – 23:00 hours)	Night-time (23:00 – 07:00 hours)
4	40dBA	39dBA

The above criteria are based on a level of 10dB below background in order to fall into Camden's 'Green' criteria for **dwellings**. Whilst we understand that Camden considers other uses noise sensitive, the Local plan states that the criteria is use dependent but does not define criteria that correspond to 'Green', 'Amber', or 'Red' for these other uses. We request that Camden clarify their policy in this respect. The criteria could be relaxed by 5dB in line with the 'Amber' criteria in Camden's Local Plan, which may be acceptable to Camden depending on 'the context of other merits of the development'.

It should be noted that the above are subject to the final approval of the Local Authority.

5.2 Commercial/Office Windows

The requirements of the London Borough of Camden (outlined in Section 5.4) states *"**Levels are given for dwellings, however, levels are use specific and different levels will apply dependant on the use of premises"* and does not offer specific guidance for office windows.

However, at the nearest commercial properties, it is generally acceptable to design plant such that the guidelines of BS 8233: 2014 "Sound insulation and noise reduction for buildings – Code of Practice" to be satisfied.

In relation to the commercial properties within the vicinity of the proposed location of the new plant, Table 6 of this standard states that for "reasonable conditions for study and work requiring concentration", the following internal ambient noise level design range should be satisfied.

Internal Ambient Noise Level Design Range, $L_{Aeq,T}$
35-50

In addition, BS 8233 states that attenuation of 10 to 15 dB can be provided by an open window. Hence the following external noise level criteria must be satisfied outside the nearest office façade (based on achieving the above design range):

External Ambient Noise Level Limit, $L_{Aeq,T}$
45-65

55dBA is generally as an acceptable external ambient noise level for plant installations to achieve outside and office window. It is also notable that we understand the surrounding offices are generally open plan and have sealed (non-openable) windows therefore a more relaxed criterion may be suitable.

It should be noted that the above criteria are subject to final approval by the London Borough of Camden.

5.3 Emergency and Standby Plant

For life safety standby plant, only used in emergencies and occasional testing - e.g. smoke extract fans and life safety generators - relaxations of the internal and external criteria are normally acceptable but should comply with Local Authority and occupational requirements and must not interfere with internal audible emergency alarms.

The Camden Local Plan (2017) states the following:

"6.100 Emergency equipment such as generators which are only to be used for short periods of time will be required to meet the noise criteria of no more than 10dB above the background level (L90 15 minutes)…"

The standby/emergency plant including the generator and smoke extraction plant should therefore not exceed the following noise criteria during monthly testing, which would usually be for periods less than one hour.

6.0 Plant Noise Impact Assessment

At the time of writing plant selections are not available, we will revise our report on receipt of these.

6.1 Plant Noise Data

Plant selections are currently to be decided, we will update our report on receipt of these. However, we understand the following items are likely to be installed on Level 08:-

- 4-pipe chillers (2 No. total);
- Life Safety Generator;
- Future Tenant Generator;
- Hot water generation plant;

- WC Ventilation AHUs;
- Firefighting Lobby Smoke Extract Fan;
- Basement Smoke Extract System;
- Future Kitchen Extract Fans;
- Future Office Condensers;
- Landlord Condensers and Future Retail Tenant Condensers.

The following items are currently proposed on Level 07:-

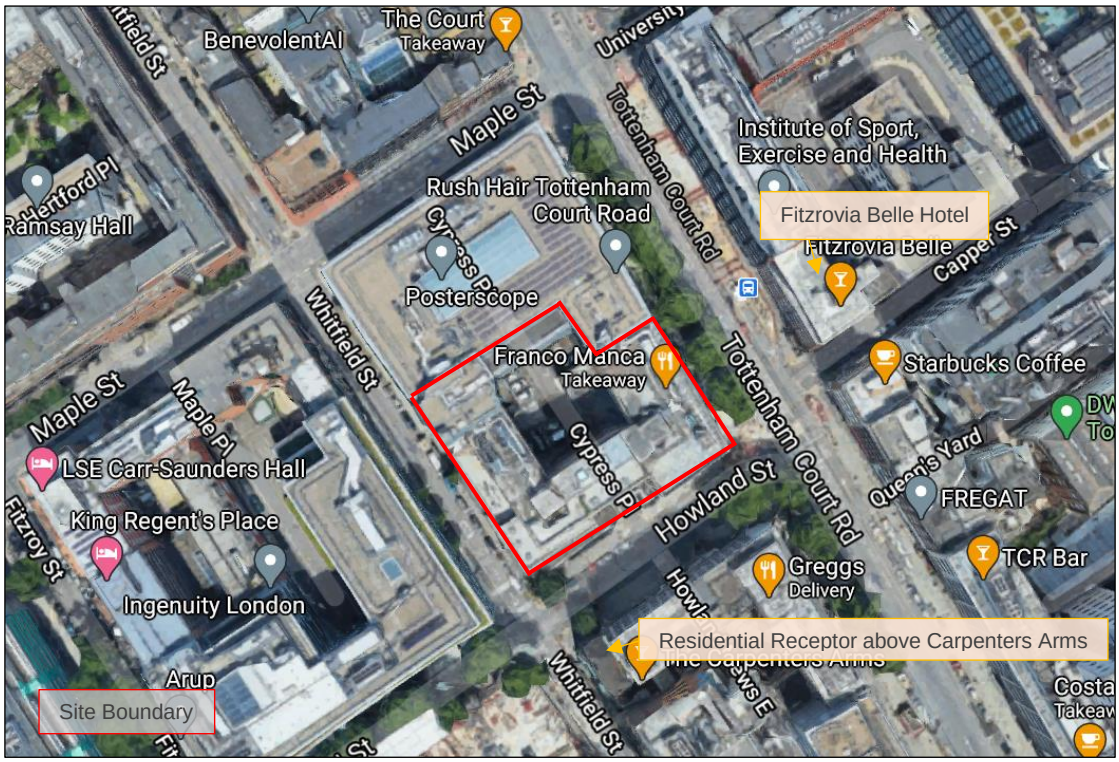
- LTHW Pumps and Associated Plant;
- CHW Pumps and Associated Plant.

6.2 Location of Plant

The plant is to be located in the Basement and Level 07, 08 roofs. At the time of writing the plant proposals and locations are being decided, therefore we have separated the level roof into the sections indicated in the enclosed plan, for which limiting noise levels will be specified which the selected plant should not exceed.

The nearest noise sensitive residential windows are located on the opposite site of Tottenham Court Road (Fitzrovia Belle Hotel) and Howland Street (above Carpenters Arms) to the east and south. The Fitzrovia Belle Hotel is approximately 6No storeys and 25m from the eastern edge of the roof a representative noise level for these is considered to be from Position 1. The Howland Street property is approximately 3No storeys and 20m from the southern edge of the roof a representative noise level for these is considered to be from Position 2.

The residential windows are shown in the plan and picture below.



Site plan (Google © 2020)

6.3 Mitigation Measures

The plant should be selected and attenuated such that the following cumulative limiting sound pressure levels displayed in the table below are not exceeded at 1m from any side of the installations with all plant operating simultaneously.

Unit Reference	Limiting Sound Pressure Level (dBA) at 1m		Limiting Sound Power Level (dBA) at 1m	
	Daytime	Night-Time	Daytime	Night-Time
Cumulative Plant Noise Emission Limit for Plant Area A	68 @ 1m	66 @ 1m	76	74
Cumulative Plant Noise Emission Limit for Plant Area B	67 @ 1m	65 @ 1m	75	73
Cumulative Plant Noise Emission Limit for Plant Area C	63 @ 1m	58 @ 1m	71	69

The following mitigation measures could be implemented to each item of plant achieve the noise levels above:-

- Suitable location of plant, for example, locating noisier items in Plant Area A;
- Suitable plant selection;
- In plant attenuation via casing/in-duct attenuators;

- Screening with imperforate screen (min mass per unit area 10kg/m^2) or acoustically louvred screening or a combination of both of these options.

Emergency plant and generators should be limited to 20dB above the above levels.

6.4 Plant Noise Impact Assessment

The following tables summarise our predictions of atmospheric noise emissions from the proposed plant installations to the nearest noise sensitive residential receptors.

6.4.1 Fitzrovia Hotel – Position 1

	Sound Pressure Level (dBA)	
	Daytime (07:00 – 23:00 hours)	**Night-time (23:00 – 07:00 hours)**
Cumulative Plant Noise Emission Limit for Plant Area A	68 @ 1m	66 @ 1m
Distance Correction (1m to 65m)	-36	-36
Barrier Correction	-5	-5
Plant Area A at receptor	27	25
Cumulative Plant Noise Emission Limit for Plant Area B	67 @ 1m	65 @ 1m
Distance Correction (1m to 35m)	-32	-32
Barrier Correction	-4	-4
Plant Area B at receptor	31	29
Cumulative Plant Noise Emission Limit for Plant Area C	63 @ 1m	58 @ 1m
Distance Correction (1m to 25m)	-28	-28
Barrier Correction	-3	-3
Plant Area C at receptor	32	30
[A+B+C] at receptor	36	34
Façade Reflection	+3	+3
Calculated Noise Level at Receptor	39	37

The assessment indicates that the proposed plant, subject to compliance with the indicated limiting noise levels and mitigation measures, should be capable of achieving the proposed environmental noise criteria at the nearest noise sensitive residential window (position 1 noise levels).

6.4.2 Above Carpenters Arms – Positon 2

	Sound Pressure Level (dBA)	
	Daytime (07:00 – 23:00 hours)	**Night-time (23:00 – 07:00 hours)**
Cumulative Plant Noise Emission Limit for Plant Area A	68 @ 1m	66 @ 1m
Distance Correction (1m to 40m)	-32	-32
Barrier Correction	-10	-10
Plant Area A at receptor	26	24
Cumulative Plant Noise Emission Limit for Plant Area B	67 @ 1m	65 @ 1m
Distance Correction (1m to 40m)	-32	-32
Barrier Correction	-12	-12
Plant Area B at receptor	23	21
Cumulative Plant Noise Emission Limit for Plant Area C	63 @ 1m	61 @ 1m
Distance Correction (1m to 40m)	-32	-32
Barrier Correction	-10	-10
Plant Area C at receptor	19	17
[A+B+C] at receptor	29	26
Façade Reflection	+3	+3
Calculated Noise Level at Receptor	32	30

The assessment indicates that the proposed plant, subject to compliance with the indicated limiting noise levels and mitigation measures, should be capable of achieving the proposed environmental noise criteria at the nearest noise sensitive residential window (position 2 noise levels).

6.4.3 To Office Windows Cypress Place Light Well

	Sound Pressure Level (dBA) Daytime (07:00 – 23:00 hours)
Cumulative Plant Noise Emission Limit for Plant Area A	68 @ 1m
Distance Correction (1m to 5m)	-14
Plant Area A at receptor	54
Cumulative Plant Noise Emission Limit for Plant Area B	67 @ 1m

	Sound Pressure Level (dBA) Daytime (07:00 – 23:00 hours)
Distance Correction (1m to 10m)	-20
Plant Area B at receptor	47
Cumulative Plant Noise Emission Limit for Plant Area C	63 @ 1m
Distance Correction (1m to 10m)	-20
Plant Area C at receptor	43
Calculated Noise Level [A+B+C] at Receptor	55

The assessment indicates that the proposed plant, subject to compliance with the indicated limiting noise levels and mitigation measures, should be capable of achieving the proposed noise criteria at the nearest noise sensitive commercial windows.

7.0 Conclusions

An environmental noise survey has been previously undertaken in order to establish the currently prevailing noise levels.

Plant noise emission criteria have been recommended based on the results of the noise survey and with reference to the Local Authority's requirements.

An assessment has been carried out to determine the plant noise emissions at the nearest noise sensitive windows.

The assessment indicates that the proposed plant, subject to compliance with the indicated limiting noise levels and mitigation measures, should be capable of achieving the proposed environmental noise criteria at the nearest noise sensitive residential window.

Appendix A

The acoustic terms used in this report are defined as follows:

dB — Decibel - Used as a measurement of sound level. Decibels are not an absolute unit of measurement but an expression of ratio between two quantities expressed in logarithmic form. The relationships between Decibel levels do not work in the same way that non-logarithmic (linear) numbers work (e.g. 30dB + 30dB = 33dB, not 60dB).

dBA — The human ear is more susceptible to mid-frequency noise than the high and low frequencies. The 'A'-weighting scale approximates this response and allows sound levels to be expressed as an overall single figure value in dBA. The $_A$ subscript is applied to an acoustical parameter to indicate the stated noise level is A-weighted

It should be noted that levels in dBA do not have a linear relationship to each other; for similar noises, a change in noise level of 10dBA represents a doubling or halving of subjective loudness. A change of 3dBA is just perceptible.

$L_{90,T}$ — L_{90} is the noise level exceeded for 90% of the period *T* (i.e. the quietest 10% of the measurement) and is often used to describe the background noise level.

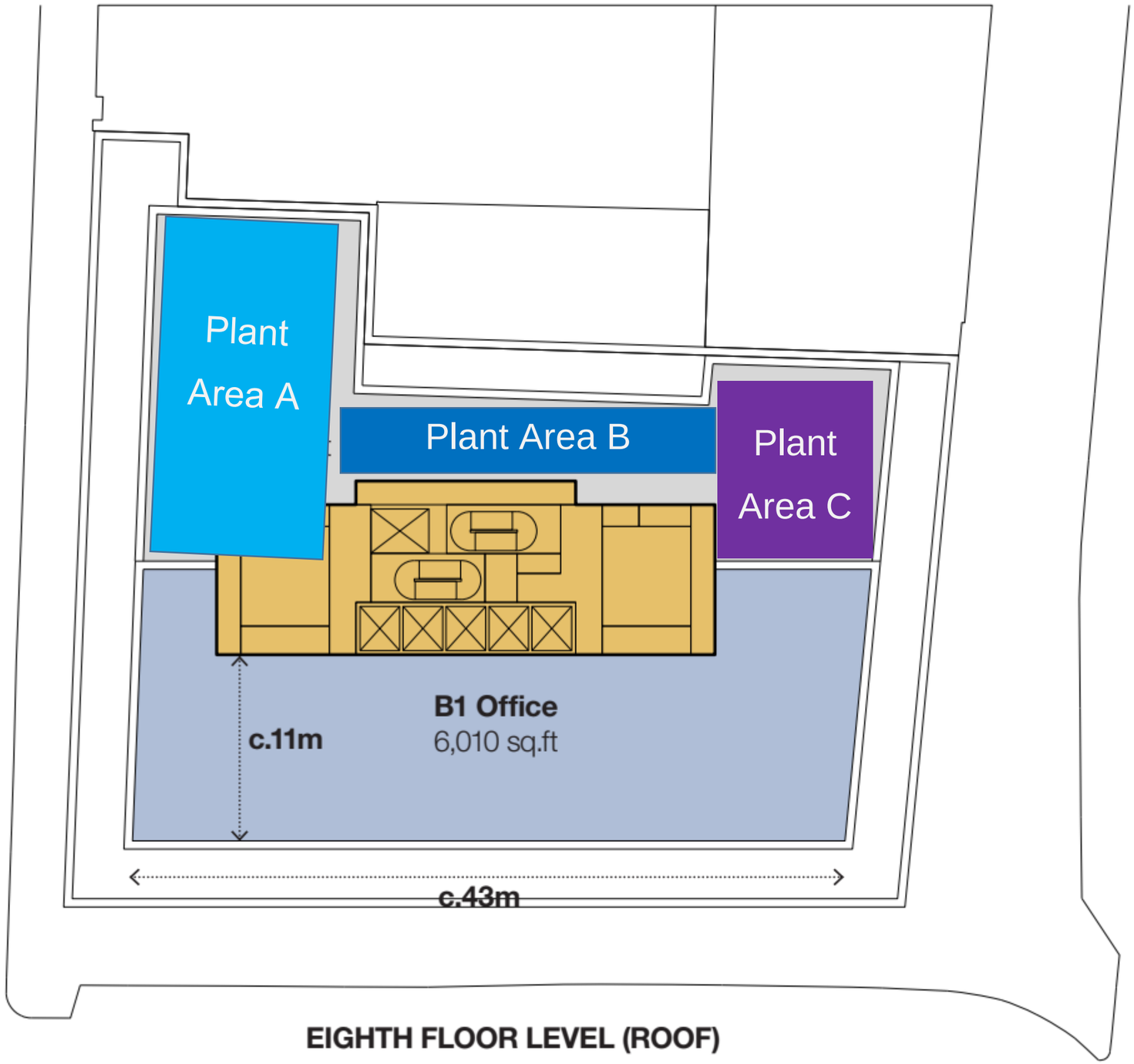
$L_{eq,T}$ — $L_{eq,T}$ is the equivalent continuous sound pressure level. It is an average of the total sound energy measured over a specified time period, *T*.

L_{max} — L_{max} is the maximum sound pressure level recorded over the period stated. L_{max} is sometimes used in assessing environmental noise where occasional loud noises occur, which may have little effect on the L_{eq} noise level.

Sound Pressure Level (L_p) is the sound pressure relative to a standard reference pressure of 2×10^{-5} Pa. This level varies for a given source according to a number of factors (including but not limited to: distance from the source; positioning; screening and meteorological effects).

Sound Power Level (SWL or L_w) is the total amount of sound energy inherent in a particular sound source, independent of its environment. It is a logarithmic measure of the sound power in comparison to a specified reference level (usually 10^{-12} W).

ROOF PLANT LAYOUTS



EIGHTH FLOOR LEVEL (ROOF)