KR03427

CONFIDENTIAL

Deansgate, Manchester

Former Staples Store
118 Deansgate
Manchester
M3 2GQ

Technical Note

Environmental Noise Review

19th May 2014

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1. INTRODUCTION

1.1. Instruction

This Technical Note forms an addendum to the Environmental Noise Impact Assessment KR3427 V1.5 dated 30th April 2014 [The Assessment]. The Assessment sets out an environmental noise impact assessment in respect of 118 Deansgate, Manchester [The Site]. The purpose of this Technical Note is to address comments made by the local authority Environmental Health department in respect of delivery noise at The Site.

1.2. Environmental Health Comments

"Environmental Health have concerns regarding noise disamenity from the delivery vehicles in the early hours of the morning, and particularly on weekend mornings when the background noise levels will be lower. Due to the hours restriction on the loading bay at the rear of the site and use of the bus stop at the front, the premises does not have a provision for deliveries from 7am to 8am, therefore it may be expected that there will be more deliveries between 6am and 7am. The report has used computer modelling to predict the noise levels at the residential but it is not clear where the figures have been derived from.

Measurement data for each element of noise from a delivery have been used to calculate the impact on the residential apartments at the site. However this data has only been shown in graphical form and there are no $L_{Aeq,t}$ *, or* L_{Amax} *(and frequency of max occurrences) during the half hour delivery period or each noise event of the delivery given at 1 metre from the source.*

It is not clear from the report which are the nearest residential apartments have been used, as the report states 1m from the residential at the rear of the store but there is no mention regarding deliveries to the front of the store on Deansgate or how far (metres) the nearest residential properties are.

Additionally there are no predicted background noise levels for Sunday mornings when the background noise levels would be at their lowest and likely to cause the most noise disamenity."

2. Delivery Noise

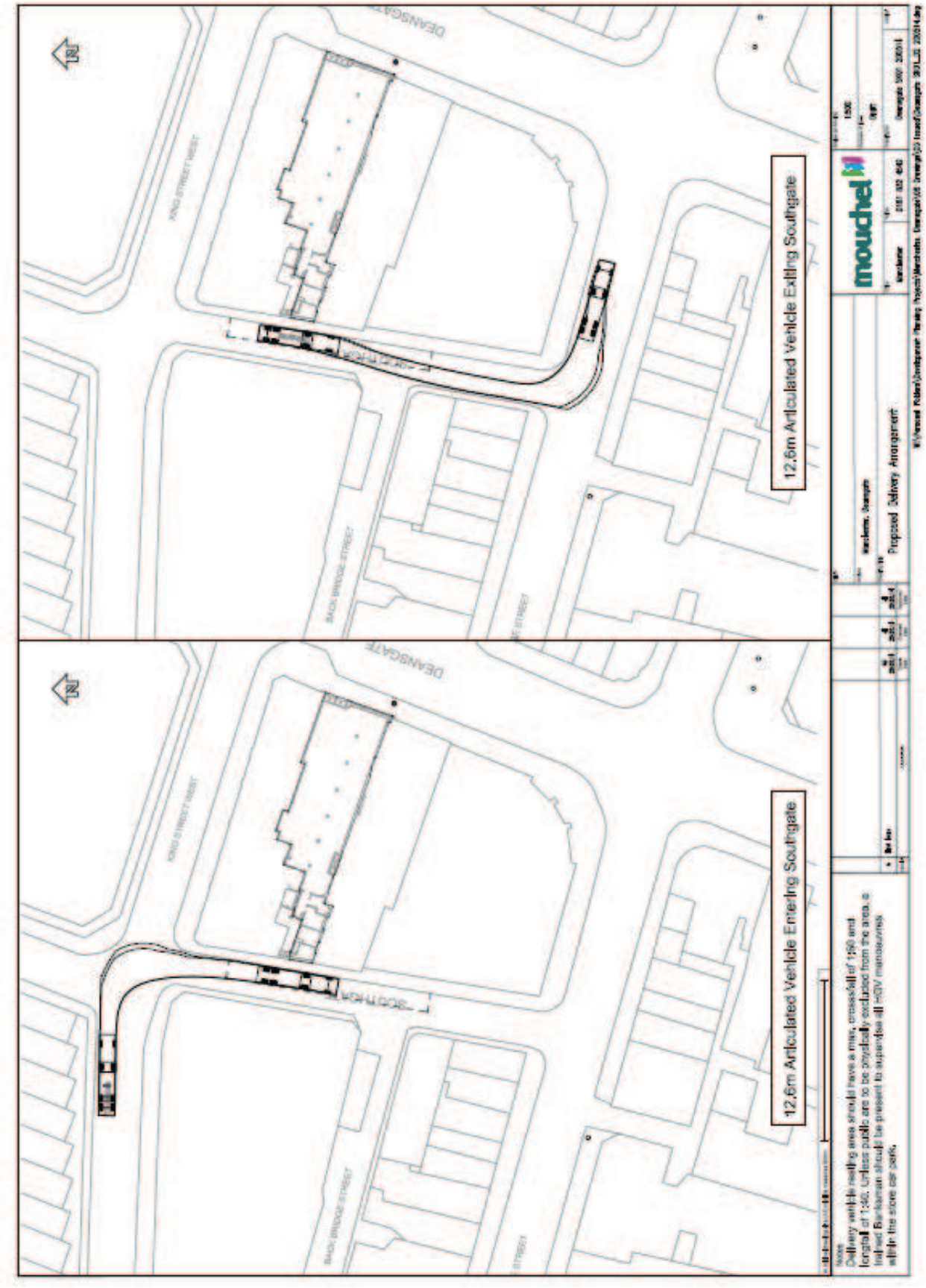
2.1. Guidance

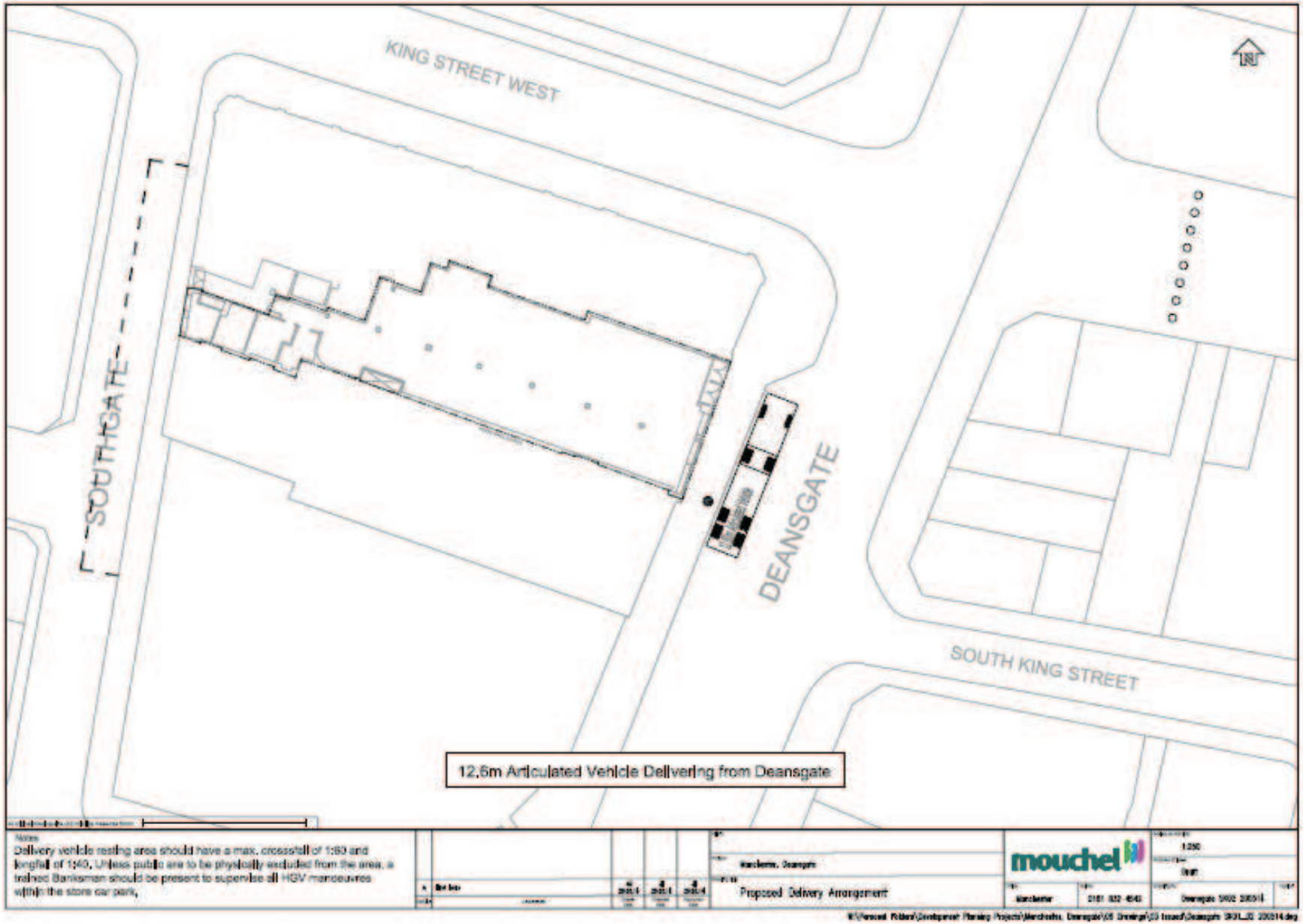
There is little specific guidance in respect of the potential nuisance caused by deliveries to commercial (etc.) premises close to residential dwellings, however “Delivering the Goods” published by the Department for Transport outlines a method for assessing the impact of deliveries to commercial properties on nearby residential properties.

The general approach is very similar to the method outline in British Standard 4142:1997 as it compares the noise from deliveries (typically ‘average’ L_{Aeq}, T and maximum L_{Amax}) to the underlying background noise levels.

2.1. Locations

2.1.1 Supplied Drawings




KING STREET WEST
SOUTHGATE
DEANSGATE
SOUTH KING STREET
12.6m Articulated Vehicle Delivering from Deansgate
Notes
Delivery vehicle resting area should have a max. crossfall of 1:80 and longfall of 1:40. Unless public are to be physically excluded from the area, a trained Banksman should be present to supervise all HGV manoeuvres within the store car park.
Proposed Delivery Arrangement
mouchel

2.1.2 Deansgate



2.1.3 Southgate



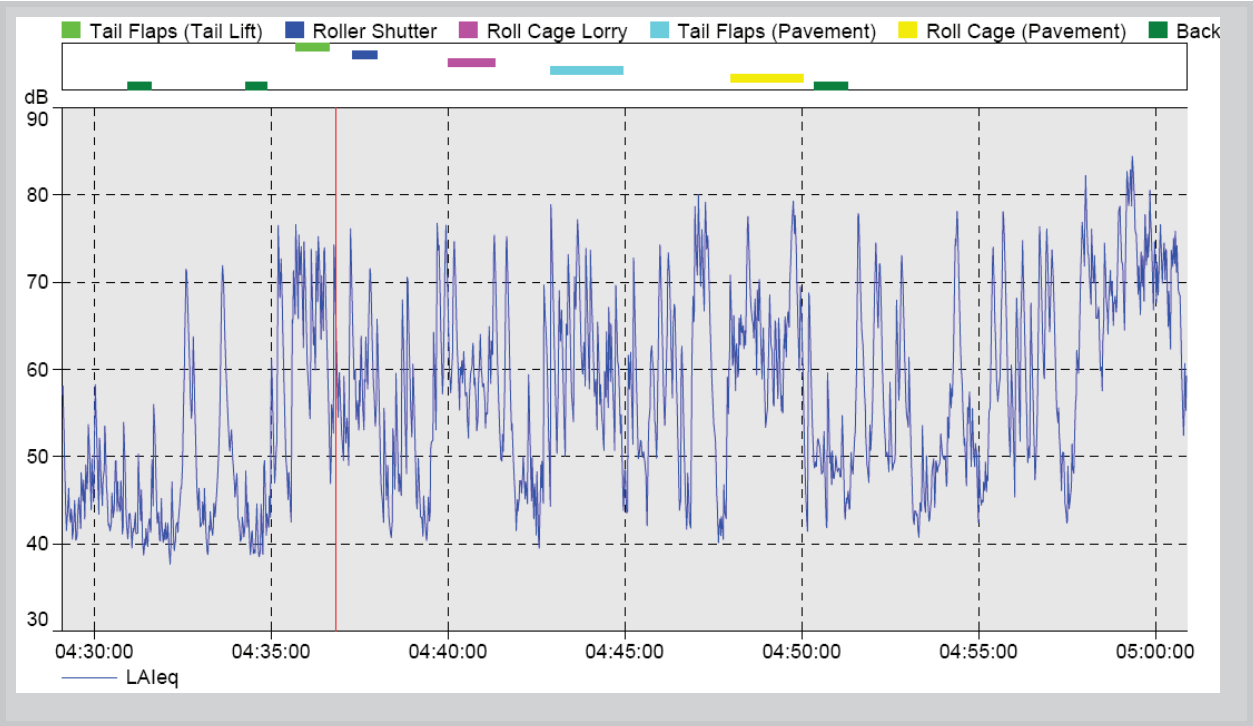
2.2. Measurements

To establish a baseline for the noise typically generated by a delivery to a convenience store, measurements were taken of a delivery using the largest of the vehicle types likely to affect deliveries (a 40ft standard articulated lorry was used).



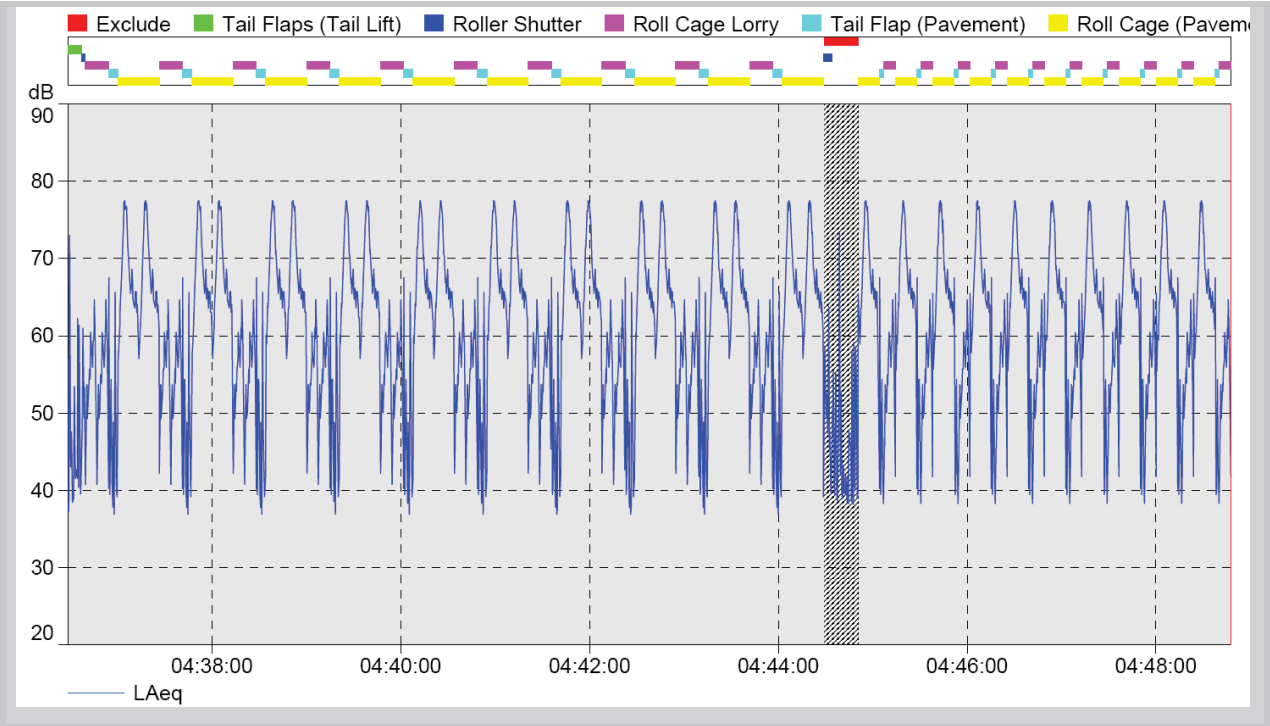
Measurements at ~1m from the individual delivery activities

2.2.1 Resultant Noise Levels



Levels measured over the period

2.2.2 Simulated Delivery Noise Results



Levels of various delivery activities (less background levels)

2.2.3 Measured Levels

Index	Level
L_{Aeq}	$L_{Aeq, 30min}$ 58 dB at 1m ref 1 x 10^{-5} Pa
L_{AMax}	L_{AMax} 78 dB at 1m ref 1 x 10^{-5} Pa
L_{AMax} occurrence	L_{AMax} events occur on 'impacts'. ie. Dropping the tail lift flaps and the rapid transit of roll cages. This can occur a number of times during a delivery, however this can and should be minimised by implementing a delivery management plan (see Recommendations).

2.3. Distances

It is understood that the upper stories of the building are residential dwellings which puts them directly above the vehicles making the deliveries. Although the distance from the nearest residential windows to the various aspects of deliveries will vary, this assessment has taken the view that a distance of 4m is reasonable when considering the immediate activity.

2.4. Predicted Levels

Index	Level at Nearest Residential Facade
L_{Aeq}	$L_{Aeq, 30min}$ 46 dB at 1m ref 1 x 10^{-5} Pa
L_{AMax}	L_{AMax} 66 dB at 1m ref 1 x 10^{-5} Pa

Given the geometric divergence of the sound from the delivery activity, the above levels are assumed to be a reasonable assessment of the sound from the deliveries at the nearest residential windows at both delivery locations.

3. ASSESSMENTS

3.1. Deansgate 06:00 – 07:00

Delivery Noise Delivering the Goods Department for Transport Guidance			
Source	Operating Times		Source Position
12m Articulated Lorry	06:00 to 07:00		½ hour delivery to side of store
Assessment Position	1m from the residential properties above the delivery location		
Background Position	At the assessment position		
Distance	4m		
Item	Average	Maximum	Commentary
Source Levels At Assessment Position	46 dB	66 dB	Calculated from the indicative tests of delivery noise
Background Levels At Assessment Position	54 dB	92 dB	Corrected to the assessment position
Assessment Level	-8 dB	-26 dB	Difference between source and existing noise levels. ($L_{Aeq} – L_{A90}$)
Conclusion	**There is unlikely to be a negative impact from deliveries**		
Test Laboratory:	4193		
Report Reference:	KR03427 / 01		
Test Date:	09:00 on 10th October 2013 to 07:00 on 11th October 2013		
Approval Date:	21st May 2014		

It should be noted that the measured maximum in the table above is the maximum noise level measured within the hour stated. Although levels of this magnitude will help to mask maximum noise events during deliveries, active steps should be taken to minimise 'bangs', 'crashes' and other impact noise.

The background levels taken for the purposes of this assessment were taken on a Thursday and Friday. It should be noted that due to shops opening later, noise levels early on Sunday mornings will be lower than those shown above. It is anticipated however that average noise levels will still not exceed background levels even on 'quieter' days.

Delivery Noise

Delivering the Goods

Department for Transport Guidance

Source	Operating Times		Source Position
12m Articulated Lorry	19:00 – 22:00		½ hour delivery to side of store
Assessment Position	1m from the residential properties above the delivery location		
Background Position	At the assessment position		
Distance	4m		
Item	Average	Maximum	Commentary
Source Levels At Assessment Position	46 dB	66 dB	Calculated from the indicative tests of delivery noise
Background Levels At Assessment Position	52 dB	86 dB	Corrected to the assessment position
Assessment Level	-6 dB	-20 dB	Difference between source and existing noise levels. ($L_{Aeq} – L_{A90}$)
Conclusion	**There is unlikely to be a negative impact from deliveries**		
Test Laboratory:	4193		
Report Reference:	KR03427 / 02		
Test Date:	09:00 on 10th October 2013 to 07:00 on 11th October 2013		
Approval Date:	21st May 2014		

It should be noted that the measured maximum in the table above is the maximum noise level measured within the hours stated. Although levels of this magnitude will help to mask maximum noise events during deliveries, active steps should be taken to minimise 'bangs', 'crashes' and other impact noise.

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Delivery Noise

Delivering the Goods

Department for Transport Guidance

Source	Operating Times		Source Position
12m Articulated Lorry	08:00 – 20:00		½ hour delivery to side of store
Assessment Position	1m from the residential properties above the delivery location		
Background Position	At the assessment position		
Distance	4m		
Item	Average	Maximum	Commentary
Source Levels At Assessment Position	46 dB	66 dB	Calculated from the indicative tests of delivery noise
Background Levels At Assessment Position	56 dB	87 dB	Corrected to the assessment position
Assessment Level	-10 dB	-21 dB	Difference between source and existing noise levels. ($L_{Aeq} – L_{A90}$)
Conclusion	**There is unlikely to be a negative impact from deliveries**		
Test Laboratory:	4193		
Report Reference:	KR03427 / 03		
Test Date:	09:00 on 10th October 2013 to 07:00 on 11th October 2013		
Approval Date:	21st May 2014		

It should be noted that the measured maximum in the table above is the maximum noise level measured within the hours stated. Although levels of this magnitude will help to mask maximum noise events during deliveries, active steps should be taken to minimise 'bangs', 'crashes' and other impact noise.

The background levels taken for the purposes of this assessment were taken on a Thursday and Friday. It should be noted that due to shops opening later, noise levels early on Sunday mornings will be lower than those shown above. It is anticipated however that average noise levels will still not exceed background levels even on 'quieter' days.

4. Recommendations and Conclusions

4.1. Recommendations

Whilst it is reasonable to assume that anyone living directly above a commercial store in a busy shopping area will expect a certain degree of related noise, they can and should also expect that it will not be excessive or disruptive, especially in the early morning or late evening.

The 'average' noise levels predicted should not cause an unreasonable disturbance, even on quieter days (ie. Sundays). However, although maximum noise levels from the deliveries will be largely masked by the levels of maximum noise events in the area, it can never be assumed that this will always be the case. It is therefore recommended that the store maintains a strict 'minimum noise' policy for deliveries especially at 'sensitive times' with particular emphasis on not causing unnecessary 'impact' noise during deliveries.

The following has already been recommended as part of the store transport assessment:

> *"Deliveries to the front door: 6am – 7am & 7pm – 10pm only. Back Door 8am – 8pm only.*
>
> *No delivery vehicles allowed outside these times. Driver to level vehicle prior to offloading using tractor and trailer air suspension. Two trained store staff to offload all tail lift deliveries.*
>
> *Driver to split down heavy cages prior to offloading if requested by store staff. All available deliveries must collect return equipment. Keep noise to a minimum at all times".*
>
> *"Noise sensitive area: Fridge motors/radios and reverse bleepers must be turned off on arrival and throughout the delivery. Engines to be turned off while waiting and throughout the delivery."*

4.2. Conclusions

Given the predicted average and maximum noise levels at the most sensitive residential facades and the background levels likely to prevail, it is concluded that deliveries during the times and at the locations stipulated, will not cause undue disturbance to local residents.

5. APPENDIX A - BACKGROUND NOISE LEVELS

5.1. 07:00 Thursday 10th October to 07:00 Friday 11th October

Time Period	L_{Max}	Minimum 5 minute			1 Hour			Day and Night		
		$L_{Aeq,5\ min}$	$L_{A10,\ 5\ min}$	$L_{A90,\ 5\ min}$	$L_{Aeq,\ 1\ hour}$	$L_{A10,\ 1\ hour}$	$L_{A90,\ 1\ hour}$	$L_{Aeq,\ t}$	$L_{A10,\ t}$	$L_{A90,\ 16hours}$
07:00 – 08:00	91.4	72.6	74.9	62.9	71.8	74.3	62.9	74.52	78.1	59.6
08:00 – 09:00	94.9	74.3	75.2	60.2	72.8	74.3	63.7			
09:00 – 10:00	93.5	73.2	75.5	61.2	74.7	76.7	64.8			
10:00 – 11:00	95.7	73.6	76.1	56.4	74.9	76.9	61.3			
11:00 – 12:00	98.9	73.0	75.4	58.9	74.8	76.5	62.8			
12:00 – 13:00	89.2	71.0	73.6	58.7	74.1	76.1	64.3			
13:00 – 14:00	95.4	71.3	74.0	63.2	73.1	75.1	64.4			
14:00 – 15:00	88.8	70.4	73.0	60.0	72.3	74.7	63.0			
15:00 – 16:00	99.8	71.4	73.9	60.7	77.1	75.7	63.5			
16:00 – 17:00	87.5	70.3	73.5	61.0	72.4	74.9	63.1			
17:00 – 18:00	95.1	70.3	71.8	61.2	72.5	74.8	63.1			
18:00 – 19:00	99.4	70.5	73.5	59.9	73.9	74.7	62.6			
19:00 – 20:00	90.2	70.0	72.4	63.1	72.0	74.1	64.9			
20:00 – 21:00	99.4	71.5	73.9	54.4	76.2	76.9	62.1			
21:00 – 22:00	86.9	74.8	76.8	52.3	75.7	77.8	57.8			
22:00 – 23:00	99.2	75.3	77.3	58.4	76.8	78.1	61.0			
23:00 – 00:00	94.4	75.4	77.9	55.4	76.5	78.6	61.0	75.1	78.5	52.6
00:00 – 01:00	87.6	74.7	77.3	52.3	75.5	78.2	55.4			
01:00 – 02:00	89.8	71.9	75.8	44.1	74.1	77.8	50.7			
02:00 – 03:00	92.6	70.6	74.4	42.5	73.1	77.1	46.2			
03:00 – 04:00	91.8	71.6	75.5	43.4	73.0	76.9	48.5			
04:00 – 05:00	90.5	70.7	74.6	46.3	73.3	77.4	51.8			
05:00 – 06:00	87.9	74.6	78.4	53.7	75.6	79.5	55.7			
06:00 – 07:00	92.0	75.7	79.2	54.6	77.4	80.1	59.9			

Sound Pressure Levels, dB. Reference level of 2×10^{-5} Nm^{-2}