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Acoustic Consultancy Report

Environmental Noise Survey Report and Noise Impact Assessment for Fixed Plant

Asda Thurnscoe

Client:	Asda Stores Ltd
Project:	Asda Store Welfare Road Thurnscoe S63 0JZ
Our Ref:	10821
Revision:	B
Report Prepared By	N. Fowler M.I.O.A.
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EXECUTIVE SUMMARY

Acoustic Consultancy Partnership Ltd have been appointed to undertake an environmental noise survey and complete a noise impact assessment for the proposed additional fixed plant at the Asda, Welfare Road, Thurnscoe store.

Section A - General

The assessment has established the predicted plant noise levels at the nearest and most affected property, namely the bungalow immediately to the west of the store and near to the boundary wall, approximately 16m from the proposed plant location and with partial line of sight through a non-acoustic fence.

Full details of the noise impact assessment is given in Section C within the report and briefly summarised below.

Section B – Environmental Monitoring

We have undertaken environmental noise monitoring in Kingsway Grove adjacent to the front façade of the bungalow at the rear of the store. Weekday evening and night time measurements were obtained.

Section C – Plant

We are not aware of any planning condition relating to plant noise for this site. We have therefore recommended a noise criteria at the receptor position based on the methodology given in BS4142:2014.

The un-attenuated plant rating level exceeds the typical background sound level at the receptor position for any periods of operation.

Taking into account the excess of the rating level above the background sound level, we conclude the overall impact of the operation of the new plant for 24 hours a day, 7 days a week would require mitigation measures.

Providing the mitigation measures detailed in section 16.0 of this report are adopted, the plant rating noise level at the nearest, most affected property would not exceed the typical background noise levels and the overall impact of the new plant for 24 hours a day, 7 days a week operation would be low impact.

This would be acceptable in accordance with BS 4141:2014.

SECTION A - GENERAL

1.0 Introduction

1.1 Acoustic Consultancy Partnership Ltd have been appointed to undertake an environmental noise survey and complete a noise impact assessment for the proposed additional fixed plant at the Asda Thurnscoe store.

1.2 We have undertaken environmental noise monitoring in Kingsway Grove representative to the bungalow at the rear of the store which will have partial line of sight to the proposed new plant and is the nearest, most affected property. Weekday evening and night time measurements were obtained.

1.3 A noise impact assessment has been completed, in accordance with the methodology given in BS4142:2014 and based on the measured existing $L_{A90,T}$ background noise levels.

1.4 Technical terms or references are occasionally used within this report. To assist the reader, a Glossary of Terminology is included in Appendix 3.

2.0 Site Layout and Nearest Noise Sensitive Receptors

2.1 The existing Asda store is located on the southern side of the B6411 Houghton Road and is located to the rear of “The Thurnscoe” Public House which is unoccupied. The store car park is located on the northern and eastern sides of the site accessed from Welfare Road. The delivery yard is at the southern end of the store.

2.2 Immediately to the south of the store is a row of terraced houses. To the west of the store, and in close proximity, is a bungalow. To the east, on the far side of Welfare Road, are flats fronting Houghton Road. To the north side of Houghton Road, opposite the Public House, is a row of two storey terraced properties.

2.3 At present, the existing plant is located at ground level on a narrow strip of land on the western elevation of the store. It is proposed that one new refrigeration condensing unit will be positioned to the north of the existing units and adjacent to the existing concrete ramp.

2.4 The closest, and most affected, residential property is the bungalow immediately to the west of the store and approximately 16m from the proposed plant location. There is a wooden fence between the plant and the bungalow that will provide some shielding to the windows of the property and we have allowed a 5dBA barrier loss.

2.5 Other dwellings are positioned to all sides of the store, but are at an increased distance or more shielded from the proposed plant location.

3.0 Receptor Position

3.1 For the plant noise impact assessment, we have selected a receptor position as detailed below.

Receptor Position RPA Bungalow fronting Kingsway Grove.

4.0 Project Information

4.1 Our noise impact assessment is based on the current plant drawings and plant noise data provided by CBES Ltd.

SECTION B – ENVIRONMENTAL MONITORING

5.0 Environmental Noise Monitoring Location

5.1 To determine the existing $L_{A90,T}$ background and $L_{Aeq,T}$ ambient noise levels of the surrounding area, one monitoring position was adopted as below.

Monitoring Position MP1 In Kingsway Grove adjacent to the bungalow.

5.2 The results obtained were considered typical of the existing noise climate applicable to the most affected noise sensitive receptor.

5.3 The monitoring position is indicated on the site layout given in Appendix 2.

6.0 Noise Monitoring Period and Survey Weather Conditions

6.1 The noise monitoring periods were as follows.

Late evening 21.25 to 22.10 hours on Tuesday 24th February 2015.

Night Time 01.00 and 01.45 hours on Wednesday 25th February 2015.

6.2 The weather during both survey periods was dry with clear skies and a light wind. The wind speed measured with a Meteos anemometer was 0.3m/s at the start and 0.2m/s at the end of the surveys.

6.3 Conditions were acceptable for environmental monitoring during both periods.

7.0 Monitoring Equipment

7.1 The noise monitoring equipment comprised of a Svantek 957 type 1 real time analyser, serial no 21434, with a weatherproof microphone protection system.

7.2 The meter calibration was verified before and after the measurement period, using a Svantek SV31 acoustic calibrator, serial number 24687. Any deviation was within an acceptable tolerance.

7.3 This meter and calibrator have current calibration certificates, available upon request.

8.0 Noise Measurement Parameters

8.1 The environmental survey established the prevailing L_{AFmax}, $L_{Aeq,T}$, $L_{A10,T}$ and $L_{A90,T}$ noise levels measured using an "F" time weighting with a 15 minute reference time period.

8.2 A Glossary of Terminology is given in Appendix 3.

9.0 Monitoring Results and Observations

9.1 We believe the recorded environmental noise measurements are representative of the existing noise climate levels applicable to the most affected noise sensitive receptor.

9.2 BS4142:2014 states "In using the background sound level in the method for rating and assessing industrial and commercial sound it is important to ensure that values are reliable and suitably represent both the particular circumstances and periods of interest. For this purpose, the objective is not simply to ascertain a lowest measured background sound level, but rather to quantify what is typical during particular time periods"

Furthermore BS4142:2014 states "There can be variability in the derivation of statistical parameters, so use integers when expressing the background sound level. A background sound level expressed to a precision of one decimal place implies incorrectly that the background sound level is exactly that value. Rounding is to be done on the basis that a value of 0.5 is rounded up."

9.3 The typical measured background noise levels assessed in accordance with BS4142:2014 and applicable to the operating periods of the plant are given below. A full set of measurements are provided in Appendix 1.

Receptor Position	Period	Typical Measured Background Noise Level dB $L_{A90(15min)}$
RPA	07.00-23.00	38
	23.00-07.00	30

Table 1 – Typical Measured Background Noise Level

9.4 During the survey periods car activity on the surrounding roads was very light with one car movement past the monitoring position during the evening survey and no cars past the monitoring position at night. There was one aircraft flyover during the evening period. No store plant was audible at the monitoring position.

SECTION C – FIXED PLANT

10.0 Proposed Hours of Operation

10.1 We understand the new plant item would operate on demand, 24hrs a day, 7 days a week with night set back for reduced fan speed.

11.0 Plant Noise Criteria

11.1 The new condensing unit is to be installed at ground level on a narrow strip of land on the western elevation of the store and to the north of the existing plant. In section 2.0 of this report we have confirmed there will be partial line of sight protection to the bungalow due to the existing wooden fence. We have allowed a nominal 5dBA barrier loss.

11.2 During the day (07.00-23.00), the British Standard requires the rating sound level to be established over a 1 hour reference time period and to be compared to the typical existing background sound level. During the night (23.00-07.00), the British Standard requires the rating sound level to be established over a 15minute time period and compared to the typical existing background sound level.

11.3 For our assessment we have assumed that the unit could run continuously during any day or night reference time periods.

11.4 In accordance with BS4142:2014, a +3dB acoustic correction has been applied to the plant operation for “other sound characteristics”.

11.5 Also, in accordance with BS4142:2014, we have taken the typical background sound level for each of the assessment periods.

12.0 Calculation Procedure

12.1 Calculations are based on our Excel programmes which provide the individual plant item noise levels at the receptor position. The calculations are based on standard methodology and take into account the distance correction and the barrier effects, where appropriate, of screens and any buildings.

13.0 Plant Noise Data

13.1 The manufacturers noise data used within this assessment is given below.

Plant Item	Sound Pressure level, dB
Hubbard HTS060	47 dBA at 10m day 41 dBA at 10m night

Table 2 – Plant Sound Pressure Levels

14.0 Un-attenuated Plant Noise Level

14.1 We have completed a calculation of the proposed **un-attenuated** total plant noise level at the facade of nearest residential property, based on the plant noise levels detailed above. The cumulative plant rating noise levels at the selected receptor position are given below, together with the excess of rating level above background.

Receptor Position	Time Period	New Plant Rating Sound Level, dBA	Typical Background Sound Level, L_{A90T}	Excess of Rating Level above Background
RPA	07.00-23.00	44	38	+6
	23.00-07.00	38	30	+8

Table 3 – Plant Rating Level, Typical Background Sound Level and Resulting Excess

14.2 We consider the level of uncertainty of the measurements and assessment to be low and have no significant influence on the outcome of the assessment. The plant noise levels have been provided by the manufacturers for day and night operation and background sound levels were recorded adjacent to the receptor position during a period of good weather conditions.

15.0 Fixed Plant Conclusions

15.1 The plant rating level exceeds the typical background sound level at the receptor position for any periods of operation.

15.2 BS 4142:2014 provides the following guidance on obtaining an initial estimate of the impact of the specific sound, based on the excess of the rating level above the background sound level.

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

15.3 BS4142:2014 also requires context to be taken into account. For this site, traffic activity on the road network was light during both survey periods and a 5dB barrier loss has been included in our calculations for the existing fence at the site boundary.

15.4 Taking into account the excess of the rating level above the background sound level, we conclude the overall impact of the operation of the new plant for 24 hours a day, 7 days a week would require mitigation measures.

16.0 Mitigation Measures

16.1 It should be noted that a 5dBA barrier loss has been included within our calculation and the introduction of a new screen around the plant, together with acoustic lining on the wall of the store behind the unit would be required.

16.2 The screen would be two sided on the west and south sides of the new unit. The south facing side would terminate at the existing concrete ramp and the west facing side would terminate at least 1m beyond the northern face of the unit.

The acoustic fence is to be timber construction comprising 18mm thick boards, butt jointed with a bottom gravel board so there is no gap between the bottom of the fence and the ground. There are to be 50x25 capping sections covering all joints between the boards so there are no gaps. The post construction to be timber or metal depending on the finalised height of the fence and closure strips to be provided where boards join the posts to prevent gaps.

The fence height to be determined on site (provisionally 2.1m) but is to be of sufficient height to provide full line of sight protection from the top of the highest unit to 300mm above the top of the bungalow windows.

The external face of the store wall adjacent to the existing concrete ramp is to be lined with 100mm thick acoustic wall lining panels constructed from 100mm thick 45kg/m^3 rockwall slab infill material retained by fibreglass tissue faced 0.8mm thick 35% free area expanded metal. The top of the lining should terminate at a position at least 500mm above the top of the unit and the overall width of the lining should extend from the external door to a position 1m beyond the unit and level with the end of the screen.

The infill is to be inert, non-hygroscopic, rot proof, vermin proof and have Class 1 rating for spread of flame. It is to be bagged with “Melinex sheet” and all joints sealed to prevent water ingress to the rockwall slabs.

16.3 The resultant plant level, with a two sided screen and wall lining, would be as follows:

Receptor Position	Time Period	New Plant Rating Sound Level, dBA	Typical Background Sound Level, L_{A90T}	Excess of Rating Level above Background
RPA	07.00-23.00	34	38	Nil
	23.00-07.00	28	30	Nil

Table 4 – Plant Rating Level, Typical Background Sound Level and Resulting Excess

16.4 The plant rating level, with mitigation measures, would not exceed the typical background level during the day or night.

17.0 Conclusions

17.1 Providing the mitigation measures detailed in section 16.0 are adopted, the plant rating noise level at the nearest, most affected property would not exceed the typical background noise levels and the overall impact of the operation of the new plant for 24 hours a day, 7 days a week would be low impact.

17.2 This would be acceptable in accordance with BS 4141:2014.

Appendix 1

Environmental Monitoring Results

MP1

Time			Measured Sound Pressure Level, dB			
			L_{AFmax}	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
21.25	to	21.40	58.0	43.9	46.2	38.8
21.40	to	21.55	56.2	41.9	44.8	37.7
21.55	to	22.10	58.6	44.0	46.5	38.1

Time			Measured Sound Pressure Level, dB			
			L_{AFmax}	$L_{Aeq,T}$	$L_{A10,T}$	$L_{A90,T}$
01.00	to	01.15	54.8	35.0	36.6	29.7
01.15	to	01.30	50.0	35.8	37.5	30.2
01.30	to	01.45	47.4	36.1	38.0	31.6

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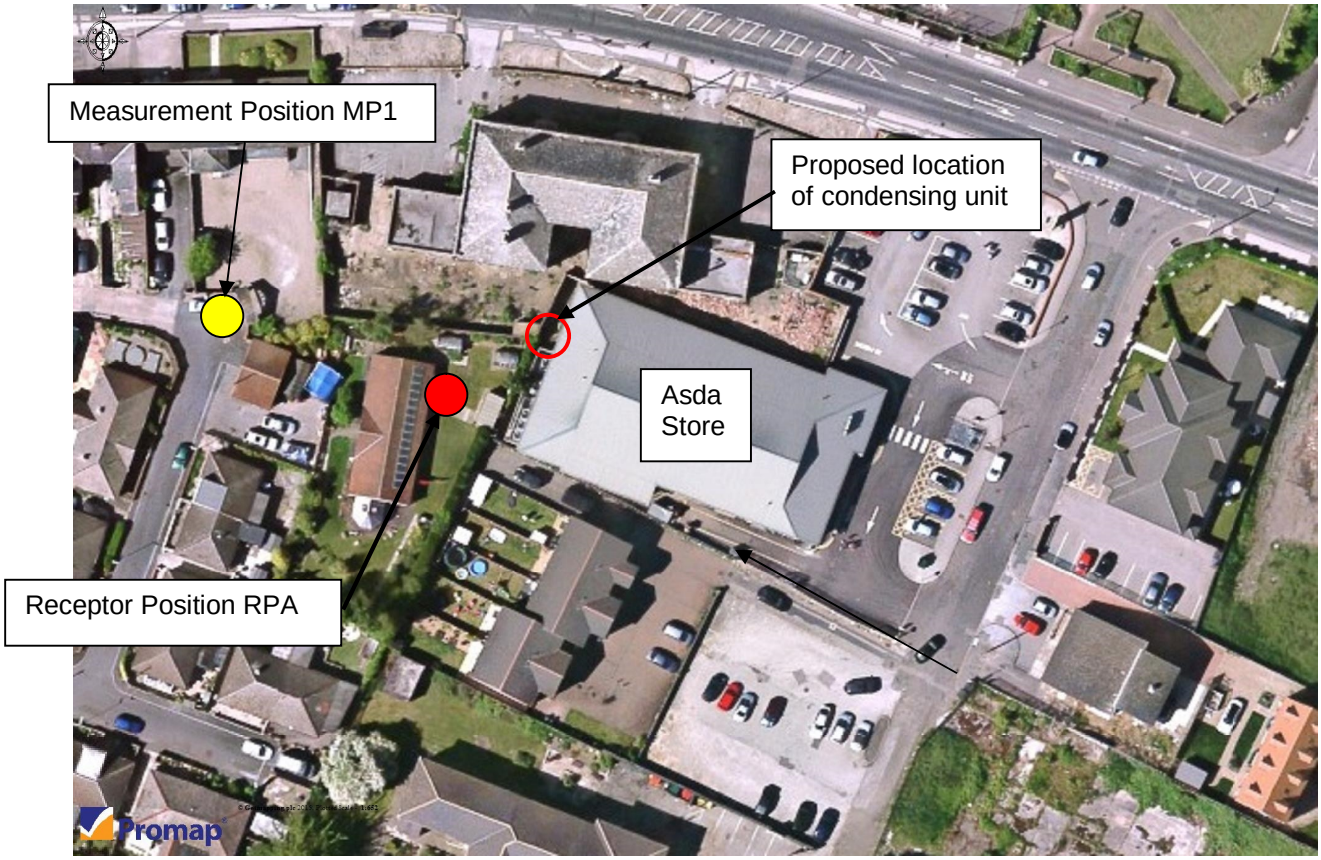
Appendix 2

Site Plan



Appendix 3

Glossary of Terminology

$L_{Aeq,T}$

The $L_{Aeq,T}$ is defined as the equivalent continuous sound pressure level, over the reference time period "T". It can be considered as an average of the total sound energy, or the steady continuous level that has the same total energy as a fluctuating sound source.

$L_{A90,T}$

The $L_{A90,T}$ is a statistical parameter, defined as the sound pressure level exceeded for 90% of the measurement time period "T". It is used by BS4142:1997 to characterise the "background noise Level" and can be considered in simple terms as the noise level in the quieter spells eg between passing traffic.

$L_{A10,T}$

The $L_{A10,T}$ is a statistical parameter, defined as the sound pressure level exceeded for 10% of the measurement time period "T". It is commonly used to measure road traffic noise. In simple terms, it is a measurement of the noisier spells eg when traffic is passing.

L_{AFmax}

The L_{AFmax} is the maximum measured sound pressure level in a given measurement period.

Appendix 4

Noise Impact Assessment Methodology

We give below a summary of the various British Standards and other published documents that provide guidance on noise impact assessment methodology and noise criteria that can be considered relevant to store plant noise.

BS 4142:2014 Methods for Rating and Assessing Industrial and Commercial Sound

This British Standard describes methods for rating and assessing sound of an industrial and/or commercial nature, which includes

a) Sound from industrial and manufacturing processes
b) Sound from fixed installations which comprise mechanical and electrical plant and equipment
c) Sound from the loading and unloading of goods and materials at industrial and/or commercial premises
d) Sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes

The methods described in the British Standard use outdoor sound levels to assess the likely effects of sound on people who might be inside or outside a dwelling or premises used for residential purposes upon which sound is incident.

The Standard confirms that certain acoustic features can increase the significance of impact over that expected from a basic comparison between the specific sound level and the background sound level. Where appropriate, a rating penalty should be established based on a subjective assessment of its characteristics at the receptor position. This method is appropriate where a new source cannot be measured because it is only proposed at that time, but the characteristics of similar sources can subjectively be assessed.

National Planning Policy Framework (NPPF)

The NPPF was published on 27th March 2012 and replaces the existing planning framework – which consisted of Planning Policy Guidance and Statements (PPGs and PPS).

The NPPF reflects previous planning guidance, and promotes sustainable economic development. As such the NPPF states that *"planning should operate to encourage and not act as an impediment to sustainable growth. Therefore significant weight should be placed on the need to support economic growth through the planning system".*

Whilst not providing any specific guidance on assessment methodology, this document confirms in section 123 that 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."* Furthermore they should aim to *"mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions".*

The aims of section 123 are to be read in conjunction with the Explanatory Note to the Noise Policy Statement for England (Department for the Environment, Food and Rural Affairs). Again, this document does not provide any specific guidance on assessment methodology.