

**Date:** 12<sup>th</sup> November 2014

**Our Ref:** LA/1399/01aR/ML

**McDonald's Restaurant  
24 Cambridge Circus, London WC2H 8AA**

Noise Impact Assessment

**Client:** McDonald's Restaurants Ltd.  
6 Victoria Road  
Sutton Coldfield  
B72 1SY



**Prepared by:** .....

Martin Loven BSc (Hons) MIOA

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## 1. BRIEF FOR CONSULTANCY

- 1.1. Travel to site in Cambridge Circus and carry out baseline noise survey at location representative of identified receptors.
- 1.2. Using survey data and manufacturers' noise data for new external plant, predict the specific noise impact of the roof-top plant at receptor façades, during the most sensitive proposed opening hours, and compare with agreed planning criteria.
- 1.3. Consider the impact from noise generated by customer entry and egress to the restaurant during the early morning hours proposed, in context with the existing noise environment.
- 1.4. Provide technical report, presenting findings and conclusions, including any recommended mitigating measures necessary to meet the local authority criteria, in a format suitable as a supporting document for an application for varying a planning condition to allow earlier opening hours.

## 2. SUMMARY

- 2.1. McDonald's Restaurants is applying for planning consent to vary a condition imposed on the permission for change of use of the Leon de Bruxelles restaurant in Cambridge Circus. Planning Condition 3 of application ref. 2014/3237/P restricts the hour of opening to 08:00; the new application is seeking opening from 05:00 Monday to Saturday.
- 2.2. The local planning authority requires the assessment of noise from the new external plant against BS 4142: 1997 criteria at the closest receptor façades during the quietest period of the proposed earlier opening hours. Specifically, noise from the plant should not exceed a level 5dB below the quietest background noise level at the receptor façades.
- 2.3. The assessment found that the cumulative specific noise from the new elements of external plant on the roof-top plant deck of the restaurant is predicted to be at worst equal to the quietest existing background noise level at the closest receptor property. This level is 5dB higher than the criterion, so practical mitigation measures in the form of an acoustic barrier across an opening gap in the plant deck, and a post-fan silencer on the kitchen extract flue have been recommended. With these measures in place the predicted noise impact from the plant will be reduced by 7dB, therefore meeting the local authority criterion.
- 2.4. It should be noted that as a consequence of the new plant and mitigation measures noise from plant affecting the receptors will be significantly quieter during the day from 07:00 than the current plant generates.

- 2.5. Noise from customers entering and leaving the restaurant during the early morning hours is not considered likely to be detrimental to the amenity of local residents. The ambient noise level in Cambridge Circus is relatively high throughout the night and therefore normal customer activity is unlikely to be noticeable. Any extreme behaviour will be dealt with diligently by store management.
- 2.6. In conclusion, it is therefore considered that this assessment demonstrates that if the recommended mitigation measures to control plant noise are implemented, the requirements of the local authority noise criteria will be met, and no further noise mitigation measures should be necessary. This document is therefore considered suitable to support a planning application for the variation of Planning Condition 3 of application reference 2014/3237/P to allow opening of the McDonald's store from 05:00 Monday to Saturday.

### **3. INTRODUCTION**

- 3.1. McDonald's Restaurants has recently obtained planning permission for change of use of the ground floor and basement of 24 Cambridge Circus, London WC2H from A3 to A3/A5 use. The site is currently a Leon de Bruxelles restaurant. McDonald's is proposing to apply for a variation of Planning Condition 3 of the London Borough of Camden application reference 2014/3237/P, which restricts the morning opening hours to 08:00 seven days a week. The variation application proposes opening hours of 05:00 Monday to Saturday, with Sunday trading and closing hours unchanged.
- 3.2. Refurbishment works associated with the change of use include replacement of the external roof-mounted HVAC plant, including a new kitchen extract system and air-handling units. Whilst much of the plant will be contained internally in basement plant rooms, there will be a number of outside condenser units associated with the cooling and heating of staff and customer areas and kitchen extract motors, fans and discharge terminal.
- 3.3. The plant will be situated on the sixth floor roof of the seven-storey building in a bespoke area currently housing the existing restaurant plant, as well as plant associated with a neighbouring restaurant. Part of the plant area overlooks a light well situated above the ground floor restaurant which has a number of upper floor residential apartment windows up to the level of the plant deck. These are the closest identified noise-sensitive receptors and will be assessed for impact from the operation of the new plant during the extended hours.

- 3.4. Camden Council Environmental Health department, as consultee to the planners, requires the submission of a noise assessment of the impact of the new external plant to support an application for variation of the condition, as the early morning hours are noise-sensitive. It is understood that the existing extract plant associated with the restaurant switches on from approximately 07:00.
- 3.5. It is noted that in the past planning officers have expressed concern about noise from customers entering and leaving the premises. This cannot be objectively assessed as noise levels from customers cannot be predicted, but a subjective assessment will be made regarding the likely impact from early morning customer entry and egress from the restaurant.
- 3.6. Loven Acoustics has been commissioned to carry out an assessment of the impact of noise from the operation of the replacement roof-top plant, and provide a report with the information needed to support the new application for variation of Condition 3 of application ref: 2014/3237/P.

#### 4. PLANNING CRITERIA & RECEPTORS

- 4.1. Following a discussion with Monica Mulowoza, Camden Council Environmental Health Officer and consultee to planners (hereafter referred to as the EHO), it was agreed that external HVAC plant was the noise source of concern to them. The EHO advised that plant should be assessed in accordance with the methodology and criteria of BS 4142: 1997.
- 4.2. The criterion for assessment BS 4142: 1997 '*Rating industrial noise affecting mixed residential and industrial areas*' compares the specific noise from the operations of the plant (rating noise), with the existing background noise level at the identified receptor properties. From this comparison it is possible to determine the likelihood of complaints in accordance with the standard's criteria. Camden Council requires that the rating noise is lower than the quietest background noise by at least 5dB at any time or by 10dB if the plant demonstrates any discrete tonal characteristic.
- 4.3. The closest noise-sensitive receptors have been identified as:

**Receptor R1** – Upper floor apartments overlooking a central light well above the ground floor restaurant. A number of windows from the apartments overlook an area of the plant deck currently containing the existing kitchen extract plant and air-handling units, as well as other plant associated with a neighbouring restaurant. The closest windows are approximately 8m from the plant deck.

The location of the receptors is shown on Figure 1 in the appendix.

There were no other visible residential receptors in the vicinity liable to be affected by the new plant.

## 5. EXISTING NOISE ENVIRONMENT

5.1. A baseline survey was carried out over a 22-hour period to include the morning of Wednesday 10<sup>th</sup> September 2014. Broadband measurements were taken including the time from 04:30 (to include a 'warm up' period) to 08:00, to measure the existing noise environment affecting the identified receptors during the proposed extension hours, including background (dB<sub>L<sub>A90</sub></sub>) readings.

5.2. The measurement position was as follows:

**P1** – Within the light well where the R1 receptor windows are located. The microphone was attached to the end of a 4m pole in front of the closest receptor window to the plant deck at a distance of 2m from the window.

5.3. The survey period was representative of the quietest noise environment likely to be currently experienced by the receptor properties at any time during a typical weekday.

5.4. Table 1 below shows a summary of the quietest period of measured noise data during the survey, to enable assessment of the roof-top plant based on the lowest L<sub>A90</sub> 'background' level. Survey details and an explanation of the noise terms are shown in Appendix 1 of this report. Figure 1 in Appendix 2 shows the measurement position in relation to the identified receptors, and the full survey data are shown in Table 6 in Appendix 2.

**Table 1.** Summary of quietest existing ambient noise levels at representative receptor location

Sample Time	dB L <sub>Aeq</sub>	dB L <sub>Amax</sub>	dB L <sub>A90</sub>
04:45	51.0	63.2	<b>49.7</b>

5.5. Subjectively the dominant noise source affecting the area was existing plant noise from a number of roof top sources in close proximity to the area. There was also a constant background of traffic and activity noise from the local road network.

5.6. The background noise level measured (marked in bold) shall be used as the base-line value to be assessed.

## 6. SPECIFIC NOISE ASSESSMENT

### Roof-top plant

6.1. The refurbishment of the restaurant will include the replacement of a number of items of external plant associated with normal operations located on the sixth-floor plant deck. The following lists the outdoor elements of the plant that have the potential to generate noise of any significance, and their distance from the identified receptor façade. Figure 2 in the appendix shows the proposed location of the new plant.

- Kitchen extract – RHF BW10/500 – 12m to R1 façade
- Freezer/ Chiller condensers (x2) – 14m to R1 façade
- Air con condensers –
  - Mitsubishi PUAZ-RP250 (x7) – 8-11m to R1 façade
  - Mitsubishi PUAZ-RP35 (x2) - 17m to R1 façade
  - Mitsubishi PUAZ-RP140 (x2) – 10/16m to R1 façade

6.2. From discussion with the plant engineers it was evident that during the proposed extended hours of 05:00 to 08:00, due to reduced loading at that time of day, not all the condenser units would be operational, with only up to four of the RP250 units in operation simultaneously. However all other units and the extract could be operating.

6.3. Table 2 below summarises the plant manufacturers' noise data (sound pressure level normalised to a distance of 1m). Where insufficient data were available from the manufacturer, in-situ noise measurements of identical operating plant at a McDonald's site have been used.

**Table 2.** Proposed plant noise data - per unit (dB L<sub>eq</sub>)

New plant proposed	Over-all level per unit (@1m)	Octave band centre frequency (Hz)							
	L <sub>Aeq</sub>	63	125	250	500	1k	2k	4k	8k
BW10/500 Extract fan/motor	67	63	58	64	53	47	44	41	30
Extract flue terminal	71	77	75	76	69	64	60	59	54
PUHZ-RP250	59	64	64	59	57	54	50	44	37
PUHZ-RP35	46	51	54	47	41	42	35	38	37
PUHZ-RP140	51	58	56	55	49	46	42	36	29
Freezer/Chiller Cond.	65	59	60	60	59	62	58	53	47

- 6.4. It should be noted that although the octave data shown above are not specifically utilised in the assessment methodology, they are shown to identify any discrete tonal characteristics (i.e. 5+dB higher than adjacent higher and lower octave band centre frequencies) which could have increased perception and annoyance. Where this is the case - in this instance for the 250Hz value on the extract fan/motor - the appropriate BS 4142 penalty of a 5dB addition will be applied.
- 6.5. In order to determine the impact of each item of plant at the receptor façades it is necessary to consider the following factors:
- The distance from the unit to the nearest façades
  - Shielding provided by structures on the plant deck between the unit and receptor
  - The cumulative noise level from the number of units that may operate simultaneously.
- 6.6. Table 3 below shows the calculations to determine the cumulative noise level from all plant operating during the proposed extension hours.

**Table 3.** Predicted cumulative plant noise impact on receptors – dB  $L_{Aeq}$

Details	BW10/500	Extract Flue	RP 250	RP 35	RP 140	Chiller
$L_{Aeq}$ @ 1m / unit	67	71	59	46	51	65
No. of units	1	1	4*	2	2	2
Distance to façade (m)	12	12	8**	17	10/16	14
Distance correction - dB	-21	-21	-18	-24	-20/-24	-23
Shielding***	-8	-6	0	-10	-5/-10	-5
BS 4142 tonal penalty	+5	0	0	0	0	0
Façade level all units	43	44	47	15	26/17	40
Cumulative level at façade	50					

\* Predicted no of units in operation simultaneously between 05:00 to 08:00

\*\* Closest unit to receptor

\*\*\* Shielding from existing structures on the plant deck to ensure no line of sight

- 6.7. Table 4 below summarises the BS 4142: 1997 based assessment of plant noise from the plant deck enclosure at the upper floor windows of the identified receptors based on cumulative effect of items running over the BS 4142 night-time reference period of 5 minutes (pre-07:00).

- 6.8. The quietest operational period - allowing for 30- minute warm up before 05:00 opening - is being assessed as it represents a 'worst-case' scenario, and is the period at which most noise-sensitivity is likely. Clearly daytime ambient noise levels will be higher and the impact of the plant – which would operate at a steady noise level – will be proportionally less.

**Table 4.** Predicted plant noise impact on receptors  
(BS 4142 methodology) – dB

Details	Receptor R1
Specific noise from plant at facade - cumulative (Table 3) dB L <sub>Aeq</sub>	50
Measured background level (quietest dB L <sub>A90</sub> from Table 1)	50
Difference	0
Local Authority criterion (B/G L <sub>A90</sub> -5dB)	45
Shortfall to criterion - dB	5

\* Calculation based on path level difference from top of plant to top of windows of receptor façades facing the site

- 6.9. It can be seen in the table above that at worst the predicted noise impact as assessed against the criteria of BS 4142: 1997 for receptor R1 is 5dB higher than the local authority criterion of at least 5dB below the quietest background noise level at the receptor façades. In order to meet the criterion mitigation measures will be required and this will be discussed in the following section.

## 7. MITIGATION & CONCLUSIONS

- 7.1. This assessment has demonstrated that noise generated by the new proposed external plant, including kitchen extract and air-handling condenser units located on the sixth-floor roof plant deck of the restaurant building is predicted to result in a cumulative noise level at the façade of the closest noise-sensitive receptor of 50dB  $L_{Aeq}$ , equal to the quietest measured  $L_{A90}$  background noise level. The local authority criterion is that the cumulative plant noise shall not exceed 5dB below the quietest background level, so there is predicted to be a shortfall of 5dB to meet the criterion. Tonal characteristic has been allowed for in the calculations where necessary.
- 7.2. In order to meet the local authority criteria it will be necessary to carry out mitigation works to reduce the plant noise at the receptor façades by at least 5dB. The proposed works to achieve this are as follows:
- Installation of a solid barrier to infill the space between masonry walls at the edge of the plant deck overlooking the receptors light well. This will provide attenuation ranging between 5dB and 10dB for the various plant items fixed to the plant deck.
  - Installation of a post-fan silencer pod in the kitchen extract flue duct. This could typically attenuate the noise breakout from the flue terminal by between 5dB and 15dB depending on the length of the pod and depth of absorbing material in the pod.

Details of the above mitigation follow.

### Barrier across opening to light well

- 7.3. Currently the edge of the plant deck has a brick parapet wall at a height of approximately 600mm topped with metal railing. The proposed barrier could sit on top of the parapet or be positioned in front of it and should extend to the height of the eaves of the light well roof. Figures 2 and 3 in the appendix indicate the proposed location and extent of the barrier.
- 7.4. The barrier should be of solid construction with a timber or metal frame supporting panel/s with an outer skin (facing the light well) of metal sheet (at least 3mm thick) or waterproof cementitious board (at least 12mm thick). For added sound absorption that may reduce noise breakout from the closest condenser units the inner skin facing the plant deck could be of perforated steel sheet with a mineral wool absorption layer between the inner and outer skins to a minimum thickness of 60mm. Further detail may be supplied but there are proprietary makes of acoustic enclosure panelling available that would be suitable.

7.5. Care must be taken to ensure that the barrier is well sealed to the side masonry walls and if appropriate the top of the parapet wall so as to form a continuous barrier with no gaps or perforations. However the barrier could be fixed such that it could be removed at a later date with no damage or change to the existing building structure.

#### Extract flue silencer pod

7.6. The level of attenuation required for a post-fan silencer pod in the proposed kitchen extract system is minimal; 8-10dB overall insertion loss will be sufficient to reduce noise breakout to a level that comfortably meets the local authority criteria. Typically a cylindrical silencer of minimum length 800mm should provide suitable reduction in noise breakout from the flue terminal.

7.7. The un-attenuated noise spectrum from the flue terminal is shown to be reasonably broadband in character with no discrete tonal characteristics (see Table 2). The proposed silencer should ensure that the resulting noise spectrum from the terminal also has no discrete tone.

7.8. With the above mitigation in place the plant noise level at the receptor façades will be as Table 5 below.

**Table 5.** Predicted cumulative plant noise impact on receptors  
Following Mitigation Works - dB L<sub>Aeq</sub>

Details	BW10/500	Extract Flue	RP 250	RP 35	RP 140	Chiller
L <sub>Aeq</sub> @ 1m / unit	67	71	59	46	51	65
No. of units	1	1	4*	2	2	2
Distance to façade (m)	12	12	8**	17	10/16	14
Distance correction - dB	-21	-21	-18	-24	-20/-24	-23
Shielding***	-8	-6	0	-10	-5/-10	-5
<b>Additional attenuation from mitigation works above</b>	<b>-5</b>	<b>-8</b>	<b>-10</b>	<b>-5</b>	<b>-8/-5</b>	<b>-5</b>
BS 4142 tonal penalty	+5	0	0	0	0	0
Façade level all units	38	36	37	10	18/12	35
Cumulative level at façade	<b>43</b>					

\* Predicted no of units in operation simultaneously between 05:00 to 08:00

\*\* Closest unit to receptor

\*\*\* Shielding from existing structures on the plant deck to ensure no line of sight

- 7.9. It can be seen that the revised noise impact following the implementation of the mitigation works proposed above, will be 7dB less than originally assessed without mitigation. A noise level of 43dB  $L_{Aeq}$  at the façade of the R1 receptor is 7dB below the quietest measured background noise level and 2dB below the local authority criterion of at least 5dB below background.
- 7.10. It is therefore concluded that the mitigation works described above will be sufficient to meet the local authority planning criteria and no other works should be deemed necessary. It is also important to note that following the installation of the new plant and the mitigation works proposed, the noise environment for the residents facing the light well will be significantly improved over the existing situation during the day from 07:00 when the current plant starts up.
- 7.11. It may be noted that no specific vibration assessment was considered to be necessary. Modern plant generates relatively low levels of structure-borne vibration but is generally by default installed on anti-vibration mountings. These will ensure that any small level of vibration generated by the condenser units is absorbed before it can be transmitted to the building structure. It is therefore considered that as long as resilient mounts are installed structure-borne vibration will not adversely affect the nearest sensitive receptors.
- 7.12. In terms of the consideration of noise generated by customers entering and leaving the premises between the hours of 05:00 to 08:00, as previously stated no objective assessment is possible due to the random nature of human activity and voices. However it may be stated that in the location of the site, the centre of a very busy part of London, with 24-hour road and passing pedestrian traffic, it is deemed highly unlikely that the relatively few customers liable to use the restaurant facilities during the earlier part of the period would be noticeable at any of the local residential receptor properties.
- 7.13. Ambient noise levels in central London rarely dip below 60dB  $L_{Aeq}$  close to major city routes at any time, and the *Defra* noise maps indicate that the average overnight noise level at the Cambridge Circus intersection is between 60dB and 65dB  $L_{Aeq}$ . As a consequence of the high ambient noise levels the activity from customers would need to be extreme to adversely impact on local residents.
- 7.14. Notwithstanding the comments above it is acknowledged that there may be the occasional noisy early morning customer outside the premises. However should such a situation occur it will be the responsibility of the store management to control the situation and curtail noisy activities in the vicinity of the store. It is noted that McDonald's staff is well trained to manage these situations and from experience at other stores appear to do so effectively and diligently.

7.15. In conclusion, it is therefore considered that this assessment demonstrates that if the recommended mitigation measures to control plant noise are implemented the requirements of the local authority noise criteria will be met by the current proposals, and no further noise mitigation measures should be necessary. This document is therefore considered suitable to support a planning application for the variation of Planning Condition 3 of application reference 2014/3237/P to allow opening of the McDonald's store from 05:00 Monday to Saturday.

## APPENDIX 1 Survey, equipment and personnel details

### A1.1 Survey Date:

Tuesday 9<sup>th</sup> to Wednesday 10<sup>th</sup> September 2014

### A1.2 Location:

Cambridge Circus, London WC2H 8AA

### A1.3 Personnel Present:

Martin Loven – Loven Acoustics

### A1.4 Weather:

Dry, wind <1 m s<sup>-1</sup>, 18<sup>o</sup>C.

### A1.5 Instrumentation:

<b>Make</b>	<b>Description</b>	<b>Model</b>	<b>Serial no.</b>
Norsonic	Type 1 Sound Level Meter	NOR131	1310108

All instrumentation conforms to current UK standards and was calibrated before and after use. Calibration is traceable via NAMAS to standards held at NPL.

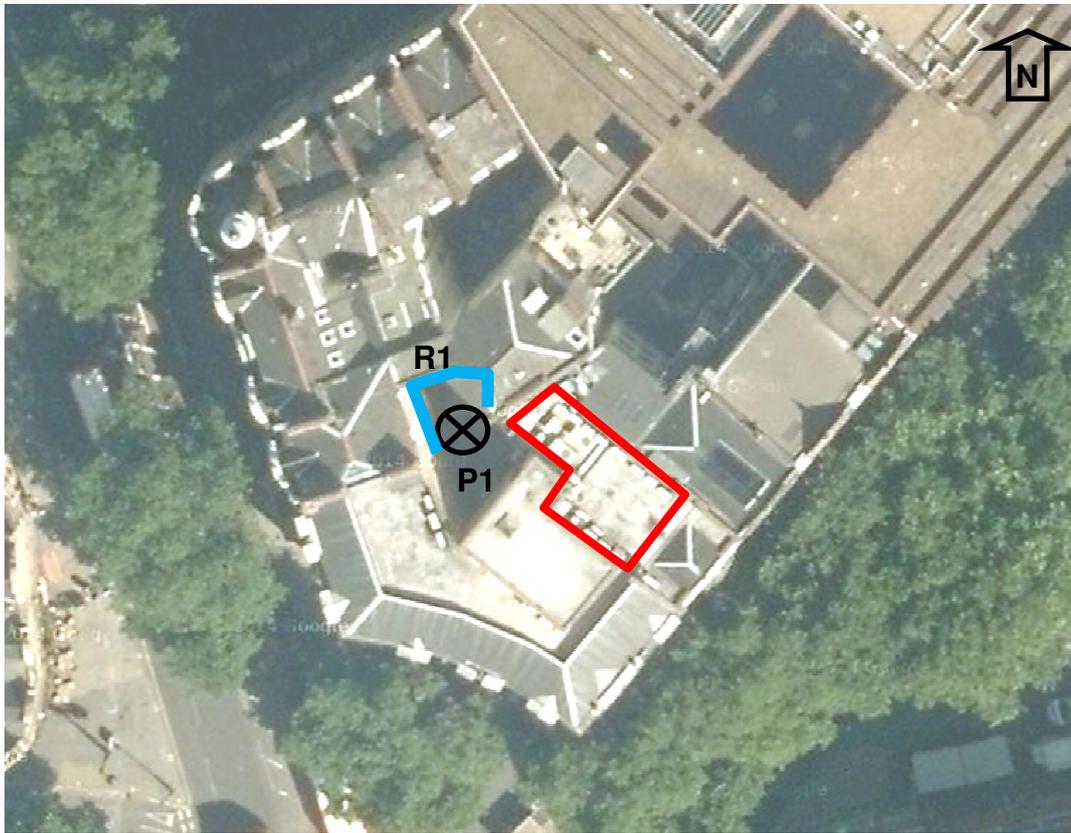
### A1.6 Procedure: See main report

### Explanation of Noise Terms

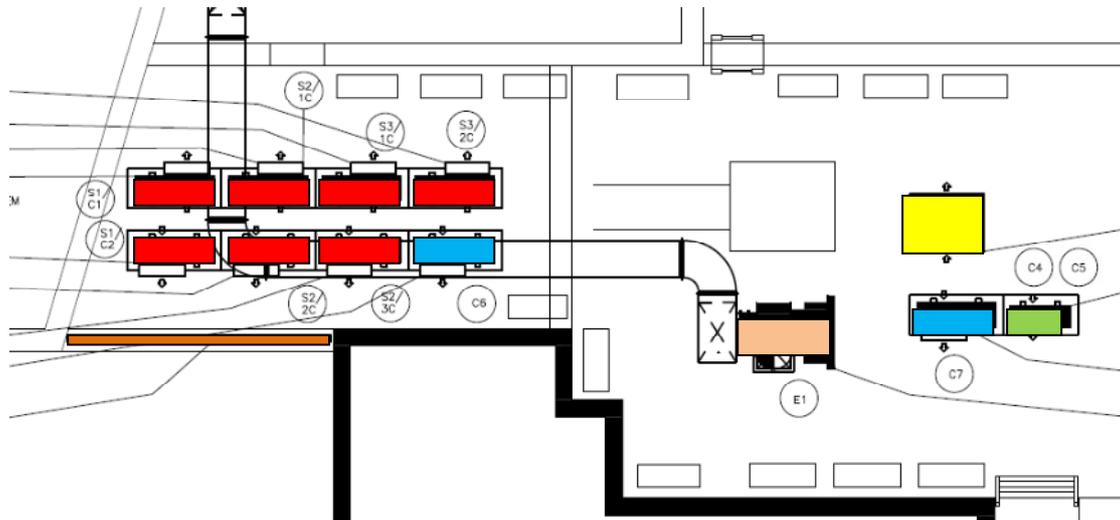
- A2.1 The  $L_{Aeq}$  indicates the average noise level and is the 'equivalent continuous' noise level over a sample period. It is the single parameter now commonly used to describe a noise environment. Most guidance on noise uses ' $L_{Aeq}$ ' to define acceptable levels.
- A2.2 The  $L_{Amax}$  represents the noisiest event affecting the site during each one-hour sampling period.
- A2.4  $L_{A90}$  indicates the noise level exceeded for more than 90% of the time and represents the background noise levels.

**APPENDIX 2**

**Figure 1.** Site location plan showing baseline noise measurement position with location of assessed receptors in light well outlined in blue. Plant deck area outlined in red.



**Figure 2.** Proposed position of external plant units and acoustic barrier



**KEY**

Plant reference	Plant description	Colour code
S1, S2, S3	PHUZ-RP 250	
C4, C5	PUHZ-RP 35	
C6, C7	PUHZ-RP 140	
E1	BW10 500	
	Freezer / chiller cond.	
	Proposed acoustic barrier	

**Figure 3.** Location and height of recommended noise barrier



**Table 6.** Site acquired baseline noise data at P1. Period of proposed extended hours highlighted

Day - date	Time	LAeq	LAmx	LA90
Tuesday 9 <sup>th</sup> September 2014	15:30	64.5	75.7	61.9
	15:45	65.2	68.1	64.5
	16:00	65.1	68.5	64.4
	16:15	64.9	71.1	63.2
	16:30	65.4	71.5	64.7
	16:45	65.0	73.1	64.4
	17:00	64.7	67.4	62.8
	17:15	65.1	68.7	64.5
	17:30	65.1	74.8	63.6
	17:45	64.9	67.9	63.2
	18:00	64.8	71.3	62.7
	18:15	65.2	68.1	64.6
	18:30	64.3	67.8	62.1
	18:45	64.3	70.3	61.7
	19:00	64.7	76.9	61.9
	19:15	64.6	75.6	61.8
	19:30	65.0	74.6	61.7
	19:45	64.8	77.7	61.9
	20:00	64.5	78.2	61.4
	20:15	64.1	67.3	61.6
	20:30	64.0	70.8	61.5
	20:45	63.6	68.8	61.2
	21:00	64.1	67.1	61.7
	21:15	63.6	70.4	61.3
	21:30	64.1	70.7	61.5
	21:45	63.8	67.5	61.4
	22:00	63.8	67.9	61.4
	22:15	64.3	74.6	61.6
	22:30	64.4	72.9	61.8
	22:45	64.5	85.9	61.6
23:00	64.3	74.7	61.8	
23:15	64.4	69.3	61.9	
23:30	64.8	71.7	62.0	
23:45	64.4	70.6	61.9	
Wednesday 10 <sup>th</sup> September 2014	00:00	63.6	69.0	59.5
	00:15	53.0	64.7	51.1
	00:30	52.5	68.0	51.1
	00:45	51.8	62.5	50.6
	01:00	51.6	58.6	50.3
	01:15	51.7	68.0	50.4
	01:30	56.2	73.4	50.7
	01:45	53.2	69.0	50.3
	02:00	51.1	59.7	49.6
	02:15	51.0	55.6	49.9
Continued...				

**Table 6.** Continued...

Day - date	Time	LAeq	LAmx	LA90
Wednesday 10 <sup>th</sup> September 2014	02:30	51.1	63.9	49.9
	02:45	51.5	59.9	50.4
	03:00	51.7	67.4	49.7
	03:15	51.3	67.8	49.6
	03:30	51.3	61.0	49.7
	03:45	51.1	60.5	50.0
	04:00	52.1	65.6	50.5
	04:15	52.5	67.5	50.2
	04:30	52.9	67.5	49.9
	04:45	51.0	63.2	49.7
	05:00	51.8	67.1	50.3
	05:15	51.3	62.2	50.1
	05:30	51.0	58.3	49.8
	05:45	51.0	59.5	49.8
	06:00	52.0	67.9	49.9
	06:15	52.4	67.5	50.3
	06:30	58.3	77.6	51.2
	06:45	56.5	69.2	52.0
	07:00	58.9	73.4	52.8
	07:15	59.1	71.4	57.5
	07:30	59.0	68.7	57.6
	07:45	63.9	70.6	61.8
	08:00	64.6	69.6	62.1
	08:15	64.4	68.7	62.0
	08:30	65.8	76.2	63.0
	08:45	65.5	71.9	62.8
	09:00	66.3	78.9	62.9
	09:15	64.5	73.8	62.6
	09:30	65.2	73.6	62.8
	09:45	65.1	71.7	62.8
10:00	64.8	69.7	62.7	
10:15	65.2	71.5	62.7	
10:30	65.1	72.3	62.1	
10:45	64.7	69.5	62.6	
11:00	64.4	70.0	62.2	
11:15	64.9	75.9	62.7	
11:30	64.0	75.2	62.1	
11:45	64.5	78.0	62.1	
12:00	65.3	73.6	64.2	
12:15	63.8	65.9	63.1	
12:30	64.6	68.9	63.3	
12:45	65.2	72.5	63.5	
13:00	66.5	78.4	64.4	
13:15	66.2	77.7	63.8	