

Environmental Noise Assessment

McDonalds, Owl Lane, Dewsbury



On Behalf of



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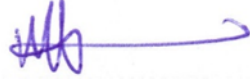
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Project Name: McDonalds, Owl Lane, Dewsbury

Project Ref: 7281 Dewsbury

Report Title: Environmental Noise Assessment

Date: 5th February 2020

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Revision	Date	Description
1	7-1-20	Floor area of NG140 revised to 403 m ²
2	10-9-20	Freezer & ABS Condensers added in with mitigation

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1 Executive Summary

McDonald's propose to develop a vacant plot at Owl Lane, Shaw Cross, Dewsbury which currently has outline consent for the erection of a building with restaurant and function room and two hot food retail units with a combined floor area of 1800 m². McDonald's proposal is for a single free standing restaurant building with drive-thru facility but far smaller in scale with only 403 m² floor area.

The existing consent has two Conditions No. 12 requiring details of the physical measures to protect the neighbours from noise and Condition No. 13 requiring noise to be adequately controlled from any fixed plant.

Two noise reports were submitted with the planning application by S & D Garritt Ltd (acoustic consultants) providing the details for the physical noise measures, namely a 4.6m high acoustic screen running along the part of the eastern boundary backing on to the houses on Owl Lane and commitment to limit any fixed plant noise to 5 dB below the background sound level.

McDonald's has appointed Acoustic Associates SW Ltd to consider if the consented 4.6m high acoustic screen is a sufficient physical measure to control noise from the drive-thru lane/car park and provide the details of their fixed plant and the required mitigation to ensure its noise is limited to background – 5 dB.

This report demonstrates that the consented acoustic screen, running along the eastern boundary at a height of 4.6m will be more than sufficient to adequately control any adverse impacts on neighbours from McDonald's proposals.

2 Introduction

2.1 Overview

Outline Planning permission has been granted by Kirklees Council for the erection of a restaurant and hot food outlets covering 1565m² for A3 and 235 m² for A5 use on the vacant plot, at Owl Lane, Shaw Cross, Dewsbury (Application Number: 2016/60/92953/E). McDonald's are now seeking to develop this site with a considerably smaller restaurant building 403 m² with a drive thru lane.

The existing outline permission includes various Conditions two of which referred to noise, namely;

12. Prior to development commencing a report by a suitably qualified person shall be submitted to an approved in writing detailing the physical measures to be taken within the new building, to protect the neighbouring dwellings from noise generated by the development. The agreed measures shall be implemented and subsequently maintained for the lifetime of the development.

Reason: In the interests of the residential amenities of the neighbouring dwellings and to accord with Policy EP6 of the Kirklees Unitary Development Plan.

13. The use hereby permitted shall not commence until details of the installation and / or erection of any extract ventilation system, including details of methods of treatment of emissions and filters to remove odours and control noise emissions have been submitted to and approved in writing by the Local Planning Authority. The approved works shall be installed and thereafter retained, and operated at all times that the takeaways / restaurant are in use, and maintained in accordance with manufacturers instructions.

Reason: To protect the residential amenities of neighbouring properties in accordance with the guidance contained in part 8 of the National Planning Policy Framework "Promoting Healthy Communities".

McDonald's proposed development is for a single restaurant building, an order of magnitude smaller than the permitted development, a far less intensive use of the site and therefore will have a lesser impact on the neighbours.

2.2 Objectives

McDonald's proposal includes a drive thru lane, that was not part of the permitted development and the potential impact will need to be considered, to determine if the consented physical mitigation measures will be sufficient to ensure there will be no adverse impact on the neighbours.

Noise from the fixed plant on the roof of the restaurant will also need to be considered and suitable mitigation set out to ensure plant noise is adequately controlled.

This reports also sets out the details of the previously approved noise control scheme which included acoustic fences.

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.

Customers vehicles using the drive thru lane, making their orders at the Customer Order Displays will inevitably make some noise that could impact on the neighbours, these sources will be individually and collectively assessed within this report.

The restaurant requires mechanical services equipment to ventilate the kitchen and keep the building warm in the winter and cool in the summer. This equipment will be located on the 1st floor roof of the single storey restaurant building. Noise from this equipment will also be looked at and suitable mitigation detailed to ensure it does 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 National Planning Policy

National Planning Policy Framework (NPPF¹) provides noise policy aims within Section 15 “Conserving and enhancing the natural environment” and paragraph 170 states;

170. Planning policies and decisions should contribute to and enhance the natural and local environment by:

- a) protecting and enhancing valued landscapes, sites of biodiversity or geological value and soils (in a manner commensurate with their statutory status or identified quality in the development plan);*
- b) recognising the intrinsic character and beauty of the countryside, and the wider benefits from natural capital and ecosystem services – including the economic and other benefits of the best and most versatile agricultural land, and of trees and woodland;*
- c) maintaining the character of the undeveloped coast, while improving public access to it where appropriate;*
- d) minimising impacts on and providing net gains for biodiversity, including by establishing coherent ecological networks that are more resilient to current and future pressures;*
- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air*

¹ Revised 19th February 2019

- and water quality, taking into account relevant information such as river basin management plans; and*
- f) *remediating and mitigating despoiled, degraded, derelict, contaminated and unstable land, where appropriate.*

Paragraph 180 also refers to noise and states;

180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:

- a) *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life;*
- b) *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason; and*
- c) *limit the impact of light pollution from artificial light on local amenity, intrinsically dark landscapes and nature conservation.*

The Framework states that the planning system should contribute to and enhance the natural and local environment by preventing both new and existing development from contributing to or being put at unacceptable risk from, or being adversely affected by unacceptable levels of noise pollution. It does not, however, provide any specific formal guidelines.

Further guidance was published by Department for Communities & Local Government in March 2014 relating to Noise and is known as Planning Practice Guidance, this states.

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.*

In line with the Explanatory Note of the Noise Policy Statement for England, this would include identifying whether the overall effect of the noise exposure (including the impact during the construction phase wherever applicable) is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation. As noise is a complex technical issue, it may be appropriate to seek experienced specialist assistance when applying this policy.

Significant Observed Adverse Effect Level (SOAEL) occurs above the perception of “noticeable and intrusive” and examples of this are given in the table below, which has been taken directly from Paragraph 006 of PPG;

Perception	Examples of Outcomes	Increasing Effect Level	Action
		Lowest Observed Adverse Effect Level	
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	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. avoiding certain activities 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	Significant Observed Adverse Effect	Avoid

NPSE states;

“Promote good health and good quality of life”

2.15 This statement expresses the long term desired policy outcome, but in the use of “promote” and “good” recognizes that it is not possible to have a single objective noise-based measure that is mandatory and applicable to all sources of noise in all situations.

“Effective management of noise”

2.16 This concept confirms that the policy applies to all types of “noise” (environmental, neighbour and neighbourhood) and that the solution could be more than simply minimising the noise.

“Within the context of Government policy on sustainable development”

2.17 Sustainable development is a core principle underpinning all government policy. For the UK Government the goal of sustainable development is being pursued in an integrated way through a sustainable, innovative and productive economy that delivers high levels of employment and a just society that promotes social inclusion, sustainable communities and personal wellbeing. The goal is pursued in ways that protect and enhance the physical and natural environment, and that use resources and energy as efficiently as possible.

2.18 There is a need to integrate consideration of the economic and social benefit of the activity or policy under examination with proper consideration of the adverse environmental effects, including the impact of noise on health and quality of life. This should avoid noise being treated in isolation in any particular situation, i.e. not focusing solely on the noise impact without taking into account other related factors.

The document "Noise Policy Statement for England" referenced within the NPPF sets out the following vision for on-going noise policy:

"Promote good health and quality of life through the effective management of noise within the context of Government policy on sustainable development."

This vision should be achieved through the following Noise Policy Aims:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development: avoid significant adverse impacts on health and quality of life; mitigate and minimise adverse impacts on health and quality of life; and where possible, contribute to the improvement of health and quality of life".

To achieve these objectives, the Noise Policy Statement sets out three noise levels to be defined by the assessor:

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 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.

3.2 Local Planning Policy

Kirklees Council published in February 2013 GUIDANCE ON NOISE, ODOUR AND AIR QUALITY CONTROL FOR RESIDENTIAL DEVELOPMENT IN THE TOWN CENTRES, the noise section of which states;

The town centre currently comprises mainly commercial and leisure uses, shops, pubs/bars, nightclubs and office space. The centre is surrounded by a highly trafficked ring road and a number of major thoroughfares through the centre itself. Very often these commercial and leisure uses can generate high levels of noise, for example, entertainment noise, the operation of air handling, air conditioning plant and kitchen extraction systems as well as noise from street activity associated with the night time economy. Roads also provide a significant source of noise. Such noise can be a problem to the occupants of inappropriately sited or inadequately protected residential development close to existing commercial and leisure uses. Exposure to excessive noise levels is recognised both nationally and internationally as a source of ill health.

Applications for proposed residential development in locations close to such existing sources of noise will need to be accompanied by a noise report that examines if noise could be a problem to future occupants and if so what additional measures are required to protect them. This may include a ventilation scheme if windows need to remain closed due to elevated noise levels. Companies providing such reports can be found at the Association of Noise Consultants - <http://www.association-of-noiseconsultants.co.uk/Member/List> or the Institute of Acoustics - <http://www.ioa.org.uk/find-a-specialist/>

3.3 Numerical criteria for fixed plant noise

Guidance as to a numerical definition of LOAEL may be inferred from the following British Standards 4142: 2014 (Method for rating and assessing industrial and commercial sound), by comparing the level of, in this case plant noise, (rated level) with the background. If the rated level of plant noise is less than 5 dB above the background, then this can be deemed less than an adverse impact and where the rated level is less than the background any impact will be low. Setting the plant noise criteria at 5 dB below the background² therefore provides robust protection to the amenity of the neighbours.

² With a backstop of no lower than 35 dB $L_{A,r}$ which will ensure internal levels no higher than 20-25 dB $L_{A,r}$ which according to BS4142 provides satisfactory absolute levels

3.4 Numerical Criteria for customer vehicle noise

The Institute of Environmental Management & Assessment has published Guidelines for Environmental Noise Impact Assessment³, although not ratified by the Institute of Acoustics, does provide some numerical guidance for assessing the impact of change in sound levels, as shown below;

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

From this it can be seen that in the long term, an increase in sound levels of less than 3 dB can be considered to have a negligible impact.

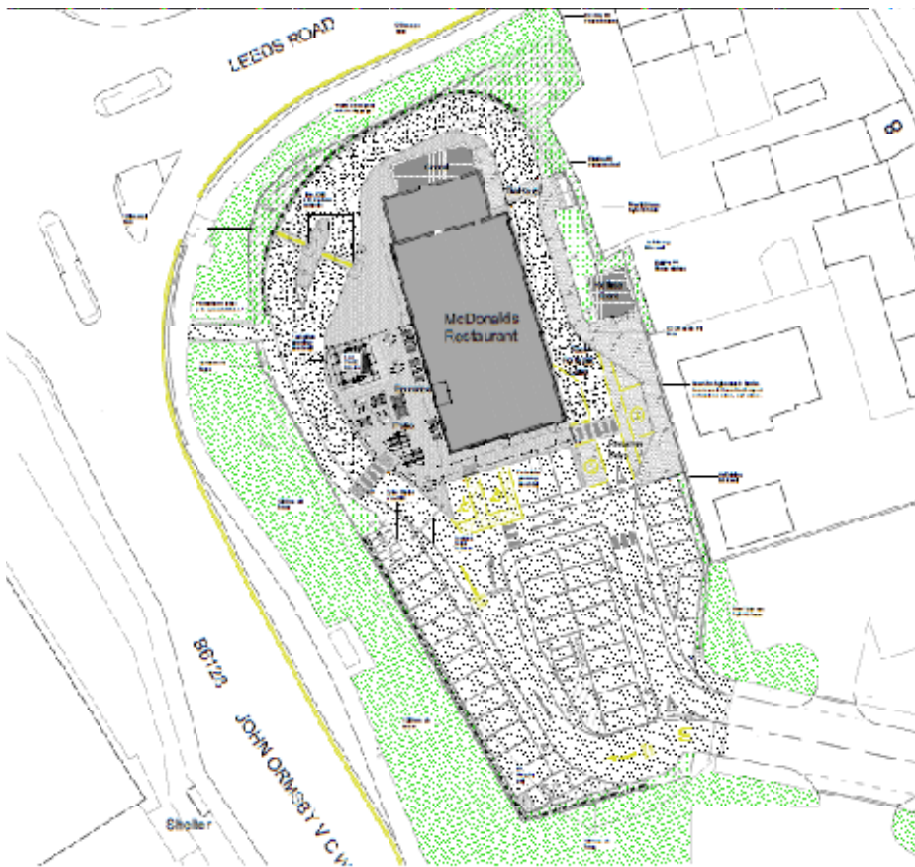
4 Neighbourhood

Mr Peter Ashford BSc, MIOA, ANC (Managing Director of Acoustic Associates SW Ltd) attended site during the afternoon of Wednesday 27th November 2019 and walked the boundary of the site and noted that;

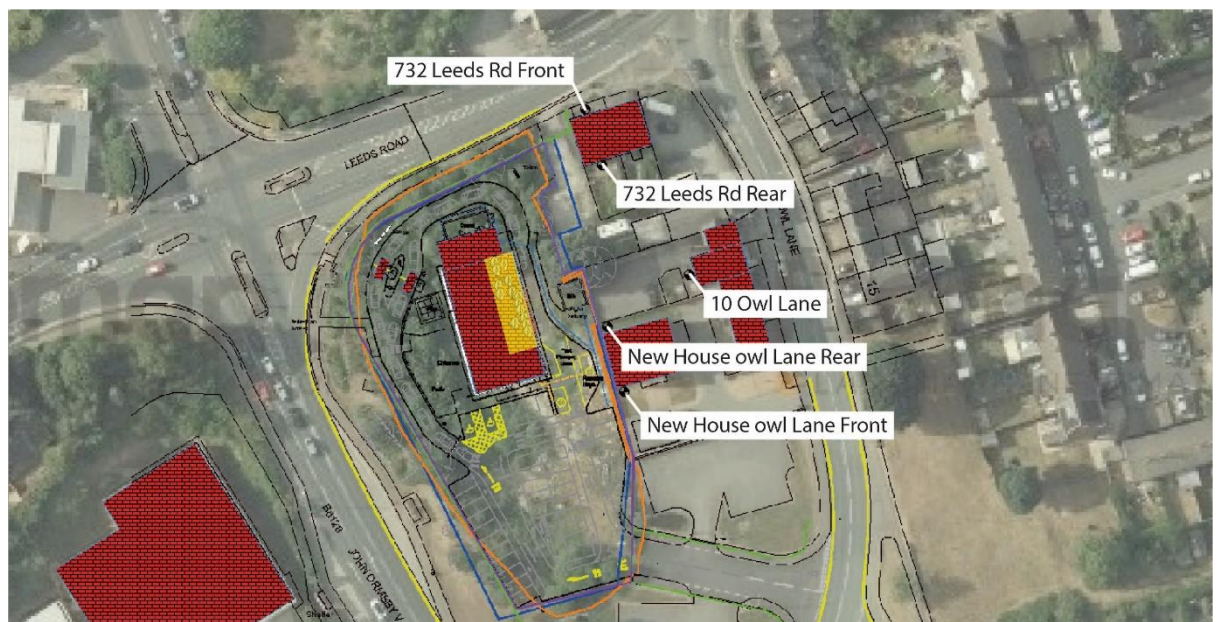
- The site is located at the busy Shaw Cross junction and is bound by Leeds Road to the north, John Ormsby VC Way to the east and the Shell Petrol Station, to the south is a commercial building used by a firm of accountants, the western boundary looks at the rear windows of the houses on Owl Lane. The closest being a reasonably newly built pair at 18A Owl Lane, whose gable end wall is tight to the site boundary.
- Traffic noise dominates the sound scape across the site and particularly along the residential western boundary.

The proposed layout of the site is shown on Scurr Architect's drawing No. 7866-SA-8587-P004B an extract of which is shown over page as well as at the rear of this report.

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



The aerial view below shows the site in context with the locality;



5 Sound Measurements

Whilst on site a sound level meter was set up close to the eastern boundary as shown in photograph below;



The sound meter/pre-amp/microphone were calibrated using a hand held calibrator before and after my survey which ran from 5pm on Wednesday 27th November 2019 to 9am the following morning, with no adverse variants being observed.

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

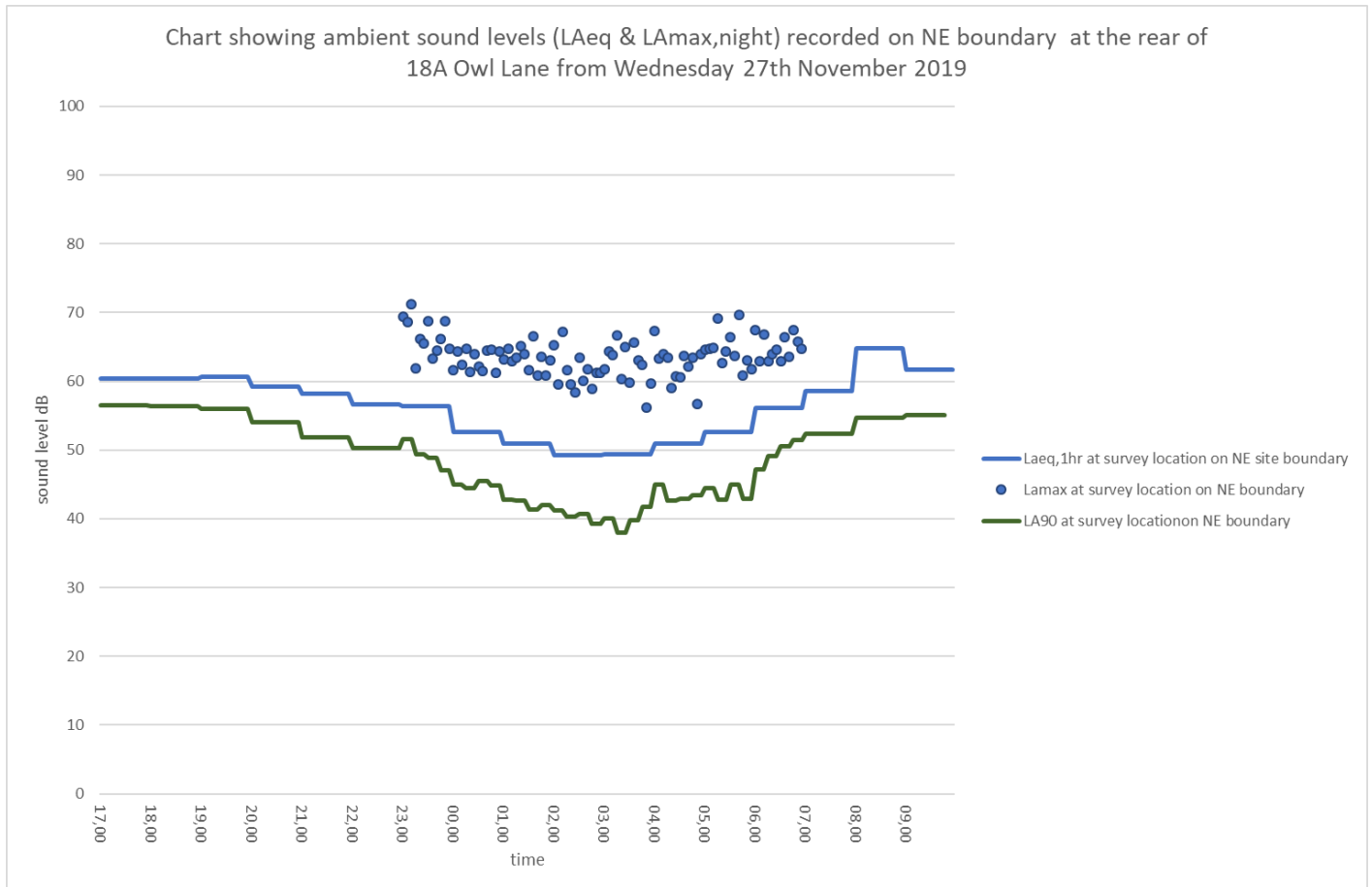
Meter Make	Model	Serial No.	Calibration Date	Calibration Certificate No.	Calibration due date
Rion	NL31	012730381	15-3-18	TCRT18/1219	15-3-20
Rion	NC74	34794316	09-4-19	TCRT19/1277	09-4-20

The weather during the survey was wintery with short spells of fine rain during the evening and light southerly winds⁴ and generally suitable for repeatable environmental sound measurement.

⁴ <https://www.timeanddate.com/weather/@2651286/historic?month=11&year=2018>

5.1 Sound measurements (L_{Amax} , L_{Aeq} + L_{A90})

The chart below shows the L_{Aeq} and L_{A90} values recorded at the survey location;



The L_{Aeq} levels (the indices usually used to describe traffic noise) hovers around and above the 60 dB mark during the day and drops by only 10 dB overnight and provides an indication, although traffic overnight is lighter than during the day, the roads are still being well used. The background sound levels, usually described by the indices L_{A90} (the level exceeded for 90% of the time) are some 5 dB lower during the day and 10 dB less overnight when it bottoms out at 40 dB $L_{A90,15minute}$.

The highest L_{Amax} values recorded in each 5 minute measurement, during the night (11pm to 7am) are represented by the dark blue dots and they are generally somewhere between 60 and 70 dB.

These figures will be used to assess the impacts of the drive thru lane and set the fixed plant noise criteria.

5.2 Comparison with S & D Garrett Ltd's measurement from 2016

The existing consent for the development of this site has been supported by S & D Garritt Ltd's acoustic report⁵ containing reference to measurements carried out on the site in October 2016.

The location of the measurements is not exactly clear from their report but ranged from 48 to 54 dB L_{Aeq} at midnight inline with 53 dB L_{Aeq} recorded in November 2019, as is the background which in 2016 ranged from 40 to 48 dB L_{A90} and is now recorded at 44 dB L_{A90} .

6 Noise Criteria

6.1 L_{Aeq} (used to assess McDonald customer's vehicle noise)

The chart at 5.1 shows the hour by hour existing L_{Aeq} levels at the nearest neighbours (blue line) and provided the activity noise does not exceed these hourly levels by more than 3 dB, according to the Institute of Environmental Management & Assessment's published guidelines, this can be considered a negligible impact for the neighbours.

6.2 L_{A90} (used to assess McDonald's fixed plant noise)

To ensure the operation of McDonald's fixed plant has a less than *adverse impact* on the neighbours, plant noise ($L_{A,r}$) should be limited to 5 dB below the lowest representative background sound level or 35 dB $L_{A,r}$, whichever is the highest.

The chart at 5.1 shows that if the restaurant trades right through the night then the lowest background sound level, at the neighbours, is 38 dB L_{A90} , thus plant noise should be limited to no more than 35 dB $L_{A,r}$.

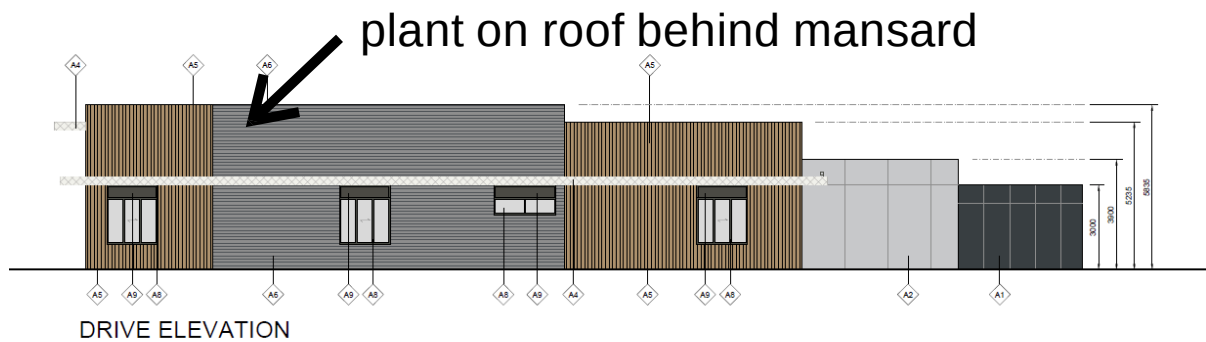
7 Fixed Plant Noise

7.1 Plant location and prediction of noise levels

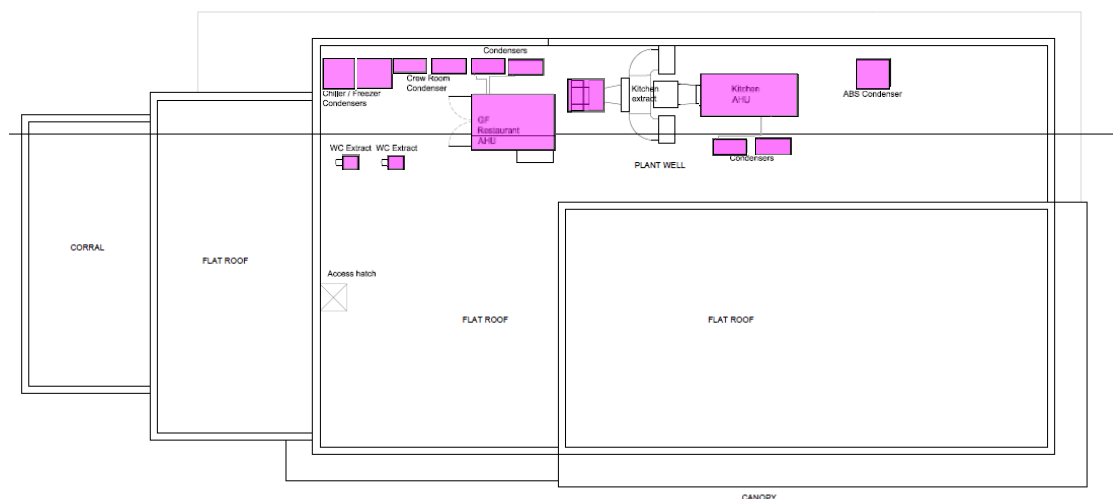
A 3D acoustic model has been prepared using IMMI software to represent the site and its surroundings and takes into account topography.

The plant will be located on the first roof of the restaurant building (model No. NG140) and the mansard roof elements will fully screen the view of the plant from the ground. The view from the drive thru lane is shown over page;

⁵ S & D Garritt Ltd report dated 28th October 2016



The layout of the plant is shown below with the items of plant highlighted in pink;



The plant will consist of the kitchen extract fan E1, the kitchen supply air handling unit S1 (with two associated condenser units), the restaurant air handling units S2 with two associated condenser units, the ABS condenser and a further two condenser units serving the crew room/manager's office and the door air curtain as well as the Chiller and Freezer Condensers.

The kitchen extract fan and air handling units will run continuously with the condensers cycling on and off subject to thermal demand.

The table below details the manufacturer's plant sound power levels;

Item	LwA dB	octave band centre frequency Hz					
		125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
Kit Ext BW10 500 Discharge	97	95	100	98	84	80	77
Kit Ext BW1010 500 Case	89	79	91	86	84	78	67
S1 Weatherite 200 FAI	80	80	81	78	72	70	69
S2 Weatherite 200 FAI	80	79	82	79	73	70	69
Freezer Condenser Danfoss OP-LPHM096	73	77	72	66	72	64	58
Chiller Condenser Danfoss OP-LPHM026	61	66	61	55	61	53	47
S1 & 2 condensers Mitsubishi PUHZ RP250YKA2 SLP at 1m	58	61	57	57	52	48	45
Manager/Crew Room 's condensers Mitsubishi MSZ-SF50VE3 SLP at 1m	52	55	51	51	46	42	39
ABS Drinks condenser	78	76	75	74	73	80	69
WC Extract fan	67	58	62	64	63	60	55

The level of sound created by all the plant running at full duty simultaneously has been calculated using Wolfe IMMI implementing the requirements of ISO9613 Part 2⁶ and assuming the following noise control measures are fitted;

Noise Control Item	octave band centre frequency Hz					
	125 Hz	250 Hz	500 Hz	1000 Hz	2000 Hz	4000 Hz
kit ext discharge silencer 2.4m long	29	41	50	50	50	50
Kit ext fan acoustic enclosure	22	32	38	45	43	40
S1 ,& 2 AHU FAI 1.5m long	15	22	45	45	33	25
ABS condenser mitigation pack inc vertical discharge silencer & 2 No. horizontal coil face intake silencers each 900mm long	6/7	8/14	12/24	18/26	19/24	16/16
Freezer Condenser mitigation pack including ac' louvres front & back 270mm deep	8	11	12	15	16	12

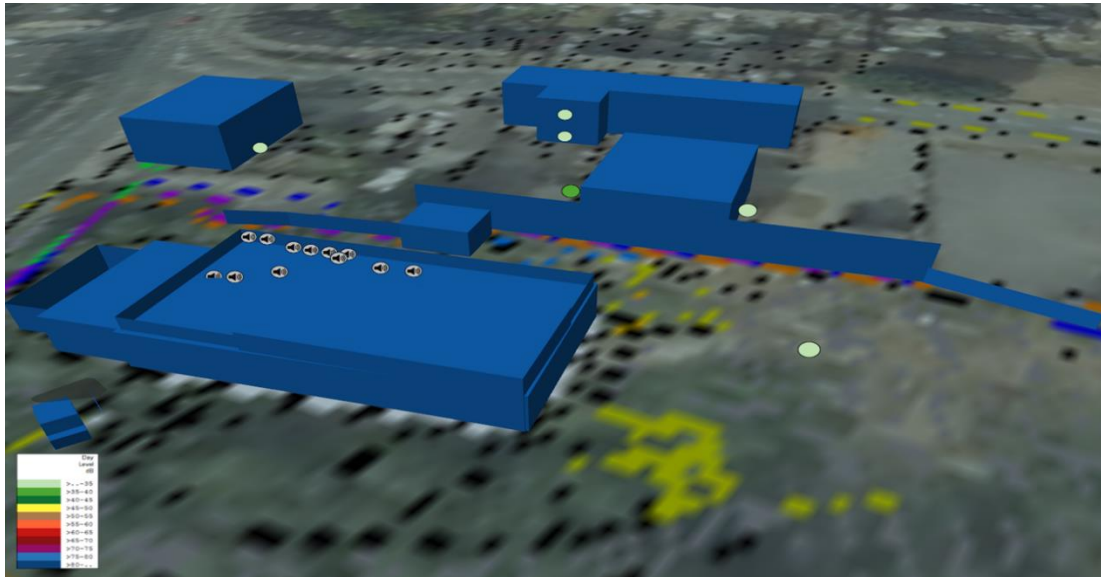
The standard Danfoss Chiller (ULTRA LT3357-3), which has a quoted noise level of 41 dBA at 10m free field and an approximate sound power level of 68 dB L_{WA}. This condenser will have to be fitted with an Attenuation Pack, consisting of acoustic louvres covering the coil faces front and back reducing radiated sound levels by at least 7 dB.

The ABS drinks cooler condenser is also too noisy and will need to have an Attenuation Pack fitted to reduce radiated levels by at least 10 dBA and this will consist a circular discharge

⁶ 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).

silencer fitted vertically over the condenser fan, 900mm high (no central pod) and rectangular splitter silencers, again 900mm long in the horizontal either side of the unit

The image below shows the restaurant building and neighbours;



The table below shows the predicted plant sound levels;

Location	Plant Noise
	L _{r,A} /dB
18B Owl Lane	35
732 Leeds Road	32

The table over page shows the contribution of each item of mechanical services plant from the loudest at the top to the quietest at the bottom, outside 18B Owl Lane 1st floor windows;

18B Owl Lane 1st R*	125 Hz L _{r,i} /dB	250 Hz L _{r,i} /dB	500 Hz L _{r,i} /dB	1000 Hz L _{r,i} /dB	2000 Hz L _{r,i} /dB	4000 Hz L _{r,i} /dB	8000 Hz L _{r,i} /dB	L _{r,A} /dB
S2/C2	35	28	25	19	14	5	-6	26
S2/C1	35	28	25	19	14	5	-6	26
ABS	29	27	24	21	16	12	5	26
S2/C3	33	27	24	18	13	4	-8	25
S2/C3*	32	27	24	18	13	4	-8	25
Kit extract Disch	24	17	6	-8	-12	-16	-16	24
S1/C2	33	26	22	16	10	1	-9	24
Freezer	25	23	22	19	14	11	3	24
S1/C1	32	26	22	15	10	0	-10	24
Chiller	20	19	18	15	10	7	-1	20
S1 200 FAI	29	22	-4	-11	-2	2	-2	17
Kit extract case	23	17	0	-12	-17	-18	-32	16
S2 200 FAI	24	21	-5	-12	-4	1	-3	14
WC2	8	4	-11	-16	-13	-11	-17	-1
WC1	9	3	-12	-18	-15	-14	-20	-2
Sum spectrum	42	36	33	28	23	17	9	52
Sum spectrum Awt	26	28	30	28	24	18	8	35

This shows that the maximum plant noise level is 35 dB L_{A,r} outside the closest overlooking neighbouring window at 18B Owl Lane.

7.2 Assessment of Plant Noise Levels

McDonald's plant will run without perceivable tonality or impulsivity and at a level, by comparison to the background, not to attract penalties either for intermittency or "other characteristics", consequently the L_{A,r} (Rating Level⁷) will be the same as the L_{Aeq} level.

The lowest night time background sound level was 38 dB L_{A90}. To ensure plant noise does not present an adverse impact on the neighbours it is recommended that it is limited to be no more than background – 5 dB or 35 dB L_{A,r}, whichever is the highest. Here this would require plant noise to be limited to no more than 35 dB L_{A,r}.

The predicted (100% duty) attenuated plant noise levels is 35 dB L_{A,r} at the nearest neighbour, and therefore meets the proposed criteria.

8 McDonald's customer vehicle noise

8.1 Car Parking & drive thru noise

To assess whether the new customer activity will have an impact on the adjacent residents a comparison should be made between the noise generated by new McDonald's customers and the existing noise climate.

To make this assessment a noise survey was carried out to identify the noise created by cars and vans using a drive thru lane of a McDonald's as well as parking up and using the restaurant itself (eating in).

⁷ BS4142:2014 Section 9 Rating Level

The table below shows the mean loudest recorded sound levels, activity duration, the calculated SEL levels and derived sound power levels (L_w) which will be subsequently used in the noise predictions;

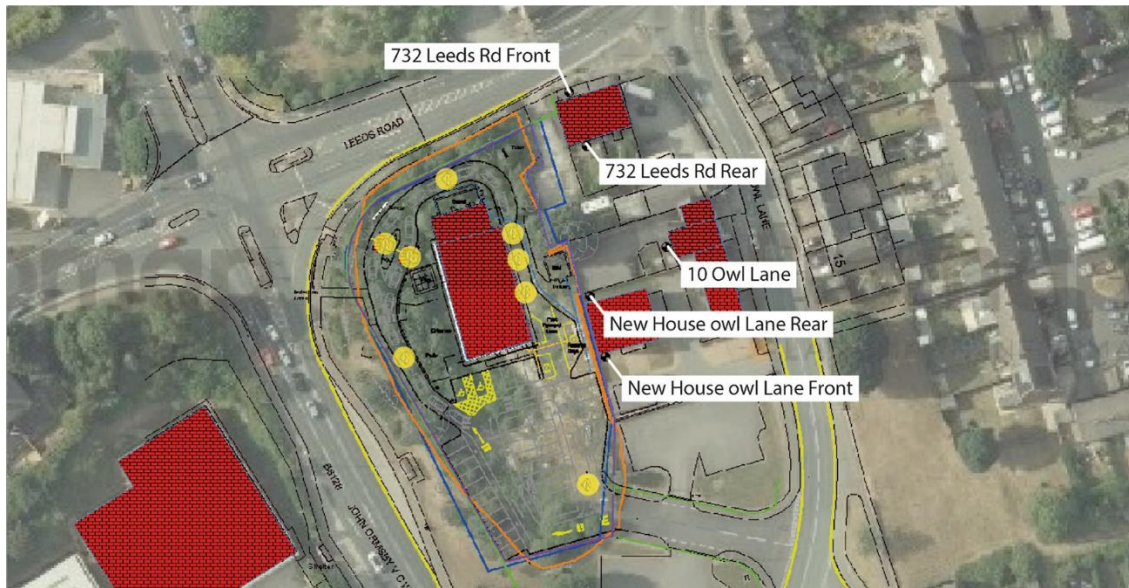
Element	Duration seconds	Sound Level at (m) dB LAeq,T	measurement distance measurement	SEL dB	Derived Lw SEL dB
Drive Thru					
drive off street and stop at COD ⁸	10	65	5	75	97
make order with engine at idle	63	75	1	93	101
drive to Pay Point	6	67	5	75	97
pay at Pay Point with engine at idle	20	63	5	76	98
drive to Collection Point	8	67	5	76	98
collect food engine at idle	20	63	5	76	98
drive out and off down street	9	71	5	81	103
Parking					
drive in, back up, park, get out and shut 2 car doors get in car, shut 2 x doors & drive off	64	61	5	79	101
Vehicle Door Slam at 1m	1	88.0	1	88	96

ADL Traffic Ltd has confirmed the following estimated customer vehicle numbers for the critical “quiet” hours through the late evening (11pm to midnight), overnight (2 to 3am) and first thing in the morning (6 to 7am) for the busiest day of the week Friday;

Time	Friday		
	In	Drive thru	Car Park
02:00	10	5	5
06:00	49	34	15
23:00	47	28	19

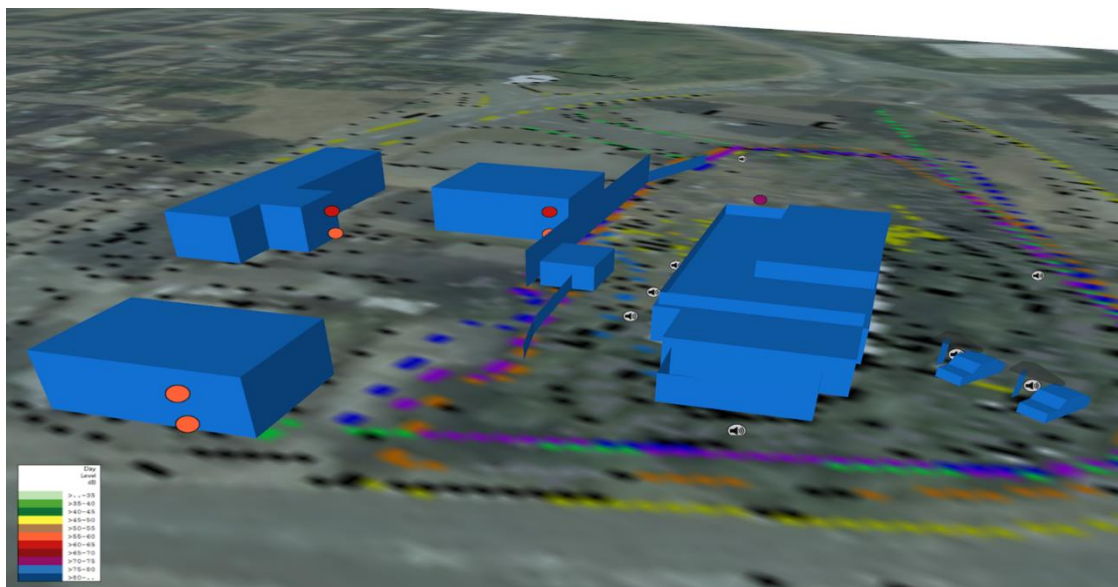
The noise levels generated by the customer vehicle movements at the proposed development have been predicted in accordance with the noise prediction framework set out in ISO 9613-2 Acoustics - Attenuation of sound during propagation outdoors - Part 2 General method of calculation, using IMMI noise modeling software. Sound levels have been calculated for each of the properties shown on the image below;

⁸ Latest Customer Order Display operates on an automatic ambient level control so it is no louder than is required to be heard, when ambient levels are quieter in the evenings the play back volume of the member of staff will be reduced accordingly.



The model takes into account the distance between the sources and the receptors, reflections from building facades, attenuation from screens as well as atmospheric attenuation. The following modelling assumptions have been relied upon;

- G = 0 (hard ground)
- Air temperature 10 °C,
- Humidity 70%,
- Downwind propagation,
- All reception points are at 1st floor window level,
- 4.6m tall acoustic screen⁹ running along the eastern boundary, as shown below;



The image above shows the acoustic model for the calculation of car drive thru noise, the yellow dots represent the various elements of the drive thru activity (set out in Table at 8.1).

⁹ <https://www.mobilane.com/en/products/noistop-acoustic-barrier-fencing/> or similar

The overall sound level created by a single vehicle, which will take approximately 2 minutes to arrive, order, collect and leave the drive thru lane, before being multiplied up for the number of vehicles predicted to pass through the drive thru lane in each hour.

Noise levels were calculated at each of the neighbours shown below, but highest levels of drive thru noise will be experienced at the rear 1st windows of 18B Owl Lane and 732 Leads Road.



The two tables over page shows the number of vehicles expected to use to the restaurant in the evening, night and early morning, the measured ambients, the contribution from the use of the drive thru lane and car park¹⁰ separately and together along with the dB increase expected at the 1st floor rear windows of 18B Owl Lane;

Time	Predicted customer vehicle nos on a Friday		Measured ambient Laeq,1hr dB	Predicted McDonalds activity noise			McD's increases ambient sound level by dB
	Drive Thru	Car Park		total DT Laeq,1hr	total CP Laeq,1hr	total DT + CP Laeq,1hr	
03,00	4	2	49	33	25	34	0.1
06,00	34	15	56	42	34	43	0.2
23,00	28	19	56	41	35	42	0.2

This shows that 4 cars are predicted to use the drive thru lane and 2 to park up and eat-in in the hour from 3am, with the use of the drive thru lane creating 33 dB $L_{Aeq,1hr}$ and of the car park 25 dB $L_{Aeq,1hr}$ giving a combined level of 34 dB $L_{Aeq,1hr}$, from McDonald's site, and the impact of this on the measured ambient sound level at 3am of 49 dB $L_{Aeq,1hr}$ is only 0.1 dB.

At 6am in the morning, when the background sound level is higher there is a similar modest increase created by the use of McDonald's site, despite the number of customer rising from 6 to 49 in the hour.

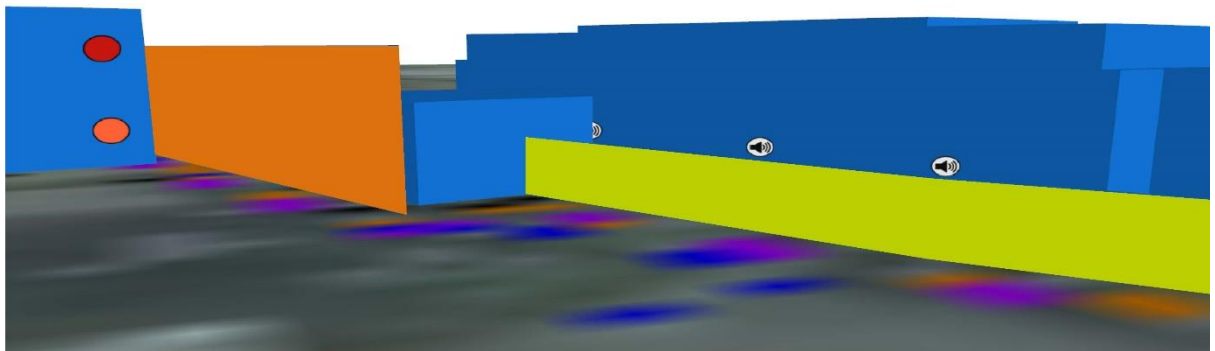
¹⁰ For the purposes of this worst case calculation it is assumed that the same parking space is used repeatedly directly in front of the restaurant are being used, as these created the loudest levels at the NSR's.

The 4.6m high acoustic screen breaks the line of the sight from the upstairs windows of 18B Owl Lane of the drive thru lane completely.

The table below shows the same set of information for drive thru and car park noise at the rear windows of 732 Leeds Road;

Time	Predicted customer vehicle nos on a Friday		Measured ambient Laeq,1hr dB	Predicted McDonalds activity noise			McD's increases ambient sound level by dB
	Drive Thru	Car Park		total DT Laeq,1hr	total CP Laeq,1hr	total DT + CP Laeq,1hr	
03,00	4	2	49	38	18	38	0.3
06,00	34	15	56	48	27	48	0.6
23,00	28	19	56	47	28	47	0.5

This shows that the impact at the rear windows of 732 Leeds will be similarly low, less than 0.6 dB. The image below shows the view from the rear windows across to McDonalds site;



8.2 Assessment of McDonald's customer vehicle noise

It has been shown that the use of McDonald's site, even during the quiet hours of the night and early morning, will increase the ambient sound levels by less than 1 dB, due to the sound masking offered of existing traffic using the Shaw Cross Junction and the acoustic benefit provided by the substantial 4.6m high acoustic screen.

Increases of 1 dB can be considered as a "negligible" impact and therefore below the onset of an "adverse impact".

8.3 Car door slams

With the proposed opening hours being 24 hours per day, the restaurant will be trading through the night time period when sleep disturbance should be considered.

Although the customers using the restaurant are not inherently noisy the closing of car doors is an impulsive activity which could draw attention.

Tests have been carried out on a range of cars and vans, with their doors being firmly swung closed and it was found that an event sound level of 88 dB L_{Amax} at 1m represented the upper end of the vehicles tested with a slamming action. An assumed sound power level of 96 dB L_{WA} was inputted into the IMMI model, to represent the sound of a customer closing their car doors, in the closest parking bays to 18A & B Owl Lane to determine which bay will create the highest levels at the neighbours.

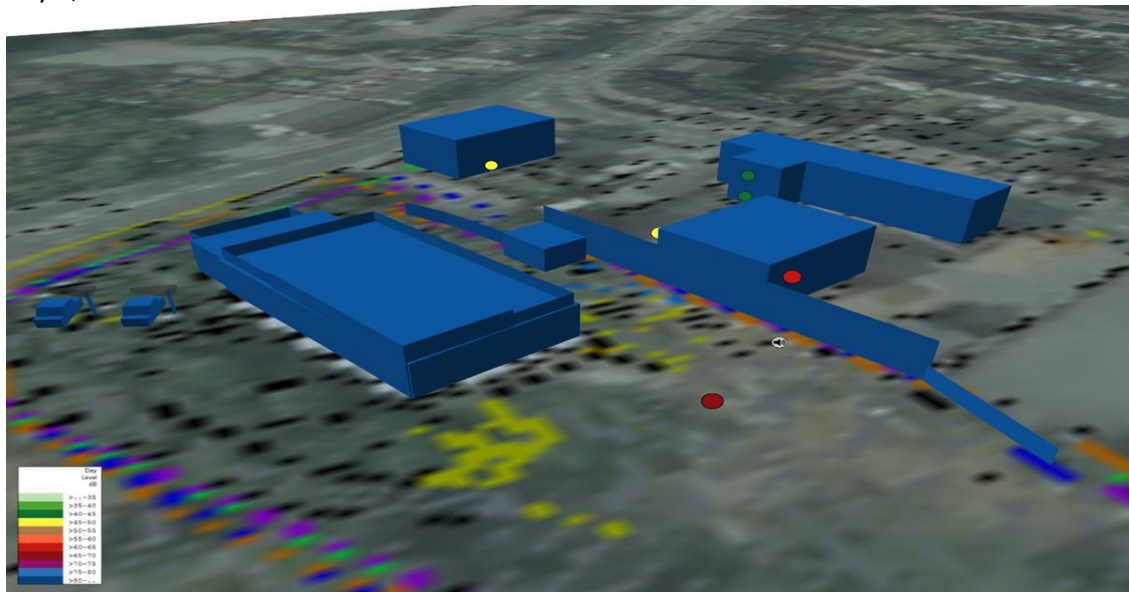
The image below shows the parking bays (0 to 7) which have been modelled;



The table below shows the highest L_{Amax} from the closest parking bay (0) to the 18A & B Owl Lane with a level of no higher than 60 dB L_{Amax} to be expected.

Receiver	with 4.6m high acoustic screen							
	Slam 0 dB L _{Amax}	Slam 1 dB L _{Amax}	Slam 2 dB L _{Amax}	Slam 3 dB L _{Amax}	Slam 4 dB L _{Amax}	Slam 5 dB L _{Amax}	Slam 6 dB L _{Amax}	Slam 7 dB L _{Amax}
732 Leeds Rd GF R	44	42	41	41	45	38	37	37
732 Leeds Rd 1st R	44	42	41	41	45	38	37	37
732 Leeds Rd GF F	32	32	31	31	33	30	30	30
732 Leeds Rd 1st F	35	35	34	34	36	32	32	32
Owl Lane GF F	55	54	52	51	47	46	45	44
Owl Lane 1st F	60	59	58	57	54	53	53	52
Owl Lane GF R	44	43	42	41	45	44	43	43
Owl Lane 1st R	50	49	48	47	53	52	52	51
10 Owl Lane GF	40	40	39	39	42	42	42	42
10 Owl Lane 1st	42	42	41	41	45	44	45	45

The 3D image below shows a small speaker symbol representing the position of the slam in Bay 0;



8.4 Assessment of McDonald's customer car door slam noise

The L_{Amax} created by customers getting in and out of their cars, slamming their doors, at the 1st floor windows of the closest neighbour, 18B Owl Lane, in the closest parking bays will range from 32 to 60 dB. Levels which meet and substantially better the W.H.O. derived criteria to prevent sleep disturbance.

Even the closest and loudest door slam will be the same order of magnitude to those which the neighbours are exposed from traffic using Shaw Cross junction.

On this basis the impact of this type of event level can be considered to be less than *adverse*.

8.5 Delivery noise

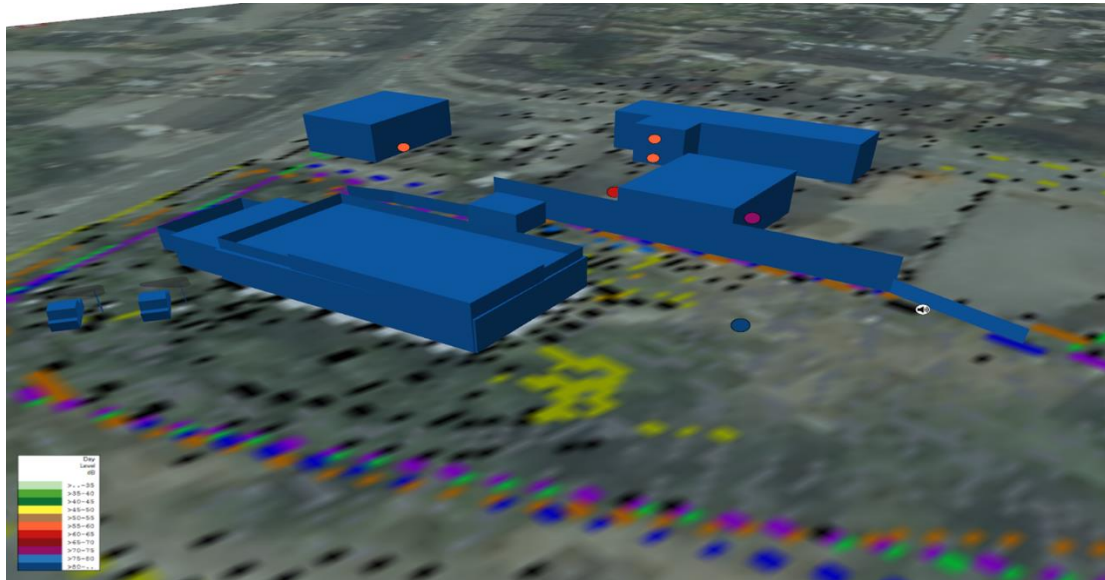
The restaurant is likely to require 3 deliveries per week; these deliveries being carried out by Martin Brower UK.

Martin Brower is a McDonald's partner logistics company and supply all their restaurants nationally. They have recently won a Highly Commended award from the Noise Abatement Society *"for its understanding of the holistic spirit of Soundscape principles through a variety of sustained best practices to enable efficient servicing without causing noise disturbance."*

Martin Brower's delivery activities have been surveyed with a delivery activity sound level of 67 dB $L_{Aeq,5minutes}$ (92 dB SEL) at 5m being recorded. Here, the delivery lorry will drive in to McDonald's car park, pulling up along the restaurant car park to off load and recyclable collect waste. Once stopped the delivery vehicle turns off both its engine and the chiller units before using a tail lift to move cages of fresh and chilled foods from the vehicle into the restaurant before recyclable waste (card board and cooking oil) and loaded back on the lorry. This

process takes around half an hour from start to finish. The active element of the delivery process, when the lorry is maneuvering on site, will take around 5 minutes.

The image below shows the approximate location (small speaker symbol) of the delivery vehicle in its off-loading position;



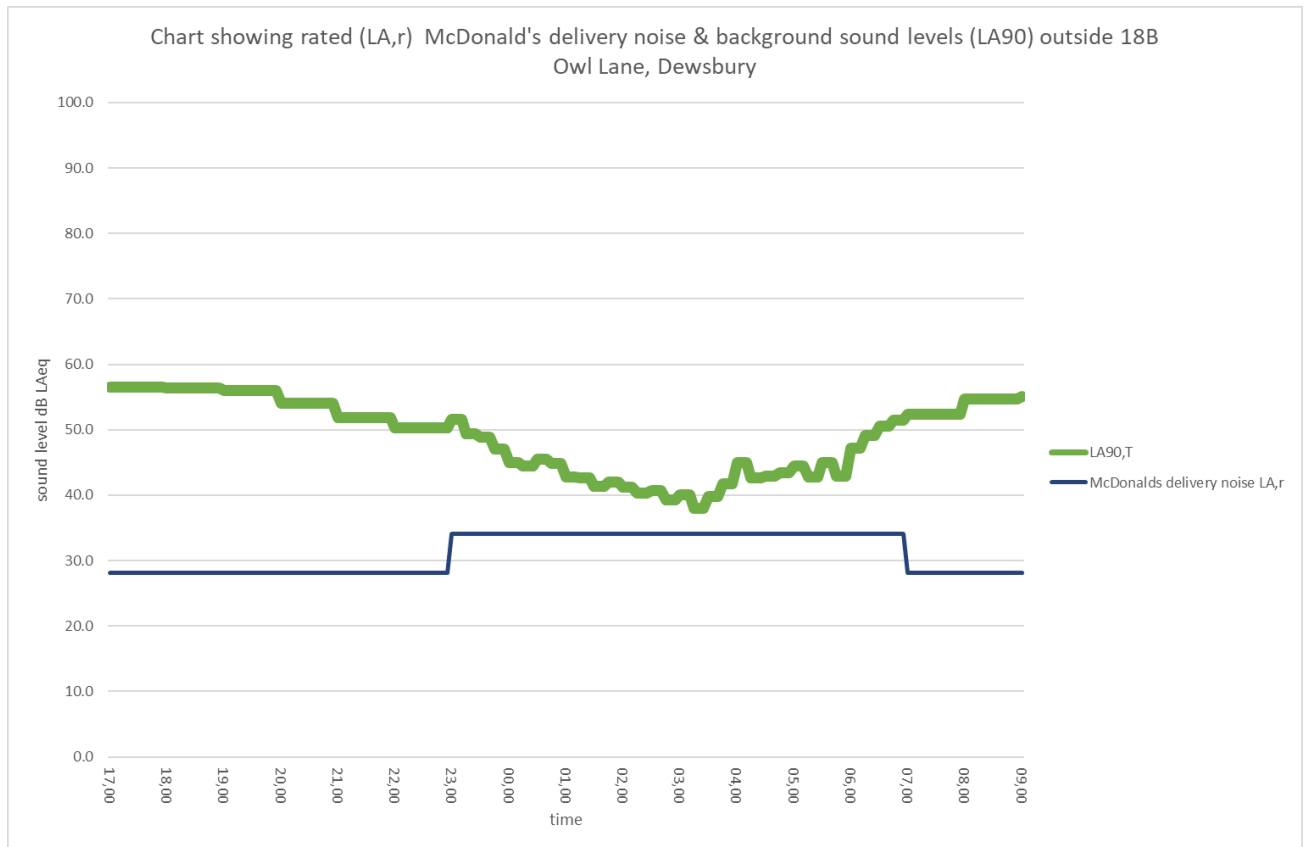
The table below shows the noise contribution for the delivery activity (as a Rating Level according to BS4142)¹¹;

Location	Delivery vehicle noise	
	Day time LA,r,1hr	Night time LA,r,15min
o/s 1 st flr 18B Owl Lane	28	34

The night time level is 6 dB higher than the day time one as the duration over which the activity is considered is only 15 minutes whereas during the day (7am to 11pm) it's 1 hour.

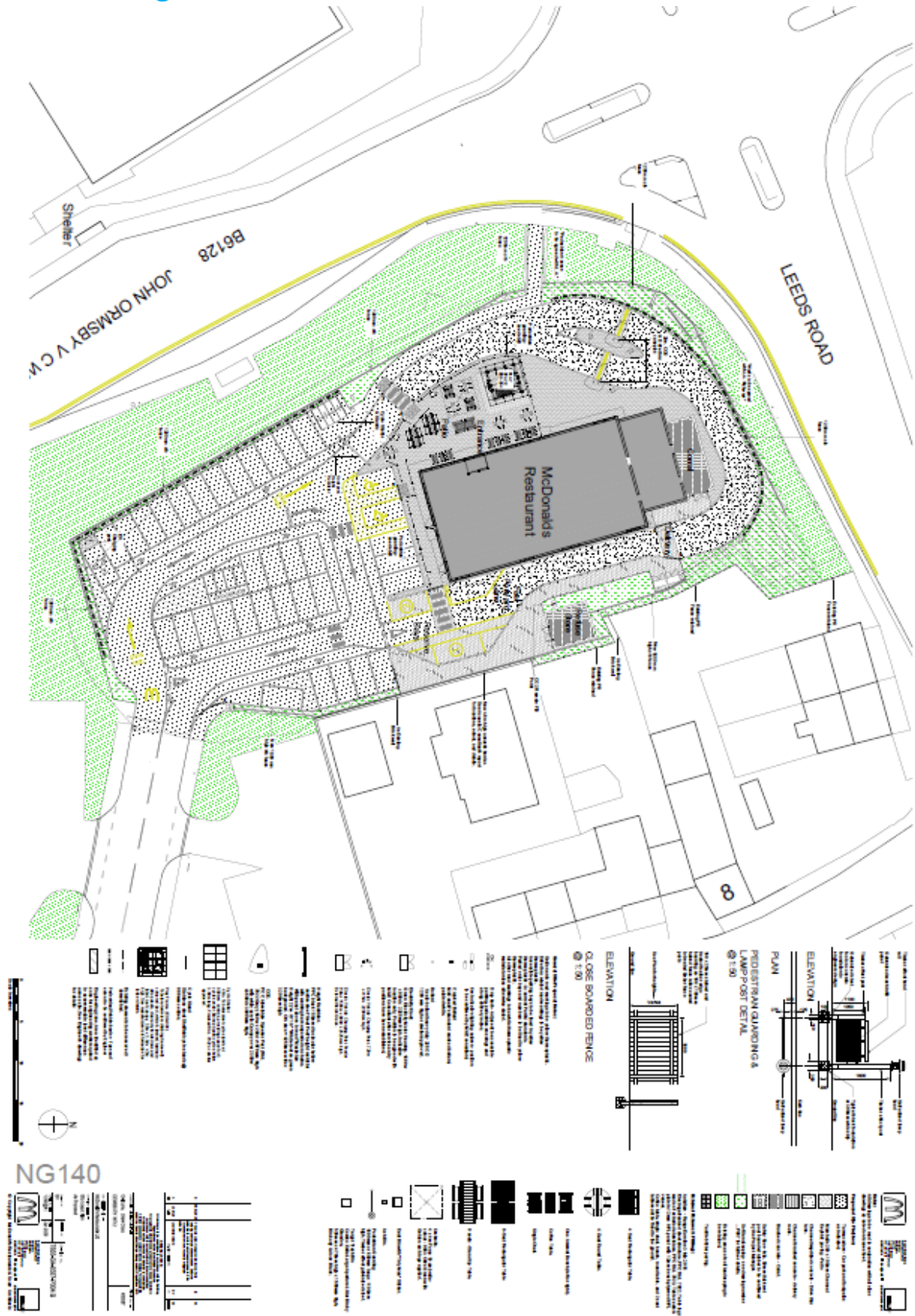
¹¹ Full details of these calculations can be made available upon request, a 3 dB "other penalty" has been added to the predicted $L_{Aeq,T}$ to give a Rating Levels $L_{A,r}$ (BS4142:2014)

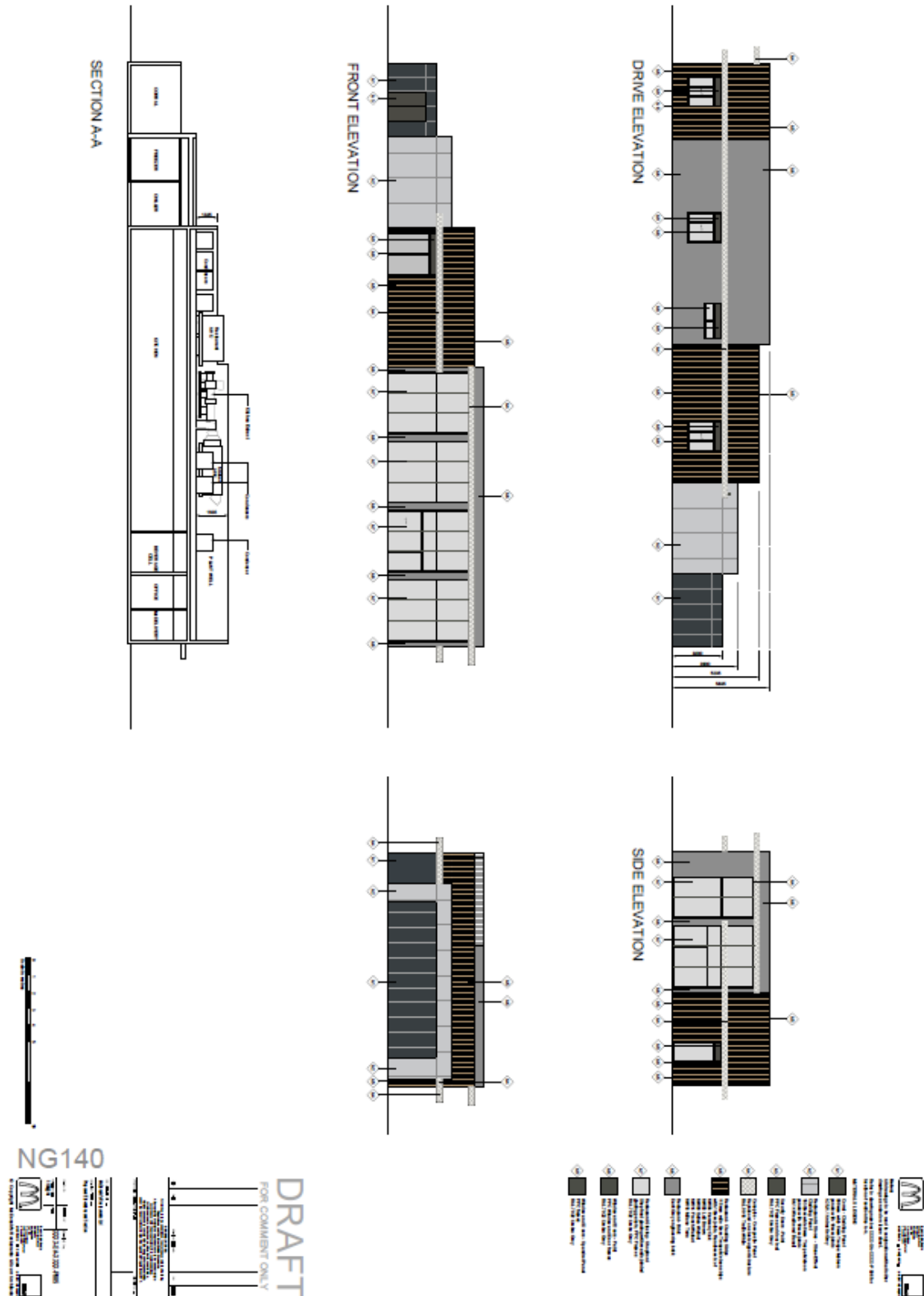
The chart below shows the existing $L_{A90,T}$ levels outside the houses on Owl Lane as well as with the predicted delivery noise (as a Rating Level $L_{a,r}$);

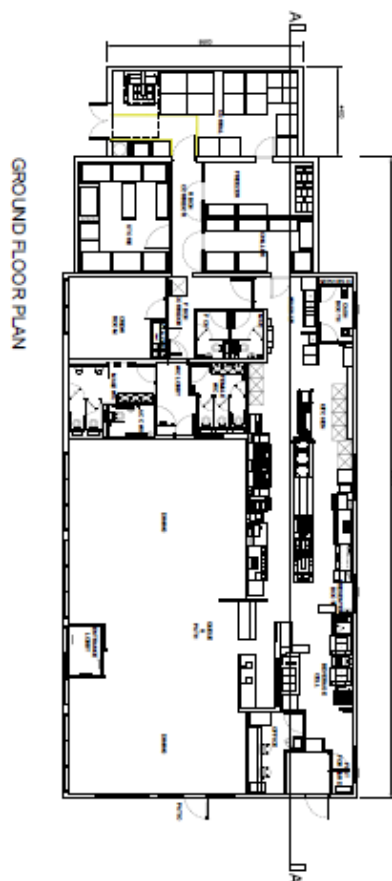
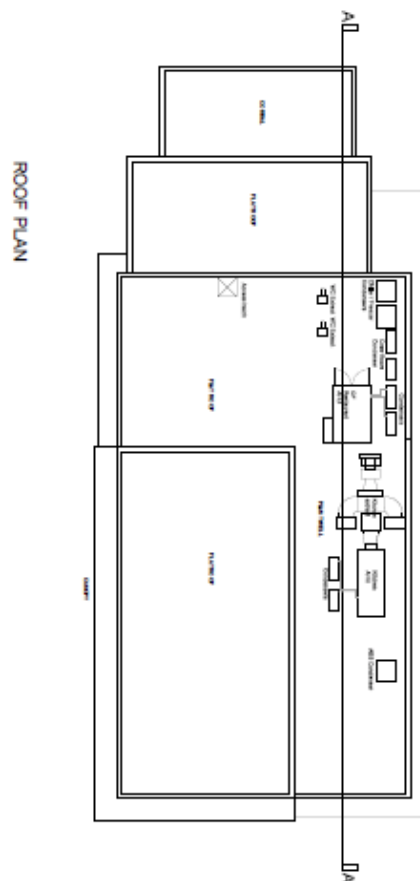


This shows that Rated delivery noise levels will be no higher than the existing background sound level through the day and night and will therefore have a “low impact”, less than “adverse” on the neighbours. Delivery hours therefore do not need to be limited.

Site Plan Drg No. 7866-SA-8587-P004B







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