sharps acoustics

Big Yellow, Staples Corner

Assessment of noise impact from proposed self-storage facility and flexible office space

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17th November 2023

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Appendices

1.0 Introduction

1.1 This report has been prepared by Sharps Acoustics LLP (SAL) on behalf of .Big Yellow Self Storage Company Limited to provide an assessment of potential noise impacts from the use of the site at Staples Corner, Brent Cross, London, NW2 1LY.

1.2 This report provides details of relevant policy, guidance and baseline survey work carried out and the assessment conducted and conclusions.

Site Description

1.3 The site is located on Edgware Road (A5) in London and currently comprises a Renault and Dacia dealer.

1.4 The site is roughly quadrant in shape, with the river Brent immediately to the north-west, with Travelodge London Brent Cross on the opposite side. Immediately to the north-east is the Midland Main Line railway, which runs elevated to the site, with commercial premises located in the railway arches below, and the M1 beyond. Immediately to the south is the Staples Corner West roundabout, with the North Circular (A406), and Edgware Road (A5) running perpendicular in an elevated position above the roundabout. Beyond road network are further commercial premises.

1.5 The site, surrounding area and closest noise-sensitive receptor are shown in Figure A1 in Appendix A.

Proposed Development

1.6 The proposal is for the demolition of the existing buildings and the construction of a self-storage facility with external units (Use Class B8) and flexible office units (Use Class E(g)(i)), together with a service yard, car parking area and landscaping.

1.7 The proposed ground floor site layout is shown in Figure A2 in Appendix A.

2.0 Assessment Methodology and Criteria

National Planning Policy Framework (NPPF) (2021)

2.1 Government planning policy in relation to noise is contained in the National Planning Policy Framework (NPPF). The relevant paragraph from this (paragraph 185) states:

> *"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 …"*

2.2 The requirement to avoid significant impacts and to mitigate and reduce to a minimum other adverse effects was originally recommended in the Noise Policy Statement for England (NPSE).

Noise Policy Statement for England (NPSE)

2.3 The 2010 DEFRA publication *'Noise Policy Statement for England'* (NPSE) sets out policy advice applicable to the assessment and management of noise, including environmental noise. The NPSE states three policy aims, which are:

- *"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."*

2.4 All three of these aims are to be considered in the context of Government policy on sustainable development.

2.5 The first two aims require that no significant adverse impact should occur and, where noise falls between the lowest observable adverse effect level (LOAEL) and the significant observed adverse effect level (SOAEL), then according to the NPSE:

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

2.6 The NPSE notes that, *"It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times".*

2.7 The NPSE describes the Government's "guiding principles of sustainable development", listing the following as underpinning their sustainable development strategy:

- ensuring a strong, healthy and just society;
- using sound science responsibly;
- living within environmental limits;
- achieving a sustainable economy; and
- promoting good governance.

2.8 Thus, noise should not be considered in isolation; the economic and social benefit of a proposed development should be considered alongside the potential adverse effects from noise.

Planning Practice Guidance on Noise (PPG: Noise)

2.9 The Government first published their Planning Practice Guidance on noise (PPG) in March 2014, with the most recent version issued in July 2021. The PPG provides guidance on the interpretation and implementation of planning policy, as contained in the NPPF and the NPSE.

2.10 The use of the lowest observed adverse effect level (LOAEL) and significant observed adverse effect level (SOAEL) for the assessment of noise impacts is reinforced in the PPG, which seeks to define human perception at these effect levels.

2.11 The PPG describes the LOAEL as the level at which *"noise can be heard and causes small changes in behaviour, attitude or other physiological response"* and it is *"present and intrusive"*. Below this level, the PPG describes the NOAEL, or No Observed Adverse Effect Level, which it notes *"can be heard but does not cause any change in behaviour, attitude or other physiological response"* as the noise is *"present but not intrusive"*. The NOAEL is not included in the NPSE and is introduced in the PPG. Below the NOAEL, the PPG describes the NOEL, or No Observed Effect Level, where noise is *"not present"* and has *"no effect"*.

2.12 The PPG describes the LOAEL as the:

> *"… boundary above which the noise starts to cause small changes in behaviour and attitude, for example, having to turn up the volume on the television or needing to speak more loudly to be heard. The noise therefore starts to have an adverse effect and consideration needs to be given to mitigating and minimising those effects (taking account of the economic and social benefits being derived from the activity causing the noise)."*

2.13 Significant observable adverse effects, i.e. those occurring at or above the SOAEL, are described as *"present and disruptive"* and the PPG states that above the SOAEL:

> *"… the noise causes a material change in behaviour such as keeping windows closed for most of the time or avoiding certain activities during periods when the noise is present. If the exposure is predicted to be above this level the planning process should be used to avoid this effect occurring, for example through the choice of sites at the plan-making stage, or by use of appropriate mitigation such as by altering the design and layout. While such decisions must be made taking account of the economic and social benefit of the activity causing or affected by the noise, it is undesirable for such exposure to be caused."*

Barnet's Local Plan (Core Strategy) Development Plan Document (September 2012)

2.14 The Barnet Local Plan provides advice for developers submitting planning applications in the area.

2.15 The plan states that noise impact assessments are required for developments likely to generate or be exposed to significant noise. Policy CS13 Ensuring the efficient use of natural resources references Supplementary Planning Document (SPD) Sustainable Design and Construction.

2.16 In addition Policy DM04 states that proposals to locate development that is likely to generate unacceptable noise levels close to noise sensitive uses will not normally be permitted.

2.17 Furthermore with regard to noise, the Plan references and the Mayor's Ambient Noise Strategy for understanding noise and identify best practice.

SPD Sustainable Design and Construction (October 2016)

2.18 The Sustainable Design and Construction SPD sets out the technical aspects of the design standards in the Borough.

2.19 Table 2.14.3 Noise Quality Requirements states that for all noise sensitive and noise creating developments the council will refer to the standards set out for internal and external noise levels in BS8233:2014 and to the approach of BS4142:2014.

2.20 The Table also states that…

> *"Any proposed plant and machinery shall be operated so as to ensure that any noise generated is at least 5dB(A) below the background level, as measured from any point 1 m outside the window of any room of a neighbouring residential property. Plant should also be installed to ensure that no perceptible noise or vibration is transmitted through the structure to adjoining premises."*

The Mayor's Ambient Noise Strategy

2.21 The main aim of the Mayor's Ambient Noise Strategy is:

"…to minimise the adverse impacts of noise on people living and working in, and visiting London using the best available practices and technology within a sustainable development framework"

2.22 The objectives of the strategy include:

- To minimise the adverse impacts of industrial noise, recognising the use of best practicable means/best available techniques, and the need to retain a diverse and sustainable economy
- To improve noise environments in London's neighbourhoods, especially for housing, schools, hospitals and other noise sensitive uses
- To protect and enhance the tranquillity and soundscape quality of London's open spaces, green networks and public realm

The London Plan 2021

2.23 The London Plan 2021 is a development strategy for greater London. Policy D14 refers to noise and states that to reduce, manage and mitigate noise to improve health and quality of life, residential and non-aviation development proposals should manage noise by a number of methods, including but not limited to:

- Avoiding significant adverse noise impacts on health and quality of life

- Mitigating and minimising the existing and potential adverse impacts of noise on, from, within, as a result of, or in the vicinity of new development without placing unreasonable restriction on existing noise-generating uses.

- Improving and enhancing the acoustic environment and promoting appropriate soundscapes (including Quiet Areas and spaces of relative tranquility)

Derivation of suitable assessment methodology and criteria

2.24 It is possible to apply objective standards to the assessment of noise and the effect produced by the introduction of a certain noise source may be determined by several methods, as follows:

- The effect may be determined by reference to guideline noise values. British Standard (BS) 8233:2014 and a number of published documents from the World Health Organisation (WHO) (such as "*Guidelines for Community Noise"*) contain such guidelines.

- Alternatively, the impact may be determined by considering the change in noise level that would result from the proposal, in an appropriate noise index for the characteristic of the noise in question. There are various criteria linking change in noise level to effect. This is the method that is suited to, for example, the assessment of noise from road traffic because it is capable of displaying impact to all properties adjacent to a road link irrespective of their distance from the road.

- Another method is described within BS 4142, the current version of which is BS 4142:2014+A1:2019, 'Methods for rating and assessing industrial and commercial sound', to determine the significance of sound impact from sources of industrial and/or commercial nature. The sources that the standard is intended to assess are sounds from industrial and manufacturing processes, sound from fixed plant installations, sound from loading and unloading of goods at industrial and/or commercial premises and the sound from mobile plant and vehicles, such as forklift, train or ship movements.

2.25 In order to assess noise from the proposed redevelopment of the site for the intended use, the approach set out in BS4142 is most appropriate, as the noise sources present would be similar to those listed within the scope of that standard. Paragraphs 2.21 to 2.27 below explain the key features of this standard in more detail.

British Standard BS 4142: 2014 + A1:2019

2.26 British Standard (BS) 4142: 2014+A1: 2019 *'Methods for rating and assessing industrial and commercial sound'* (BS4142) describes a method for rating and assessing sound of an industrial or commercial nature, which includes, in Section 1.1 of the standard:

"sound from industrial and manufacturing processes;

sound from fixed installations which comprise mechanical and electrical plant and equipment;

sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and

sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site."

2.27 The industrial or commercial sound is assessed outside an existing or proposed dwelling or premises used for residential purposes. BS4142 does not consider internal spaces in terms of its numerical assessment.

2.28 The procedure contained in BS4142 begins by quantifying the "specific sound level", which is the measured or predicted level of sound from the source in question over a one-hour period for the daytime or a 15-minute period for the night-time. Daytime and night-time are not defined in BS4142, but the standard notes that they are typically taken to be 0700 to 2300 hours for daytime, and 2300 to 0700 hours for night-time.

2.29 BS4142 sets out a number of methods of determining the specific sound level including, for situations where the specific sound source does not yet exist, the ability to estimate it, stating, at Section 7.3.6:

"Determine the specific sound level by calculation alone if measurement is not practicable, for example if the source is not yet in operation. In such cases, report the method of calculation in detail and give the reason for using it."

2.30 The specific sound level is converted to a rating level by adding penalties on a sliding scale to account for potentially tonal, impulsive or intermittent elements. The standard sets out subjective and objective methods for determining the presence of tones or impulsive elements but notes that the objective methods should be used where the subjective method is not sufficient. For situations where the specific sound source does not yet exist, the objective methods cannot be used.

2.31 The assessment outcome results from a comparison of the rating level with the background sound level (which is determined by the assessment of typical background noise levels by survey). The standard states, in Section 11:

"a) Typically, the greater this difference, the greater the magnitude of the impact.

b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.

c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.

d) 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.

NOTE 2 Adverse impacts include, but are not limited to, annoyance and sleep disturbance. Not all adverse impacts will lead to complaints and not every complaint is proof of an adverse impact."

2.32 Finally, BS4142 requires that the level difference is considered in the context in which it is found. Contextual considerations include:

- Absolute level of sound. If the existing level is particularly high or low, then this can affect the significance of a particular difference (assessed as described in 2.21 above).
- The character and level of the residual sound compared to the character and level of the specific sound.
- Sensitivity of receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions such as facade insulation treatment; ventilation and/or cooling that will reduce the need to have windows open to provide rapid or purge ventilation; and acoustic screening.

3.0 Noise Survey

3.1 An unattended environmental noise survey was carried out between approximately 11:15 hours on Friday 29th September and 11:30 hours on Tuesday 3rd October 2023. Meteorological conditions were generally suitable for the measurement of environmental noise.

3.2 The recording equipment was a Norsonic 140 Sound Analyser. The equipment was calibrated before and after the survey with no significant drift.

3.3 Measurements were conducted at a single location along the north-west boundary of the site, as shown in Figure A1 in Appendix A.

3.4 The measurements were conducted in consecutive 15-minute periods in free field conditions with the microphone at a height of approximately 3m.

3.5 The daytime and night-time summary of survey results are presented in Table 3.1 below and shown in full in Figure B1 in Appendix B.

Table 3.1: Summary of noise survey results

Location	Period	Hours	Sound Pressure Levels dB		
			$L_{Aeq,T}$	L_{AFmax}	Typical $L_{A90,T}$
MP1	Day	07:00 - 23:00 hours	61	88	58
	Night	23:00 - 07:00 hours	58	86	55

3.6 For information purposes it can be noted:

- Measurements of sound level were all made with the A-weighting, which is a filter applied to the sound level meter to simulate the frequency response of the human ear, which is more sensitive to high frequency sound than low.

- L_{Aeq} is the equivalent continuous noise level which is a method of averaging the varying noise level over the time period into a single figure value. The L_{Aeq} has the same sound energy as the fluctuating level over that period. The L_{Aeq} is also known as the "ambient level" and in BS4142 the L_{Aeq} in the absence of the proposed development sound is known as the "residual level".

- L_{Amax} is the highest level within the measurement period.

- L_{A90} is the noise level exceeded for 90% of the time and is referred to as the background noise level.

3.7 As the survey was predominantly unattended it is not possible to comment on the noise levels throughout the survey. However, during the set up and collection of the equipment, the noise levels were predominantly controlled by traffic noise on the surrounding road network, with occasional trains also affecting the measured levels. During observations it was noted that the existing noise climate comprised frequent tonal horns, intermitted train pass-bys and impulsive characteristics associated with trains passing over railway points.

3.8 Reference to Figure B1 in Appendix B shows that during the unattended aspects of the survey the noise levels follow a typical traffic-controlled environment with the loudest noise levels measured during the day, with a reduction in the evening and the lowest levels measured at night.

4.0 Assessment

Predicted Specific Levels from Site Operations

4.1 Noise sources to be considered from site activities are vehicle movements, movement of goods, doors, voices and any other noise sources resulting from the use, including servicing of both the Big Yellow store and the retail development. Figure A2 in Appendix A shows the proposed ground floor layout.

4.2 Noise will occur from customers using the Big Yellow forecourt. In 2007, surveys of noise levels and activities at eight Big Yellow stores was undertaken to establish the frequency of occurrence of different activities and their noise levels at a reference distance. In March 2022, a further, comprehensive two week long study was undertaken at the Big Yellow site in Fulham to update this data in the light of shifting patterns of use over the previous 14 years. The results of this survey work have been reported in a stand alone report, the body of which is attached as Appendix C. (Note: two of the appendices of the forecourt noise study report (Appendices B and C) are very long (86 pages containing tables of raw data) and have therefore been omitted from Appendix C of this report. This additional data can be made available on request. The findings of the Fulham forecourt noise study are summarised below.

4.3 Noise from the Big Yellow forecourt will be generated from two main sources:

- Vehicles arriving and leaving site, manoeuvring and parking; and
- Loading and unloading activities.

4.4 The Big Yellow self-storage facility will be staffed continuously between 08:30 and 17:30 hours Monday to Friday, 09:00 and 17:30 hours Saturday and 10:00 to 16:00 hours Sunday, and the majority of custom occurs during that period. However, some customers may wish to access the site outside of these hours, and this would be permitted between 05:00 and 23:00 hours. A small percentage of customers currently make use of these extended hours.

4.5 Activities associated with a self-storage site such as this can be grouped into four categories for the purposes of a noise assessment:

- Cars /motorbikes / small vans: enquiries (no goods) or light loads only (carried by hand)
- Cars /motorbikes / small vans: with heavier loads using trolley
- Larger vehicles with no goods or light loads only (carried by hand)
- Larger vehicles with heavier / more bulky loads

4.6 The proportion of the total number of each of these activities at a store each day and the single event levels from each activity at reference distance 10m has been found (from the 2022 Fulham survey) to be as shown in Table 4.1 below.

Table 4.1: Sound source data for Big Yellow forecourt areas

Event category	Percentage of total	L_{AE}, dB
Cars /motorbikes / small vans: enquiries (no goods) or light loads only	43%	71
Cars /motorbikes / small vans: with heavier loads using trolley	22%	80
Larger vehicles with no goods or light loads only	16%	73
Larger vehicles with heavier / more bulky loads	19%	83

4.7 The highest L_{Amax} level which occurs from any activity at a reference distance of 10m was found to be 85dB, L_{Amax}. The highest level which occurs from smaller vehicles with no goods or light loads only at a reference distance of 10m was found to be 70dB, L_{Amax}.

4.8 Transport consultants, Rappor, have estimated that the total numbers of vehicles likely to use the Staples Corner site would be 178 vehicles per day, that being 169 vehicles during the daytime period (07:00 to 23:00 hours and 9 vehicles during the night-time period (05:00 to 07:00 hours). If it is assumed that all of the noise from these vehicle movements and loading / unloading were to take place only in the busy 10 hour period between 0800 and 1800 hours (which would be similar to the hourly level, as some

of the activity would actually take place outside of this period), the 10-hourly noise from this site at a distance of 10 metres from the sources can be predicted using the relationship:

$L_{Aeq,\,T} = L_{AE} + 10 \log N - 10 \log t$

Where:

'T' is the time period of interest, in this case the busiest 10 hours of the day;

't' is the number of seconds in time T:

in 15-minutes this would be 900s, in 10-hour this would be 36000s;

'N' is the number of events to occur in time T, and

'L_{AE}' is the single event level (at 10 metres): the amount of noise caused by an event, compressed into one second.

4.9 The resultant daytime ambient noise levels, $L_{Aeq,10hour}$ from each activity type during the busiest period of the day at 10 metres are shown in Table 4.2 below.

Table 4.2 Predicted noise levels from different activities on site at 10m

Vehicle Type	Noise level at 10 metres from the source, dB		
	L_{AE}	**N**	**$L_{Aeq,\,10hour}$**
Cars /motorbikes / small vans: enquiries (no goods) or light loads only	71	51	44
Cars /motorbikes / small vans: with heavier loads using trolley	80	26	50
Larger vehicles with no goods or light loads only	73	19	42
Larger vehicles with heavier / more bulky loads	83	22	53

4.10 Using the data described in Table 4.2 above, adding this together and correcting for distance, noise levels at the nearest noise sensitive premises which are approximately 39m from the closest loading bays of the external storage units would be $L_{Aeq,10h}$ 43dB. It should be borne in mind that when considering the worst-case hour between 10:00 hours and 11:00 hours, Rappor have estimated 21no. vehicle movements/ unloading activities, which would result in an $L_{Aeq,1h}$ of 44dB at the closest noise-sensitive premises. These levels are assuming no reduction in level between source and receptor due to screening. This is the specific level, according to BS4142 terminology.

4.11 At night, the busiest 15 minutes should be considered, according to BS4142. Traffic consultant Rappor have estimated 4no. vehicles during the busiest hour of the night-time period. It is assumed, for the purposes of a robust assessment, that in the busiest 15 minutes at night (between 05:00 and 07:00 hours) all 4 vehicles could arrive, which is unlikely. This would result in an overall noise level in the absence of any screening of $L_{Aeq,15min}$ 43dB at the closest noise-sensitive receptor.

Rating Level

4.12 To convert these specific levels to rating levels, a character penalty may be added, where applicable. Character corrections (also known as penalties) may be added if the specific sound has distinctive characteristics which might increase the significance of impact over that expected from a sound with the same level but an anonymous character or which is masked by the residual sounds present.

4.13 To do this, the assessor must consider subjective prominence of the character of the specific sound at the noise-sensitive locations and the extent to which any acoustically distinguishing characteristics might attract attention. Corrections can be added where there is tonality, impulsivity or intermittency present or, if none of these occur but the sound contains some other characteristic which is distinctive against the residual acoustic environment.

4.14 In this case, the existing noise climate was predominantly controlled by traffic noise and occasional train pass-bys. On this basis, noise emanating from vehicles moving around the Big Yellow site would be indistinguishable against the existing noise climate.

4.15 In addition, observations during the noise survey indicated that the existing noise climate contained tonal, impulsive and intermittent sound characteristics. On this basis, any tonal, impulsive and intermittent sound characteristics associated with the loading or unloading of goods would be similar in character to the existing noise climate.

4.16 On the basis of the above, in this instance, it would not be appropriate to add a character correction to the specific level to arrive a rating level; the rating level would therefore be the same as the specific level.

Differences Between Rating and Background Levels

4.17 The predicted differences between rating and background levels for those receptors adjacent to the site which are predicted to experience the highest levels of specific sounds would therefore be as shown in Table 4.3 below.

Table 4.3: Predicted rating levels, background levels and level differences

Location	Period	Rating level $L_{Ar,T}$ dB	Typical Background level $L_{A90,T}$ dB	Difference between rating and background level dB
NSR1 – Travelodge London Brent Cross	Daytime	43	58	-15
	05:00 to 07:00 hours	43	55	-12

4.18 It should be borne in mind that the Standard states:

> *"a) Typically, the greater this difference, the greater the magnitude of the impact.*
>
> *b) A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context.*
>
> *c) A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context.*
>
> *d) 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.*

4.19 On the basis of the above, Table 4.3 shows that during the daytime and night-time period the calculated sound rating level of sound emanating from the Big Yellow store would be well below the BS4142 background sound levels at the closest noise-sensitive receptor. On this basis, the initial assessment suggests that noise emanating from the Big Yellow store would have a low impact during the daytime and night-time, dependant on context.

Context

4.20 In general, 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); a difference of around +5dB is likely to be an indication of an adverse impact and a level difference of +10dB indicates a significant adverse impact. However, these values depend on the context in which they occur. Context must be considered, as set out in guidance in Clause 11 of BS4142.

4.21 The specific sound levels of the servicing activities are predicted to be well below the existing average ambient noise levels over the proposed servicing periods.

4.22 In addition, as stated above, the existing noise climate is affected by traffic noise and contains tonal, impulsive and intermittent sounds. On this basis the character of sound emanating from the Big Yellow store would be similar to the character of the existing noise climate.

4.23 In addition, it is understood that the closest noise-sensitive-receptor (Travelodge London Brent Cross) benefits from a mechanical ventilation solution, and therefore, residents would not need to rely on openable windows to ventilate their hotel rooms. On this basis, noise levels emanating from the Big Yellow store would be reduced even further.

4.24 In addition, the specific sound levels of the servicing activities are predicted to be more than 10dB below the existing average ambient noise levels over the proposed servicing periods. It should be borne in mind that it is widely accepted that two noise levels which are at least 10dB apart will have no effect on each other. Considering this, the average noise levels emanating from the Big Yellow store would not

affect the overall external average daytime or night-time noise levels at the closest noise-sensitive receptor.

4.25 On this basis, considering the context, noise from servicing activities associated with the Big Yellow store should have a low impact at the closest noise-sensitive receptor during both the daytime and night-time periods when assessed in accordance with BS4142:2014.

Noise from mechanical services / plant noise

4.26 The exact nature and location of any plant, and its associated noise characteristics are yet to be determined, so it would be appropriate to impose a planning condition to control noise output from the plant.

4.27 It should be borne in mind that, as stated in Section 2.19, the Supplementary Planning Document Sustainable Design and Construction (October 2016) requires mechanical plant to be controlled at least 5dB below the existing background level.

4.28 Accordingly, the following condition is recommended:

> *"The cumulative rating level of noise emitted by all fixed plant on the site shall not exceed 53dB at any noise sensitive premises between 07:00 and 23:00 and 50dB between 23:00 and 07:00 hours. The measurement and assessment shall be made according to BS 4142:2014+A1:2019."*

4.29 It should be borne in mind that, if the BREEAM credit is sought for Pol05, the target levels would be the same as those prescribed in 4.28 above.

Conclusions

4.30 This report has been prepared by Sharps Acoustics LLP (SAL) on behalf of .Big Yellow Self Storage Company Limited to provide an assessment of potential noise impacts from the use of the site at Staples Corner, Brent Cross, London, NW2 1LY.

4.31 The assessment has shown that considering the context, noise from servicing activities associated with the Big Yellow store should have a low impact at the closest noise-sensitive receptor during both the daytime and night-time periods when assessed in accordance with BS4142:2014.

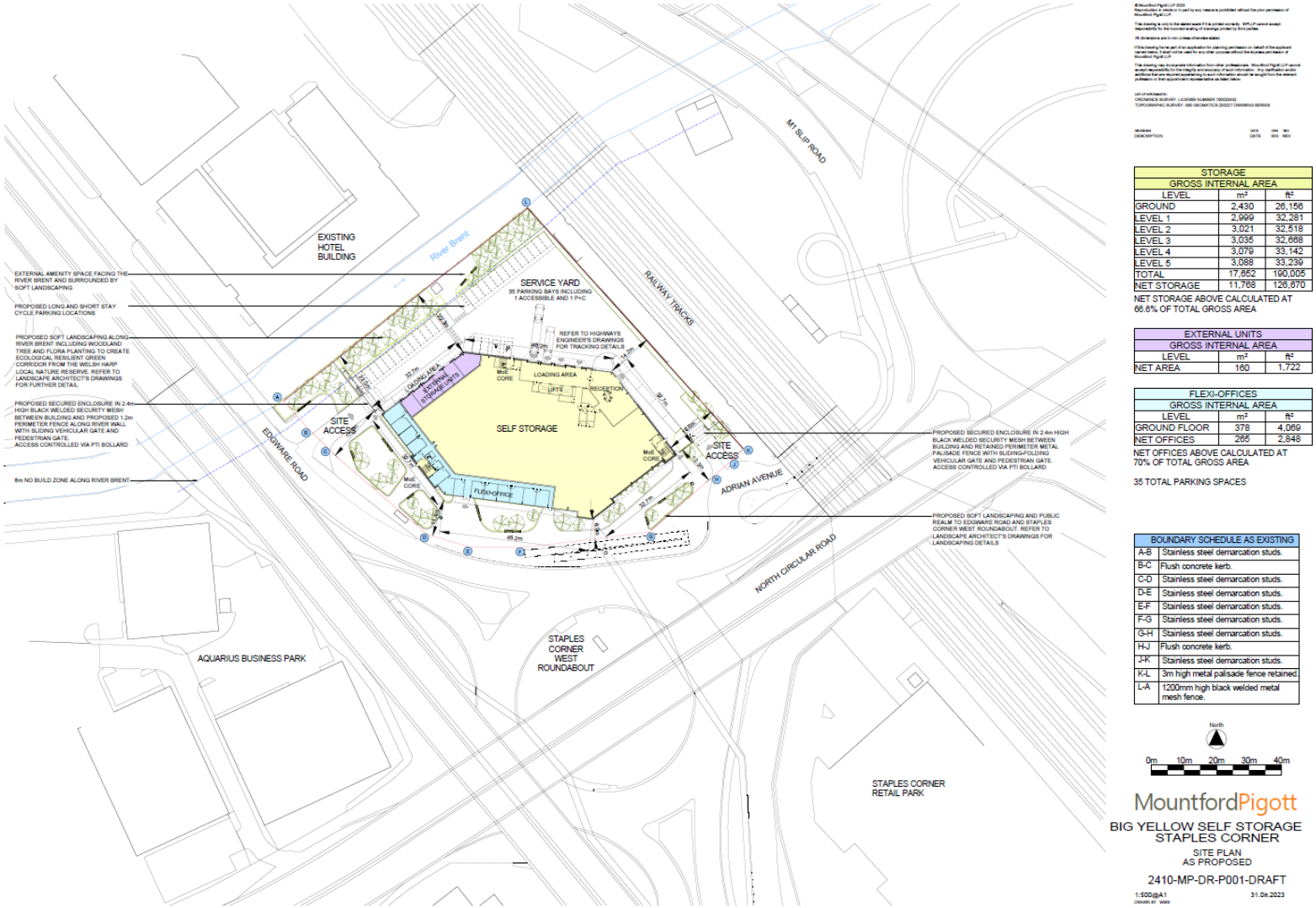
4.32 Mechanical services and any other external plant can be controlled by condition to ensure that there are no adverse noise effects from its operation.

4.33 On the basis of the above, the development would meet the requirements of The Barnet Local Plan, the Barnet Sustainable Design and Construction SPD, The Mayor's Ambient Noise Strategy and The London Plan 2021.

Appendix A: Plans

Figure A1: Aerial view showing site, surrounding area and measurement position

Figure A2: Proposed site layout at ground floor



STORAGE GROSS INTERNAL AREA		
LEVEL	m²	ft²
GROUND	2,430	26,156
LEVEL 1	2,999	32,281
LEVEL 2	3,021	32,518
LEVEL 3	3,035	32,668
LEVEL 4	3,079	33,142
LEVEL 5	3,088	33,239
TOTAL	17,652	190,005
NET STORAGE	11,768	126,670

NET STORAGE ABOVE CALCULATED AT 66.6% OF TOTAL GROSS AREA

EXTERNAL UNITS GROSS INTERNAL AREA		
LEVEL	m²	ft²
NET AREA	160	1,722

FLEXI-OFFICES GROSS INTERNAL AREA		
LEVEL	m²	ft²
GROUND FLOOR	378	4,069
NET OFFICES	265	2,848

NET OFFICES ABOVE CALCULATED AT 70% OF TOTAL GROSS AREA

35 TOTAL PARKING SPACES

BOUNDARY SCHEDULE AS EXISTING	
A-B	Stainless steel demarcation studs.
B-C	Flush concrete kerb.
C-D	Stainless steel demarcation studs.
D-E	Stainless steel demarcation studs.
E-F	Stainless steel demarcation studs.
F-G	Stainless steel demarcation studs.
G-H	Stainless steel demarcation studs.
H-J	Flush concrete kerb.
J-K	Stainless steel demarcation studs.
K-L	3m high metal palisade fence retained.
L-A	1200mm high black welded metal mesh fence.

North

0m 10m 20m 30m 40m

MountfordPigott

BIG YELLOW SELF STORAGE
STAPLES CORNER

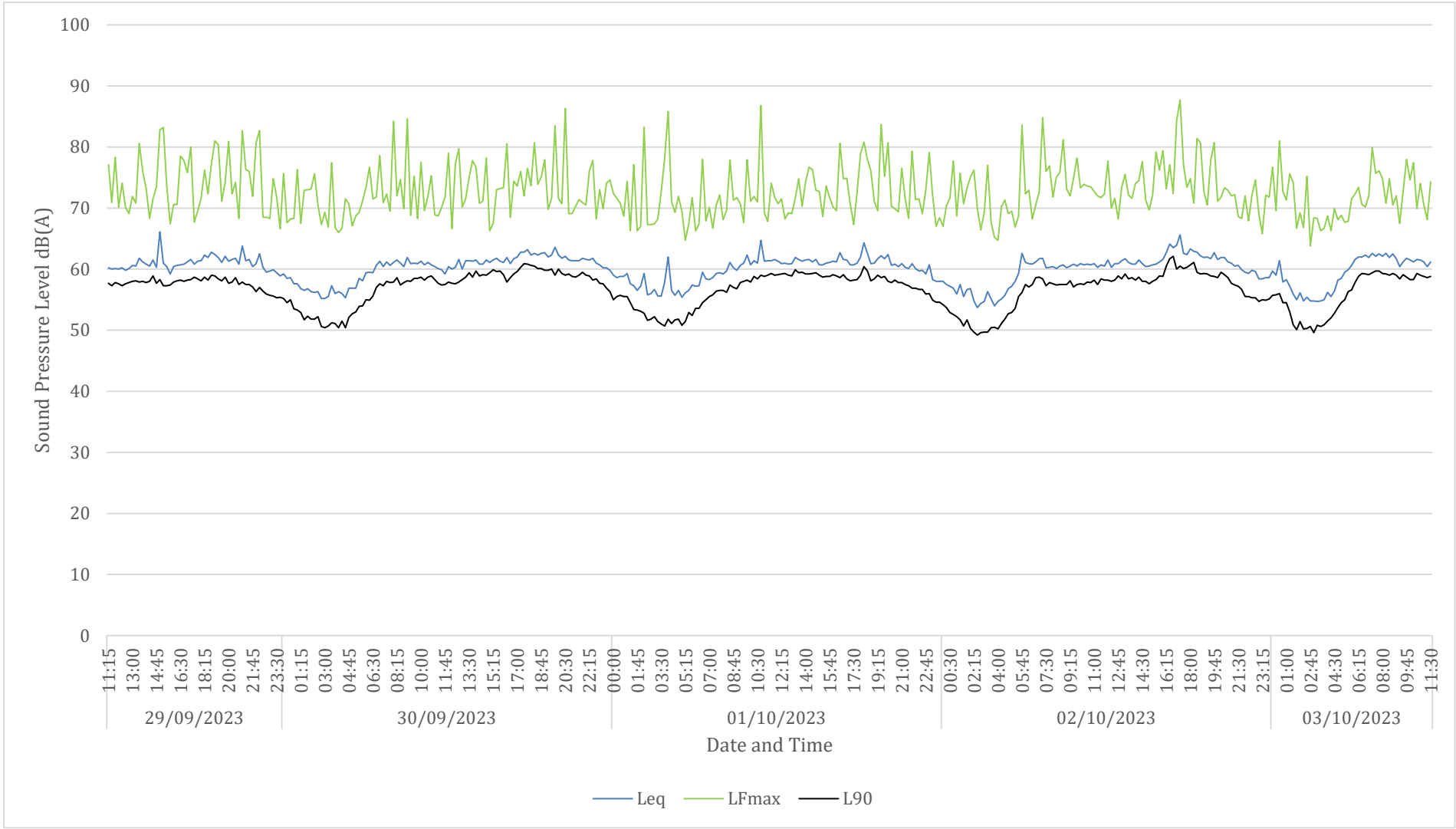
SITE PLAN
AS PROPOSED

2410-MP-DR-P001-DRAFT

1:500@A1 31.08.2023

Appendix B: Noise Survey Results

Figure B1: MP1 Measured Levels



Appendix C: Big Yellow forecourt noise study

sharps acoustics

Big Yellow, Fulham

Assessment of forecourt noise

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13th May 2022

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Appendices

1.0 Introduction

1.1 Sharps Acoustics LLP (SAL) has been commissioned by .Big Yellow Self Storage Company Limited to provide a detailed assessment of forecourt noise at the Big Yellow store at 71 Townmead Rd, London SW6 2ST (Fulham) to establish an up to date source of data for future noise assessments.

1.2 A similar survey was carried out previously in 2006 to determine the different types of activities present on the forecourt and the noise levels produced by each. However, since the patterns of use of Big Yellow's stores has changed to a degree due to the different way that businesses operate in 2022, where more goods are bought now online and there is a greater demand for commercial storage than there was in 2006, it was considered prudent to update the data. The Fulham store was chosen as it is the largest in the UK and therefore provides the largest data set when surveyed over a particular period. Operations at Fulham are also understood to be representative of the patterns of use at other, smaller stores. The results can therefore be scaled for other stores, based on their relative floor areas, compared with the Fulham store.

1.3 For a two week period in March 2022, both noise levels and activities were recorded (using two noise meters and two cameras). The two sets of data were then analysed and combined to provide an overview of noise levels from different activities, with other, offsite sound sources excluded from measurements.

1.4 This report provides details of the survey carried out, an analysis of the results and a summary of the noise levels by different types of noise event. It is intended that the findings from this study be used for future noise assessment reports at other stores, to explain how noise source assumptions and levels have been derived.

1.5 Section 2.0 provides details of the survey methodology. Section 3.0 presents survey results. Section 4.0 provides a summary of findings.

2.0 Survey Details

2.1 The noise and camera survey was carried out between 14th and 28th March 2022. Measurements and recordings were taken continuously over day and night periods. Microphones were fitted with integrated wet weather kits and wind-shields. Camera and noise measurement locations, were as shown in Figure A1 in Appendix A. The microphone at location 1 was at a height of approximately 1.5 metres above ground level, free field; the microphone at location 2 was at a height of approximately 2.1m above ground level at one metre from a facade.

2.2 All measurements were made continuously at 0.1 second resolution using 01dB Fusion sound level meters. These are Type 1 sound level meters and they were field checked for calibration before and after the measurements. No significant drift was noted. Audio recordings were made throughout.

2.3 Weather was generally good for measurements of environmental noise during the majority of the survey. However, there were some periods when heavy rain affected measured levels and these periods were excluded from subsequent analysis. This was particularly so at location 2, where, due to the close proximity of a drain pipe to the microphone, rain noise dominated at times.

2.4 For information purposes it can be noted:

- Measurements of sound level were all made with the A-weighting, which is a filter applied to the sound level meter to simulate the frequency response of the human ear, which is more sensitive to high frequency sound than low.

- L_{Aeq} is the equivalent continuous noise level which is a method of averaging the varying noise level over the time period into a single figure value. The L_{Aeq} has the same sound energy as the fluctuating level over that period.

- The L_{AE} is the single event level which is the total sound energy over the duration of an event, compressed into a one second period. Hence, if the measured level of a particular event was 60dB, L_{Aeq} and the event lasted 60 seconds, this would result in a L_{AE} of 60 + 10 x log(60) = 68dB.

- L_{Amax} is the highest level within the measurement period.

2.5 Cameras recorded activities continuously over the same period and so it was possible to analyse camera footage and noise level measurements together to determine levels for each activity. Audio recordings were also made throughout to enable noises from sources other than the Big Yellow forecourt (such as aircraft, noisy motorbikes passing the site, rain and activities on adjacent sites) to be excluded from results.

3.0 Survey Results

3.1 Noise survey results are shown graphically in Appendix B. Levels at each survey location were dependant on both forecourt activities and on other sources. In general, the noise level attributable to activities on the forecourt during the busier hours of the day were generally between 51 and 53dB, $L_{Aeq,1h}$ at both locations and the level from other sources during the same period was 55 to 58dB, $L_{Aeq,1h}$. The overall measured level each day was greatly influenced by the presence (or otherwise) of aircraft and, in particular, helicopters.

3.2 Events were divided up by vehicle type and activity type using the following categories:

1. Type of vehicle:
    a. Motorcycle
    b. Car or light van
    c. Large van (eg. Transit)
    d. Small lorry (eg. Luton)
    e. OGV
    f. Other (specify)

2. Type of activity of vehicle occupant(s)
    a. None – remains in vehicle or visits the store without any apparent goods
    b. Walk to store and back out, carrying a light goods / envelope, small boxes etc

c. Use trolley to take goods to or from store
d. Use forklift to take goods to or from store
e. Other – as specified.

3.3 The camera recordings were initially analysed by a third party, who produced a summary of each loading / unloading event on each day. This summary is presented in Appendix C.

3.4 Camera recordings and measured levels were analysed jointly to provide an estimate of noise levels from different vehicles and different types of events with ambient sounds from other sources excluded. Typical ranges of noise levels for each event type were as shown in Table 3.1 below.

Table 3.1: Measured event level ranges, normalised to 10m (free field)

Event	Event level, L_{AE}, dB			
	None	Light goods only	Use trolley / forklift	Other
Motorcycle	70	72	-	-
Car or light van	68-70	67-71	77-80	-
Large van (eg. Transit)	67-71	68-72	80-84	-
Small lorry (eg. Luton)	70-73	66-74	79-83	-
OGV	69-72	70-73	80-83	-
Misc (highest)	-	-	-	85
E-scooter / cycle	0	0	-	-

3.5 The highest L_{Amax} values at 10m were between 80 and 85dB (free field); these occurred during unloading of larger vehicles with heavier goods. The highest L_{Amax} values which occurred (at reference distance 10m) other than during loading or unloading of larger vehicles / heavier goods were generally between 74-79dB (free field).

3.6 Wherever possible, event types were combined to simplify the analysis process. For example, a small lorry and a large van with light goods produced very similar overall noise level and so were grouped together. It was found that, in noise terms, the following activities had noise levels which were sufficiently similar that they could be grouped together:

- Cars /motorbikes / small vans: enquiries (no goods) or light loads only
- Cars /motorbikes / small vans: with heavier loads using trolley
- Larger vehicles with no goods or light loads only
- Larger vehicles with heavier / more bulky loads
- Misc (a small handful of vehicles, such as a refuse truck)

- E-scooters / cycles.

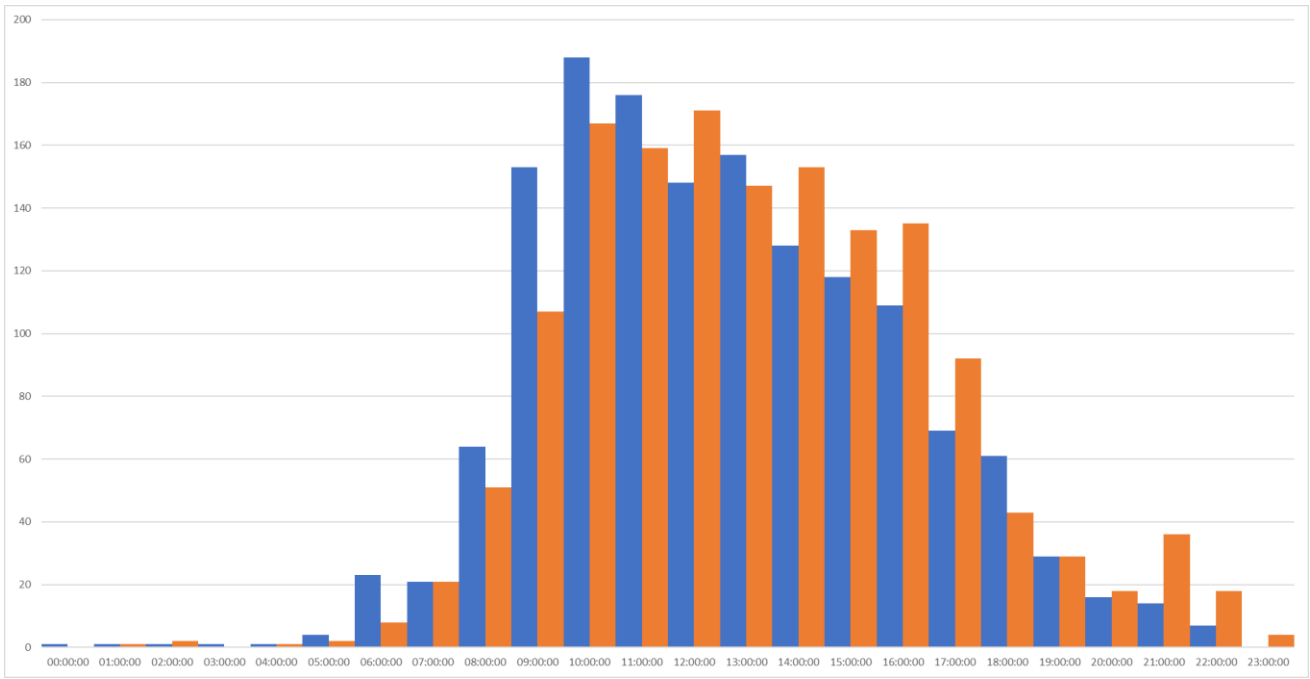
3.7 The total numbers of events in the two week period were as shown in Table 3.2 below.

Table 3.2: Total numbers of events in each category

Event category	Number of each	Percentage of total
Cars /motorbikes / small vans: enquiries (no goods) or light loads only	604	41.5%
Cars /motorbikes / small vans: with heavier loads using trolley	313	21.5%
Larger vehicles with no goods or light loads	219	15.1%
Larger vehicles with heavier / more bulky loads:	272	18.7%
Misc	5	0.3%
E-scooter / cycle	41	2.8%
Total events for two weeks	1454	100%

3.8 In addition to the number of vehicle movements and activities, the data provided information about the pattern of use across the day. The total numbers of vehicles arriving and leaving over a 24 hour period is summarised in Figure 3.1 below.

Figure 3.1: graph showing distribution of arrivals (blue) and departures (orange) over a 24 hour period



3.9 This shows that majority of activity on site took place between 0800 hours and 1800 hours.

4.0 Summary

4.1 The above information can be synthesised into a single table (for this site) which can be scaled (based on the proposed floor area of a new store, compared with the floor area at the Fulham store) to provide predicted free field noise levels from a given forecourt (at a nominal distance of 10m from the loading area).

4.2 Ignoring cycles and e-scooters and "misc" other vehicles, as their numbers are so low, so they have no effect on the predicted level means that there were only 1408 vehicles in the two week period that affected noise levels from the forecourt. Adjusting the percentages from Table 3.2 to take account of the removal of bicycles etc. and rounding the values gives the figures in Table 4.1 below:

Table 4.1: Sound source data for Big Yellow forecourt areas

Event category	Percentage of total	L_{AE}, dB
Cars /motorbikes / small vans: enquiries (no goods) or light loads only	43%	71
Cars /motorbikes / small vans: with heavier loads using trolley	22%	80
Larger vehicles with no goods or light loads only	16%	73
Larger vehicles with heavier / more bulky loads:	19%	83

4.3 Use of the values within this table would provide an estimate of the $L_{Aeq,T}$ at 10m from the loading bays, where time period, T, is a whole working day. Since the majority of activity on site takes place in the 10 hour period between 0800 and 1800 hours, to obtain a prediction of noise levels in one of these hours, one could reasonably compress a "working day" into 10 hours rather than 16 hours. This would result in a slightly higher predicted hourly noise level than would actually occur, but would result in a robust assessment for typical daytime operations.

Appendix A: Survey locations

Figure A1: Survey locations