

Plant Noise Impact Assessment

conversion of former Woodlands Beefeater Restaurant to McDonald's
217 Wrotham Road
Gravesend
D11 7LF



On Behalf



Project Ref: 8274 | Rev: 0 | Date: 23rd January 2026

Document Control Sheet

Project Name: conversion of building to McDonald's restaurant, 217 Wrotham Road, Gravesend, DA11 7LF

Project Ref: 8274

Report Title: Plant Noise Impact Assessment

Date: 23rd January 2026

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Contents

1	Non-technical summary	4
2	Introduction.....	6
2.1	Overview	6
2.2	Objectives.....	6
3	Planning Policy.....	6
3.1	Gravesham Borough Council.....	6
3.2	National Planning Policy Framework (NPPF)	6
3.3	Noise Policy Statement for England (NPSE)	7
3.4	Planning Practice Guidance (PPG).....	8
3.5	BS7445 Description and measurement of environmental noise	9
3.6	BS4142 Method for rating and assessing industrial and commercial sound	9
3.7	IEMA Guidelines for Environmental Noise Impact Assessment.....	10
3.8	Noise Criteria for on-site activity	11
4	Description potential noise impacts.....	11
5	Development Plan	12
6	Sound Measurements	13
6.1	Sound measurements	15
7	Fixed Plant Noise	15
7.1	Mechanical services plant	15
7.2	Plant mitigation & noise levels.....	17
8	Assessment of impacts	20
8.1	BS4142 assessment of impact of plant noise.....	20
8.2	Summary of Impact Assessment	20
9	Uncertainty effects on assessment conclusions	21
9.1	Residential neighbours existing sound climate.....	21
9.2	Assessment of plant noise.....	21
	Proposed site Layout Plan drg No. 14009-AEW-2741-F105	22
	Proposed first flr HVAC drg No. 9811 M1012.....	23
	Proposed HVAC Layout 3D.....	24

1 Non-technical summary

It is proposed to convert the former The Woodlands Beefeater restaurant, next door to the Premier Inn, at 217 Wrotham Road, Gravesend, DA11 7LF, to provide a McDonald's restaurant. The former restaurant operated with trading hours of 06:30 to 22:30 hours. The McDonald's restaurant will mirror these hours.

This Plant Noise Impact Assessment, which has been commissioned by McDonald's, accompanies the planning application and assesses the potential noise impacts from fixed plant on the site, setting out mitigation measures where required.

The site is located on the western side of Wrotham Road in Gravesend. A Premier Inn Hotel lies immediately to the west and has residential dwelling to the north and across the road to the east.

The closest sensitive neighbours will be the guests in the Premier Inn, immediately to the west, where the closest guest bedroom window is some 15m from the edge of the flat roof of the restaurant where some of the proposed external HVAC equipment is to be installed. The closest residential neighbours are to the north, some 25m away on Wrotham Road and are considered, in the context of the external plant, to be less-sensitive, than the hotel itself.

It is proposed that the existing external kitchen extract fan, air handling units and multiple condensers are all removed and replaced by new plant consisting of;

- Air handling units and 3 No. associated ASHP's,
- Kitchen & Common extract fans,
- 5 No. ASHP's serving the Freezer, Chiller, Drinks Machine, Crew Room, Door Heater,
- A single internal air handling unit with two external ASHP's,
- Inline toilet extract fan,
- Multiplex & Beverage Cell Crew & Manager's Room, Water Heater, ABS, Chiller, Freezer & Door Heater condensers,
- All mounted on the flat roof over the restaurant.

An on-site sound survey has been carried out over 3 days, to quantify current ambient levels experienced by the immediate neighbours. These can be classified as being "*moderate to high*" by day and "*moderate*" at night due to the proximity to the road network. This existing transport noise will help to mask any plant noise.

The National Planning Policy Framework (NPPF), sets out government's planning policies for England and how these are expected to be applied. The NPPF stipulates developments should not give rise to *significant adverse impacts* from noise, *adverse impacts* should be mitigated and reduced to a minimum, whilst recognising that development will often create some noise.

The Noise Policy Statement for England (NPSE) helps to recognise what are *adverse* and *significant adverse impacts* by how noise can change people's behaviour inside and outside their homes. Development should be avoided if noise from it is likely to be *noticeable and disruptive*, forcing windows to be kept shut and interrupting sleep, for example. Where noise has the potential to be *noticeable and intrusive*, but only causes small changes in behavior, noise must be shown to be *mitigated and reduced to a minimum*. For developments where

noise can be heard but does not cause any changes to behavior *no specific measures are required.*

Gravesham Borough Council's Adopted Core Strategy 2014 refers to noise in Policy CS19: *Development and Design Principles* and states in Section 3. that:

New development will be located, designed and constructed to:

- *avoid adverse environmental impacts from pollution, including noise, air, odour and light pollution, and land contamination; and*

Fixed plant noise can be controlled to be *no greater than the existing background level*, at the closest neighbours and the following mitigation required is;

- Kitchen extract fan to be fitted in an acoustic enclosure with a 2400mm long discharge silencer,
- Both Air handling units S2 to be fitted with fresh air inlet silencers 1200mm long,
- The General Kitchen, Energizer, Toilet & Beverage Cell extract fans to have atmospheric silencer, 900mm long,
- An acoustic screen is required (1800mm high) running along the edge of the flat roof facing the hotel;



Figure 1 acoustic screen

It can therefore be demonstrated that noise from the proposed HVAC plant will be adequately controlled to ensure that both Local and National noise criteria are met.

2 Introduction

2.1 Overview

It is proposed to convert the former The Woodlands Beefeater restaurant, next door to the Premier Inn, at 217 Wrotham Road, Gravesend, DA11 7LF, to provide a McDonald's restaurant. The former restaurant operated with trading hours of 06:30 to 22:30 hours. The McDonald's restaurant will mirror these hours.

This Plant Noise Impact Assessment, which has been commissioned by McDonald's, accompanies the planning application and assesses the potential noise impacts from fixed plant on the site, setting out mitigation measures where required.

2.2 Objectives

To monitor existing sound levels closest to the neighbours and assess the likely mitigation that will be required to prevent any adverse impacts on the neighbours from the noise generated by this proposed development.

The restaurant will require mechanical services equipment to ventilate and keep them warm in winter and cool in summer. This equipment will be located externally on the flat roof. Noise from this equipment will be assessed and suitable mitigation detailed to ensure its operation will not disturb the neighbours.

This report will set out a summary of the necessary mitigation measures that will be required to ensure compliance with local and National planning policy.

3 Planning Policy

3.1 Gravesham Borough Council

Gravesham Borough Council's Adopted Core Strategy 2014 refers to noise in Policy CS19: *Development and Design Principles* and states in Section 3. that:

New development will be located, designed and constructed to:

- *avoid adverse environmental impacts from pollution, including noise, air, odour and light pollution, and land contamination;*

3.2 National Planning Policy Framework (NPPF)

The NPPF¹ sets out governmental planning policy for England. The NPPF states that, with respect to noise, planning policies and decisions should aim to;

- avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;

¹ Revised December 2024

- mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new developments, including through the use of conditions;
- recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- identify and protect areas of tranquility which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.

The Framework also states that consideration should be given to the Noise Policy Statement for England².

3.3 Noise Policy Statement for England (NPSE)

The NPSE aims to “Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development” and has three aims;

- Avoid significant adverse impacts on health and quality of life from environmental, neighbor and neighborhood noise within the context of Government policy on sustainable development
- Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbor and neighborhood noise within the context of Government policy on sustainable development
- Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour and neighborhood noise within the context of Government policy on sustainable development.

NPSE shares the definitions from existing guidance. The WHO – Guidelines for Community Noise (2009), introduced the concepts of NOEL/LOAEL, where;

NOEL No Observed Effect Level

This is the level below which no effect can be detected. In simple terms, below this level there is no detectable effect on health and quality of life due to the noise.

LOAEL Lowest Observed Adverse Effect Level

This is the level above which adverse effects on health and quality of life can be detected.

SOAEL Significant Observed Adverse Effect Level

This is the level above which significant adverse effects on health and quality of life

² NPSE published by DEFRA March 2010

occur.

The Noise Policy Statement considers that noise levels above the SOAEL would be seen to have, by definition, significant adverse effects and would be considered unacceptable. Where the assessed noise levels fall between the LOAEL and the SOAEL noise levels, the Policy Statement requires that:

"all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development... .. This does not mean that such adverse effects cannot occur."

Where noise levels are below the LOAEL it is considered there will be no adverse effect. Once noise levels are below the NOEL there will be no observable change. No objective values are offered within the NPSE, as the document does indicate that each site should be considered on its own merits.

3.4 Planning Practice Guidance (PPG)

Further guidance was published by Department for Communities & Local Government in March 2014 relating to Noise and is known as Planning Practice Guidance (PPG) and requires Local planning authorities' plan-making and decision taking should take account of the acoustic environment and in doing so consider:

- whether or not a significant adverse effect is occurring or likely to occur;
- whether or not an adverse effect is occurring or likely to occur; and
- whether or not a good standard of amenity can be achieved.

Noise is rated within this guidance in terms of its "Observed Effect Level" and provides the following table giving examples;

Perception	Examples of Outcomes	Increasing Effect Level	Action
No Observed Effect Level (NOEL)			
Not noticeable	No effect	No Observed Effect	No specific measures required
Noticeable and not intrusive	Noise can be heard but does not cause any changes in behaviour or attitude. Can slightly effect the acoustic character of the area but not such that there is a perceived change in quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level (LOAEL)			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level (SOAEL)			
Noticeable and	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities	Significant Observed Adverse Effect	Avoid

disruptive	during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic		
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an ability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep depreciation/awakening: loss of appetite. Significant. Medically definable harm, e.g. auditory and non-auditory	Unacceptable Adverse Effect	Prevent

Table 1 PPG Observed Effect Levels

3.5 BS7445 Description and measurement of environmental noise

BS7445-2:1991 (*description and measurement of environmental noise – Part 2: Guide to the acquisition of data pertinent to land use*) describes methods for the acquisition of data which provide descriptors that enable;

- a description of the environmental noise in a specified area of land to be made in a uniform way;
- the compatibility of any land use activity or projected activity to be assessed with respect to existing or predicted noise.

The requirements of this Standard will be used to ensure consistency in sound measurements and their interpretation.

3.6 BS4142 Method for rating and assessing industrial and commercial sound

BS4142:2015+A:2019 provides a method for assessing the likely impact industrial and commercial noise will have on residential neighbour that depends on the margin by which the Rating Level of the specific sound exceeds the back ground sound and the context in which the sound occurs.

The table below details the likely impact based on the excess of the background;

Difference between background sound and Rating Level	BS4142 Assessment
+10 dB	Indication of a significant adverse impact
+ 5 dB	Indication of an adverse impact
0 dB	Indication of low impact

Table 2 BS4142 impacts

BS4142 requires that character penalties, if any tonality, intermittency, impulsivity or “other characteristics” are present in the noise are added to the assessed $L_{Aeq,T}$ level of plant noise to provide a Rating Level ($L_{A,Tr}$).

The table below summarizes acoustic feature penalties;

Acoustic Feature	Correction dB		
	Just perceptible	Clearly perceptible	Highly perceptible
Tonality	2	4	6
Impulsivity	3	6	9
Intermittency		3	
Other characteristics		3	

Table 3 acoustic feature penalties

These penalties are additive, however the combine correction, for a clearly audible source would not be expected to be greater than 10 dB. Where the source is no louder than the background and has no readily perceptible features the Rating Level is often equal to the $L_{Aeq,T}$ level.

3.7 IEMA Guidelines for Environmental Noise Impact Assessment

The Institute of Environmental Management & Assessment (IEMA) has published its *Guideline for environmental Noise Impact Assessment*³, which addresses the key principles for noise impact assessments and provides guidance for assessing the impact of noise.

The IEMA guidance recognizes that each situation is unique and care should be taken when applying quantitative criteria that the context of the site, its environs and the nature the noise sources to be assessed are considered.

The table below sets out effect levels for changes in sound level (L_{Aeq}) for receptors of great and some sensitivity. However, these only apply to sources with broadly similar characteristics;

Category	Changes in sound level L_{Aeq} at receptor of great sensitivity
Very substantial	+10 dB
Substantial	+5 dB
Moderate	+3 to 5 dB
Slight	+3 to 5 dB (receptor of some sensitivity)
None/Not Significant	<3 dB

Table 4 Effect descriptors

In assessing the impact of noise created by the proposed development the increase in average noise level can be used to classify the likely impact, as shown the table below;

Changes in sound level	Category
0 dB	No impact
+3 dB	Just perceivable
+5 dB	Noticeable
+10 dB	Twice as loud

Table 5 showing perceptions to change in sound levels

³ Iema Guideline for Environmental Noise Impact Assessment version 1.2 (November 2014)

An example of how the impact arising from a change in sound levels could be evaluated is presented in the table below⁴.

Long-term Impact Classification	Short-term Impact Classification	Sound level change dB L_{pAeqT} (positive or negative) T = either 16hr day or 8hr night
Negligible	Negligible	≥ 0 dB and < 1 dB
	Minor	≥ 1 dB and < 3 dB
Minor	Moderate	≥ 3 dB and < 5 dB
Moderate	Major	≥ 5 dB and < 10 dB
Major		≥ 10 dB

Table 6 showing relative significance in change in sound levels

From this it can be seen that for changes in, traffic noise for example, in the long term of less than 3 dB can be considered to have a *negligible impact*.

3.8 Noise Criteria for on-site activity

The table below sets out the appropriate Standards by which each element of noise from the proposed development should be assessed by;

Noise Element	Assessment Standards	Criteria
Fixed plant	BS4142	<i>Rated level</i> no greater than background sound level at NSRs

Table 7 showing assessment criteria

4 Description potential noise impacts

The application, under consideration here, is to convert the former The Woodlands Beefeater restaurant to a new McDonald's.

The closest sensitive neighbours will be the guests in the Premier Inn, immediately to the west, where the closest guest bedroom window is some 15m from edge of the flat roof of the restaurant where some of the external plant is to be mounted. The closest residential neighbours are more than 25m away, in the context of the external plant, to be less-sensitive.

The key noise impacts that this application raised are;

- Noise from external plant required to ventilate and condition the buildings as well as provide cooling for any food storage.

The closest sensitive receivers are hotel bedrooms the closest of which is some 15m from the site.

⁴ Source HS2 Phase 1 Environmental Statement

6 Sound Measurements

A logging sound level meter (SLM) was set up with a microphone on a boom 2.2m high, close to the eastern boundary overlooking Wrotham Road.

The photograph below shows the monitoring equipment;



Figure 3 photograph of monitoring equipment

The aerial view below shows the adjacent land uses, the hotel as well as the location of the sound logging meter;



Figure 4 aerial view and SLM

The sound meter/pre-amp/microphone was calibrated using a hand held calibrator before and after the survey which ran from Thursday 15th January 2026 for 3 days, with no adverse variants being observed.

Details of the equipment used are given in the table below.

Meter Make	Model	Serial No.	Calibration Date	Calibration Certificate No.	Calibration due date
Rion	NL52	00142661	21-3-24	1159720	21-1-26
Rion	NC74	34794316	17-6-25	1182560	17-6-26

Table 8 showing measurement equipment details

The weather during the survey was fine with light winds and generally suitable for repeatable environmental sound measurement⁵.

⁵ <https://www.timeanddate.com/weather/@12265368/historic>

6.1 Sound measurements

The chart below shows the L_{A90} background sound levels recorded;

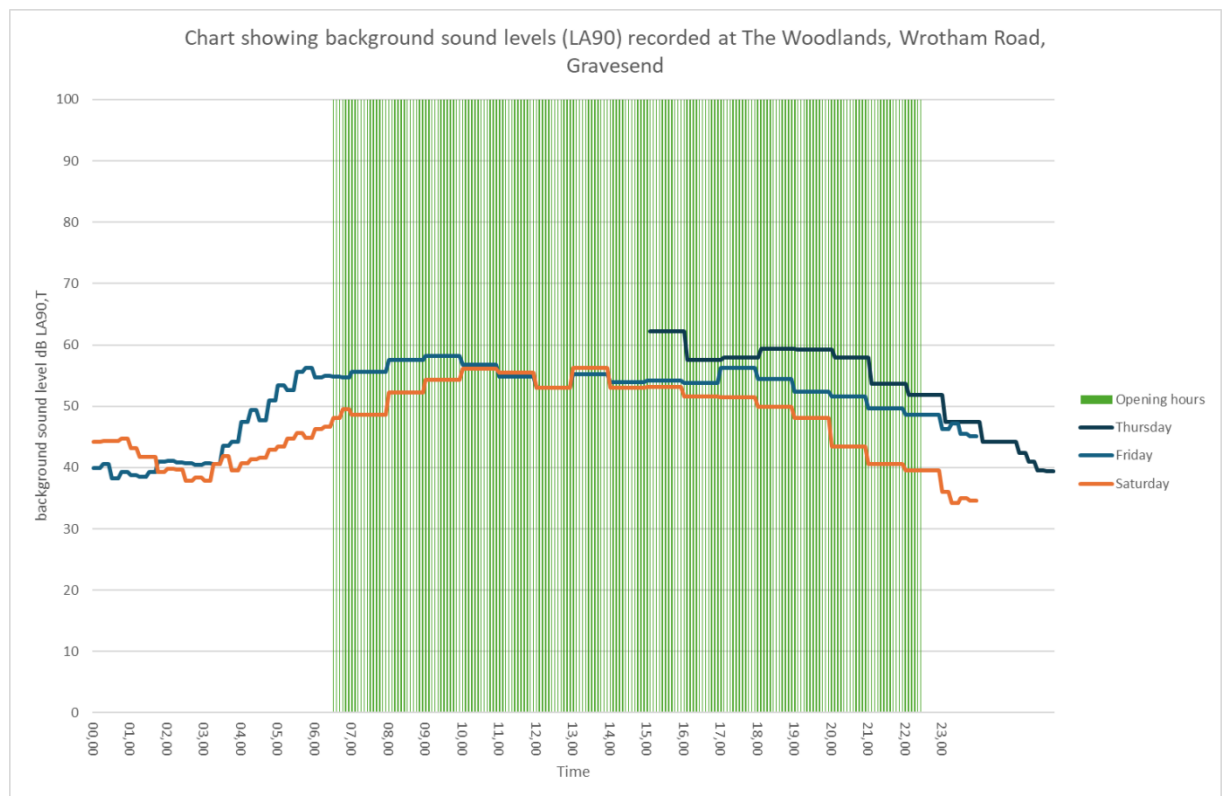


Figure 5 showing recorded L_{A90} levels

Figure 5 showing the L_{A90} levels in the mid 50's dB during the day, dropping back to 40 dB in the last hour of trading up to 10:30pm. Overnight, when just the Freezer and Chiller condensers are running the background was no lower than 34 dB $L_{A90,15\text{minute}}$.

7 Fixed Plant Noise

7.1 Mechanical services plant

The new plant will be located on the flat roof section of the restaurant building and the mansard roof element will screen the view of the plant from the ground. The typical layout of the plant is shown on CDM's drawing No. 9811 M1011 a copy is provided at the rear of this report.

The plant will consist of the kitchen extract fan E1, the kitchen supply air handling unit S1 (with three associated condenser units), the restaurant air handling units S2 (with its two associated condenser units), an ABS drinks machine cooler, a further three condenser units serving the manager's office, staff room and the door air curtain, plus a Chiller and a Freezer Condenser. There is also a small ASHP on the side of the Hot Water System (HWS) as well as Back of House (BOH) extract fan.

The table below details the equipment to be used;

Item	Make/model	Units	Sound levels								
			dBA	63Hz dB	125Hz dB	250Hz dB	500Hz dB	1KHz dB	2KHz dB	4KHz dB	8KHz dB
S1 kitchen AHU	Weatherite IL200	Lw	80	83	83	82	76	72	70	67	72
S1/C1 condenser	PUZ-ZM250YKA	LpA at 1m	62	71	62	61	60	57	53	49	43
S1/C2 condenser	PUZ-ZM250YKA	LpA at 1m	62	71	62	61	60	57	53	49	43
S1/C3 condenser	PUZ-ZM200YKA	LpA at 1m	60	67	60	58	59	54	50	46	41
ABS drinks cooler	Manitowoc CVD1200A	Lw	74	63	72	71	70	69	66	65	62
S2 lobby AHU	Weatherite IL150	Lw	73	77	77	75	71	67	64	61	61
S2/C1 condenser	PUZ-ZM250YKA	LpA at 1m	77	87	78	76	75	72	68	64	58
S2/C2 condenser	PUZ-ZM250YKA	LpA at 1m	77	87	78	76	75	72	68	64	58
E1 kitchen extract fan	W&W BCW385/100-96	Lw 2.0m3/s @1200Pa	97	101	98	97	97	89	85	83	79
	discharge silencer 1.2m long	DIL		3	11	20	36	39	31	21	15
E2 wc extract	Systemair K315M EC		73	77	79	68	67	67	66	61	60
E3 kit gen ext	Helios GBW 500	Lw 1.5 m3/s	61		68	62	60	54	51	48	45
E4 Bev Cell ext	Helios GBW 500	Lw 0.8 m3/s	57		64	58	56	50	47	44	41
Coldroom Condenser	JEHS-0200-B2-M-1	LpA at 10m	33								
Freezer Condenser	JEHS-0500 B2-M-3	LpA at 10m	38								
DH1/C1 Door condenser	Mitsubishi PUZ 71VHA	LpA at 1m	59	62	61	63	55	54	48	44	36
AC1/C1 Office	Mitsubishi SUZ M35VA	LpA at 1m	51	63	56	50	49	45	42	38	36
AC2/C1 Crew Room	Mitsubishi SUZ M35VA	LpA at 1m	51	63	56	50	49	45	42	38	36
ASHP/C1	Adveco Fpi-32-9	LpA at 1m	51	60	58	49	46	46	43	38	39

Table 9 plant details

The kitchen extract fans and air handling units & condensers will run continuously, although each item of plant is inverter (or speed) controlled and will only work as hard as required. The speed of each will be controlled by the thermal load, the condensers will cycle on and off as required.

It is proposed that the restaurant will be open from 6:30am to 22:20 hours, as a maximum.

7.2 Plant mitigation & noise levels

The level of sound created by all the plant running at full duty simultaneously as well as for typical night time operation⁶ has been calculated using iNoise implementing the requirements of ISO9613 Part 2⁷ and assuming the following mitigations are installed;

- Kitchen extract fan to be fitted with a 2400mm long discharge silencer & acoustic enclosure,
- Both Air handling unit to be fitted with fresh air inlet silencers 1200mm long,
- The General Kitchen, Toilet, Energizer & Beverage Cell extract fans to be fitted with atmospheric silencers, 900mm long,
- Acoustic screen to be installed along the western roof edge as shown below.



Figure 6 location of required acoustic screen

⁶ Details of typical time night plant operation are shown in Appendix 1

⁷ ISO 9613-2:1996 (Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation) including ISO/TR 17534-3:2015 (Acoustics - Software for the calculation of sound outdoors - Part 3: Recommendations for quality assured implementation of ISO 9613-2 in software according to ISO 17534-1).

The table below details the sound reduction performances required for the plant noise mitigation measures;

Noise Control Item	Dynamic insertion loss required dB					
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
kit ext discharge silencer 900 x 900 x 2400mm long	15	22	45	45	32	25
Kitchen extract fan ac' enclosure D _w	22	32	32	38	45	43
AHU S1 & S2 FAI silencer 950x800x1200mm long	7	14	24	26	24	16
General extract silencer 450id, 900mm long podded	11	20	36	39	31	21
Toilet Extract silencer 315id, 900mm long no pod	7	14	24	26	24	16
Energizer Extract silencer 450id, 900mm long podded	11	20	36	39	31	21
Beverage Cell ext' silencer 355id, 900mm long podded	11	20	36	39	31	21
50mm acoustic panel screen 1.8m (in lab' SRL)	22	32	38	45		

Table 10 sound reduction requirements

The image below shows the restaurant building with the roof plant identified by red crosses;



Figure 7 plan showing roof plant locations

The image below is taken from modelling software and shows a 3D image of the site and the neighbours, Premier Inn;

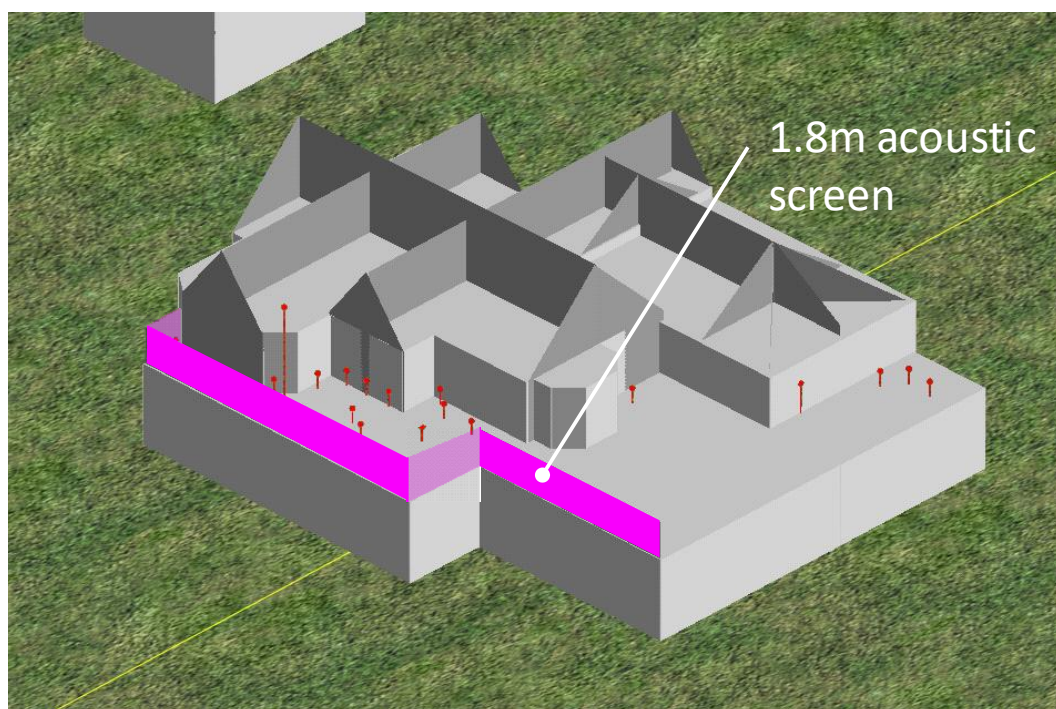


Figure 8 3D image showing plant & receiver locations

The table below shows the predicted plant sound levels at the neighbours⁸;

Description	Plant Noise Levels	
	Day time at 1.5m dB L _{Aeq}	Night time at 4.5m dB L _{Aeq}
1 Lynton Court	27	14
136 Wrotham Rd	36	22
138 Wrotham Rd	36	22
140 Wrotham Rd	35	21
142 Wrotham Rd	35	22
215 Wrotham Rd	23	11
4 Lynton Court	27	14
Premier Inn	36	22

Table 11 showing predicted mitigated plant noise

This shows that the highest predicted day and night plant noise levels will be outside the first floor windows of the closest bedroom on the 1st floor of Premier Inn, but will be no higher than 36 dB L_{Aeq} day and 22 dB L_{Aeq} by night, both less than the background sound levels.

A BS4142 assessment of these levels is provided later in this report.

⁸ Details of full calculations can be made available upon request

8 Assessment of impacts

8.1 BS4142 assessment of impact of plant noise

BS4142:2015+A:2019 provides a method for assessing the likely impact industrial and commercial noise will have on residential neighbours. This Standard requires that *character penalties*, if any tonality, intermittency, impulsivity or “other characteristics” are present in the noise are added to the assessed $L_{Aeq,T}$ level of plant noise to provide a Rating Level.

Here the plant will run without any tonality or discernable intermittency or impulsivity and at a level more than 10 dB below the day time background sound level and therefore will not attract any characteristic penalties. However, at night, some of the plant will run intermittently and this might be perceivable at times when the background sound level is considerably lower. Consequently, a 3 dB penalty needs to be added to the assessed $L_{Aeq,T}$ to give the Rating Level.

The table below shows the BS4142 assessment of plant noise:

Location	Premier Inn	
	Day time	night time
Predicted plant noise level dB L_{Aeq}	36	22
character penalties		
tonality	0	0
impulsivity	0	0
intermittency	0	0
other characteristics	3	3
Plant Rating Level dB $L_{Ar,T}$	39	25
Background sound level (up to 11pm & overnight) dB L_{A90}	40	34
Excess over background dB	-1	-9
Likely impact	low	Very low

Table 12 BS4142 assessment of plant noise

This shows that plant noise will have a “low” impact during the day and “very low” at night, therefore complies with local and National policy aims.

8.2 Summary of Impact Assessment

The table below summarises these noise criteria for each element of the assessment;

Noise Element	Requirement		Sound levels	Complies
	Criteria	Comment		
Fixed plant	No greater than background		Existing background 40 dB $L_{A90,Day}$ & 34 dB $L_{A90,Night}$ Predicted plant levels 39 dB $L_{A,r (Day)}$ & 34 dB $L_{Ar(Night)}$	✓ HVAC mitigation req'd

Table 13 summary of criteria & predicted sound levels

This shows that this development meets both local and National planning policy objectives for noise.

9 Uncertainty effects on assessment conclusions

There is a degree of uncertainty at each stage of these assessments, most will be small and not all additive, but if the uncertainty was large and the assessment conclusion was on the threshold of acceptability, then it might change the assessment outcome.

9.1 Residential neighbours existing sound climate

The magnitude of the impact of fixed plant and customer vehicle noise on the neighbours has been based on the results of an on-site ambient noise survey, where levels were monitored in a location representative of that experienced by the neighbours.

Any on-site sound survey will only provide a snap shot of historical levels. For these levels to provide the basis upon which future impacts can be assessed, then the snap shot should, at the very least, cover the hours under assessment and during normal circumstances. Measuring next to a road which has temporary traffic lights in place may well understate sound levels when the traffic is passing freely, for example, should be avoided.

Here the survey was conducted over 3 days, during clement weather conditions. The background sound levels dropped as low as 34 dB $L_{A90,T}$ in the small hours, a level which is comparatively low given the proximity to the major road network.

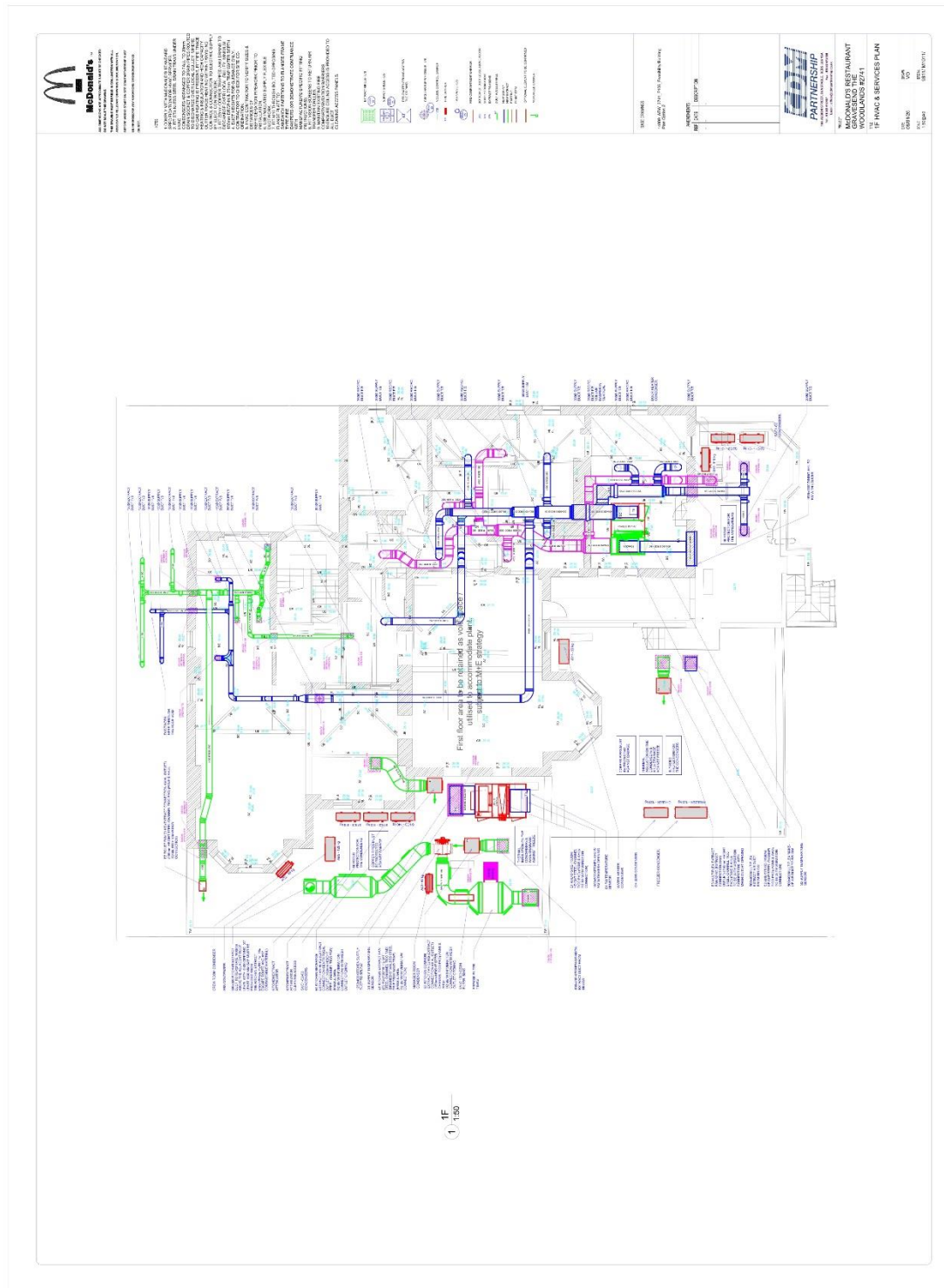
9.2 Assessment of plant noise

The maximum noise that all the plant running at 100% duty will create here, has been compared with the minimum representative day time background sound levels, and a sensible degree of diversity has been included for the operation of the plant at night. Practically at 3am in the morning, when the background is at its quietest, the plant will be off. First thing in the morning and last at night when the restaurant will be at its quietest, all the plant will not be running flat out. The air-conditioning fans and condensers will be ticking over and even the main kitchen extract fan will automatically reduce in speed when there will be just a few orders being cooked.

The mitigation requirements set out in this report are therefore robust and will not be adversely effected by uncertainty.

[illegible]

Proposed first flr HVAC drg No. 9811 M1012



Proposed HVAC Layout 3D

