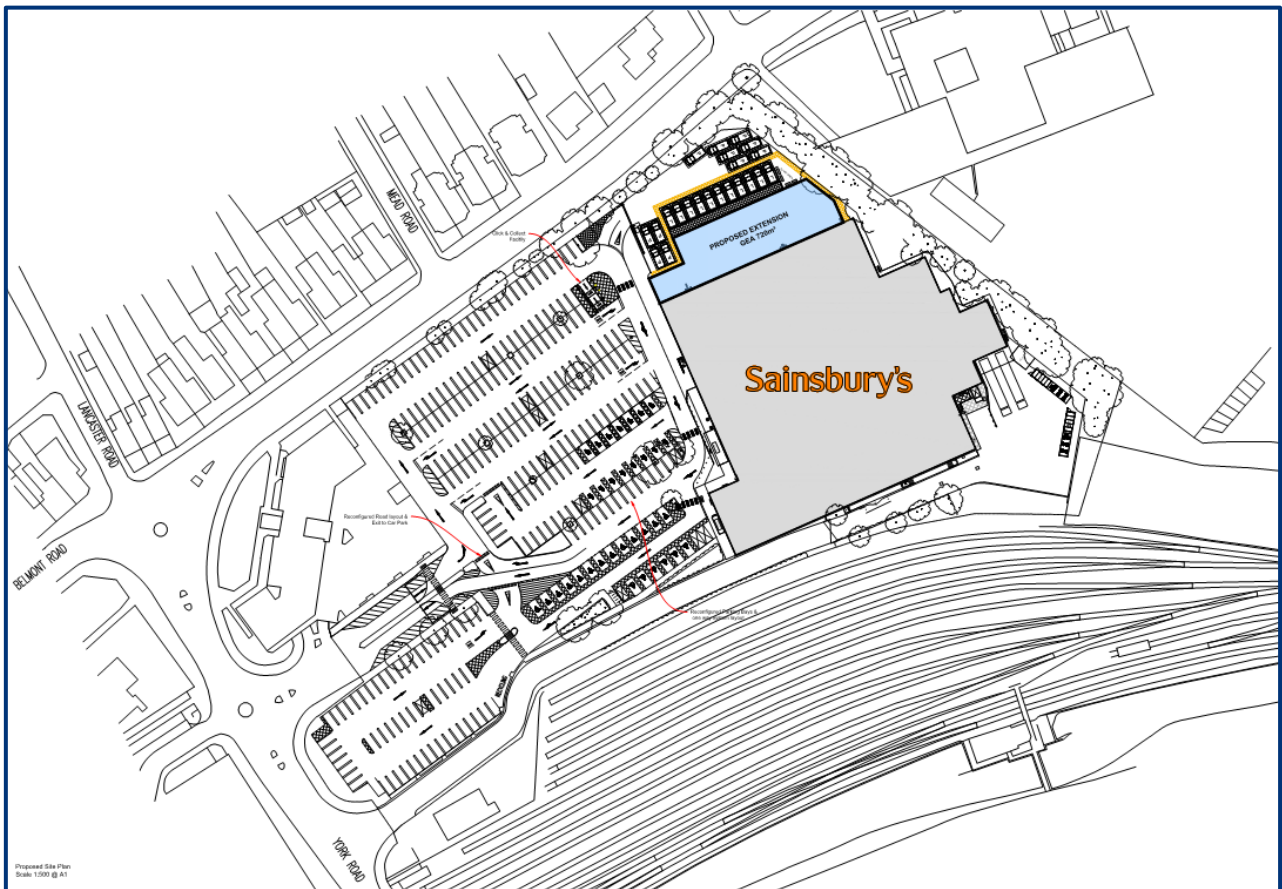


Sainsbury's Supermarkets Limited

Groceries Online (GOL) Facility - Uxbridge



Noise Assessment

May 2021

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3		
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Appendix Contents

Appendix A – Acoustic Terminology and Abbreviations

Appendix B – Report Conditions

1.0 Introduction

1.1 Purpose of this Report

This report presents findings of a noise assessment undertaken to accompany a planning application for a proposed grocery online (GOL) facility located at the existing Sainsbury's store at York Road, Uxbridge. It is understood the operating hours of the GOL facility will be from 06:00 to 23:00. This version of the report includes an updated layout.

A description of the existing noise environment in and around the site is provided. Noise surveys have been undertaken and the results used to verify predictions of the short-term and long-term effects of noise. The noise levels from the proposed development have been predicted at local representative receptors using CADNA noise modelling software which incorporates ISO 9613 methodologies and calculations. A list of acoustic terminology and abbreviations used in this report is provided in Appendix A and a set of location plans and noise contour plots relevant to the assessment are presented in Appendix B.

1.2 Legislative Context (England)

Current Policy guidance with respect to noise is found in the National Planning Policy Framework (NPPF), updated on 19th February 2019. With regard to noise and planning, NPPF contains the following statement at paragraph 170:

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

- e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans*

A further 2 short statements are presented at paragraph 180, which state:

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

- a) "mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life*
- b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

Furthermore, paragraphs 182 and 183 state:

“182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or ‘agent of change’) should be required to provide suitable mitigation before the development has been completed.

183. The focus of planning policies and decisions should be on whether proposed development is an acceptable use of land, rather than the control of processes or emissions (where these are subject to separate pollution control regimes). Planning decisions should assume that these regimes will operate effectively. Equally, where a planning decision has been made on a particular development, the planning issues should not be revisited through the permitting regimes operated by pollution control authorities.”

Planning Practice Guidance (PPG): Noise provides further guidance with regard to the assessment of noise within the context of Planning Policy. The overall aim of this guidance, tying in with the principles of the NPPF and the Explanatory Note of the Noise Policy Statement for England, is to ‘identify whether the overall effect of noise exposure is, or would be, above or below the significant observed adverse effect level and the lowest observed adverse effect level for the given situation.’

A summary of the effects of noise exposure associated with both noise generating developments and noise sensitive developments is presented within the PPG and repeated as follows:

Table 1.1 Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not present	No Effect	No Observed Effect	No Specific Measures Required
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening	Significant Observed Adverse Effect	Avoid

Perception	Examples of Outcomes	Increasing Effect Level	Action
	and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.		
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

2.0 Assessment Methodology

In order to enable the assessment of the proposed GOL hub in terms of LOAEL and SOAEL, Table 2.1 presents equivalent noise levels and associated actions with the target noise level criteria identified. The noise level criteria detailed below have been derived from the following standards and design guidance:

BS 4142:2014+A1:2019 'Methods for rating and assessing industrial and commercial sound'

IEMA Guidelines for Environmental Noise Impact Assessment (Oct 2014)

BS 8233 2014 'Guidance on Sound Insulation and Noise Reduction for Buildings'

Table 2.1 Noise Level Criteria and Actions

Effect Level	Assessment	Noise Level Criteria	Action / Justification
No Observed Effect Level	Background Comparison	BS4142 Score of zero or lower	No Action Required Score of zero or lower is an indication of the sound source having a low impact, depending on context
	Assessment of Overall Change in Noise Levels	Up to 3.0 dB Change or a Reduction in Noise Levels	No Action Required – Change in noise levels unlikely to be perceptible
	Noise Intrusion Assessment	Noise levels are below: <i>Bedrooms: 45 dB L_{Amax}</i>	Action: No Action Required
Lowest Observed Adverse Effect Level (LOAEL)	Background Comparison	BS4142 Score of +5 or lower	No Action Required Difference of +5 dB likely to be an indication of an adverse effect, depending on context BS4142 Score of plus 5 or lower
	Assessment of Overall Change in Noise Levels	Up to 4.9 dB Increase in Noise Levels	No Action Required Slight Impact at Receptor of Some Sensitivity
	Noise Intrusion Assessment	Noise levels are at: <i>Bedrooms: 45 dB L_{Amax}</i>	Action: No Action Required
Significant Observed Adverse Effect Level (SOAEL)	Background Comparison	BS4142 Score greater than +5	Difference of up to +10 dB likely to be an indication of a significant adverse effect, depending on context Mitigate to achieve: BS4142 Score of + 5 or lower
	Assessment of Overall Change in Noise Levels	3.0 to 5.0 dB Change in Noise Levels at receptor of high sensitivity or Up to 5.0 dB Increase in Noise Levels	Mitigate to achieve: Increase in Noise Levels of less than 3.0 dB (high sensitivity) or Increase in Noise Levels of less than 5.0 dB (receptor of some sensitivity)

Effect Level	Assessment	Noise Level Criteria	Action / Justification
	Noise Intrusion Assessment	Noise levels are at: <i>Bedrooms: 50 dB L_{Amax}</i>	Mitigate and reduce to achieve: Bedrooms: 45 dB L_{Amax}
Unacceptable Observed Adverse Effect Level (UOAEI)	Background Comparison	BS4142 Score of + 10 or higher	Avoid, depending on context Mitigate to achieve: BS4142 Score of 5 dB or lower
	Assessment of Overall Change in Noise Levels	Greater than 5.0 dB Increase in Noise Levels	Mitigate to achieve: Increase in Noise Levels of less than 5.0 dB
	Noise Intrusion Assessment	Noise levels exceed: <i>Bedrooms: 50 dB L_{Amax}</i>	Mitigate and reduce to achieve: Bedrooms: 45 dB L_{Amax}

3.0 Assessment Methodology

3.1 Noise Modelling Methodology

Three-dimensional noise modelling has been carried out based on monitoring data recorded at and surrounding the application site. CADNA noise modelling software has been used. This model is based on ISO 9613 noise propagation methodology and allows for detailed prediction of noise levels to be undertaken for large numbers of receptor points and different noise emission scenarios, both horizontally and vertically.

The modelling software calculates noise levels based on the emission parameters and spatial settings that are entered. Input data, assumptions and model settings as given in the table below have been used.

Table 3.1 Modelling Parameters Sources and Assumptions

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels – around site	Ordnance Survey	Ordnance Survey
Ground levels – other areas	Site Observations and Ordnance Survey	OS 1:25,000 contours and OS 1:10,000 spot heights.
Building heights – around site	Tetra Tech Observations	8 m height for two storey residential properties, and 4 m for Bungalows
Barrier heights	Tetra Tech Observations	All existing barriers at observed height with the exception of hedges and trees which are assumed to offer no noise protection.
Receptor positions	Tetra Tech	1 m from façade, heights shown in Table 3.2
Plans	CHQ Architects	Drawing Title: Proposed Site Plan Rev: A Drawing Number: PL-A-2006

It is acknowledged that a number of these assumptions will affect the overall noise levels presented in this report. However, it should be noted that certain assumptions made, as identified above, are worst-case.

3.2 Model Input Data

3.2.1 GOL Loading Noise Data

Noise of a loading event has been known to vary from site to site by as much as 22 dB L_{Aeq} at 5 m distance even with the same vehicle type. Similarly, individual events using the same vehicle and at the same store have been recorded to vary by as much as 14 dB.

As such, the following worst-case calculations have been based on measurements of GOL delivery vans loading and delivering consumables. All measurements were undertaken in free-field conditions. In addition to noise from the unloading process, the levels used in the assessment include noise from the vehicle pulling up to the unloading bay, manoeuvring into position and then pulling away once unloading/loading is complete, together with other sources such as trolleys. The calculations are based on a maximum of one event per bay per hour and one GOL vehicle entering and leaving the external area per hour. For the purposes of this worst-case assessment, 40 vehicle movements per hour (to represent up to 20 vehicles leaving and 20 arriving per hour), and 100% unloading capacity during any given 15-minute period during the night-time hours (06:00-07:00). Loading events are modelled as point sources and vehicle movements as line sources.

GOL Delivery Vehicle Docking and Loading / Unloading

- *Daytime $L_{Aeq,60mins}$ Noise Level*

2 minutes at L_p 70.5 dB at 3 m distance	(vehicle arriving and manoeuvring)
36 minutes at L_p 61.9 dB at 3 m distance	(vehicle loading)
2 minutes at L_p 70.5 dB at 3 m distance	(vehicle leaving)

$$L_{Aeq(60 mins)} = 10\log(1/60)(2 \text{ mins} \times 1 \times 10^{0.1 \times 70.5 \text{ dB}} + 36 \text{ mins} \times 1 \times 10^{0.1 \times 61.9 \text{ dB}} + 2 \text{ mins} \times 1 \times 10^{0.1 \times 70.5 \text{ dB}})$$

$$= 62.2 \text{ dB at 3 m distance}$$

- *Night-time $L_{Aeq,15mins}$ Noise Level*

2 minutes at L_p 70.5 dB at 3 m distance	(vehicle arriving and manoeuvring)
36 minutes at L_p 61.9 dB at 3 m distance	(vehicle loading)
2 minutes at L_p 70.5 dB at 3 m distance	(vehicle leaving)

$$L_{Aeq(15 mins)} = 10\log(1/15)(2 \text{ mins} \times 1 \times 10^{0.1 \times 70.5 \text{ dB}} + 36 \text{ mins} \times 1 \times 10^{0.1 \times 61.9 \text{ dB}} + 2 \text{ mins} \times 1 \times 10^{0.1 \times 70.5 \text{ dB}})$$

$$= 68.3 \text{ dB at 3 m distance}$$

- *Night-time L_{Amax} Noise Level*

$$= 82.3 \text{ dB at 3 m distance}$$

Delivery Vehicle Parking

To represent noise from the proposed vehicle parking area, measurements of GOL vehicle were undertaken to represent noise from a GOL delivery vehicle manoeuvring and parking, switching off the engine and leaving the vehicle (including the closing of doors) followed by the reverse procedure (entering the vehicle, start-up and manoeuvring to the loading area); parking events are modelled as point sources.

- *Daytime $L_{Aeq,60mins}$ Noise Level*

200 seconds at L_p 66.3 dB at 3 m distance (vehicle arriving and manoeuvring, parking, starting up and departing)

$$L_{Aeq(60 \text{ mins})} = 10\log(1/60)(200 \text{ sec} \times 10^{0.1 \times 66.3 \text{ dB}})$$

$$= 53.7 \text{ dB at 3 m distance}$$

GOL Delivery Vehicles arriving and leaving along access route

The following calculations have been used to represent this as a line source in the model.

- *Daytime $L_{Aeq,60mins}$ Noise Level*

40 movements x 10 seconds at L_p = 69.3 dB at 3 m distance (vehicle arriving/leaving)

$$L_{Aeq(60 \text{ mins})} = 10\log(1/60)(40 \times 10 \text{ sec} \times 10^{0.1 \times 69.3 \text{ dB}})$$

$$= 59.8 \text{ dB at 3 m distance}$$

- *Night-time $L_{Aeq,15mins}$ Noise Level*

40 movements x 10 seconds at L_p = 69.3 dB at 3 m distance (vehicle arriving/leaving)

$$L_{Aeq(15 \text{ mins})} = 10\log(1/15)(40 \times 10 \text{ sec} \times 10^{0.1 \times 69.3 \text{ dB}})$$

$$= 65.8 \text{ dB at 3 m distance}$$

3.3 Sensitive Receptors

The table below summarises receptor locations that have been selected to represent worst-case residential receptors with respect to direct noise from noise at the site. Façades of the nearest existing dwellings to the development site have been represented. The locations of the receptors are shown on Figure 3.1 below.

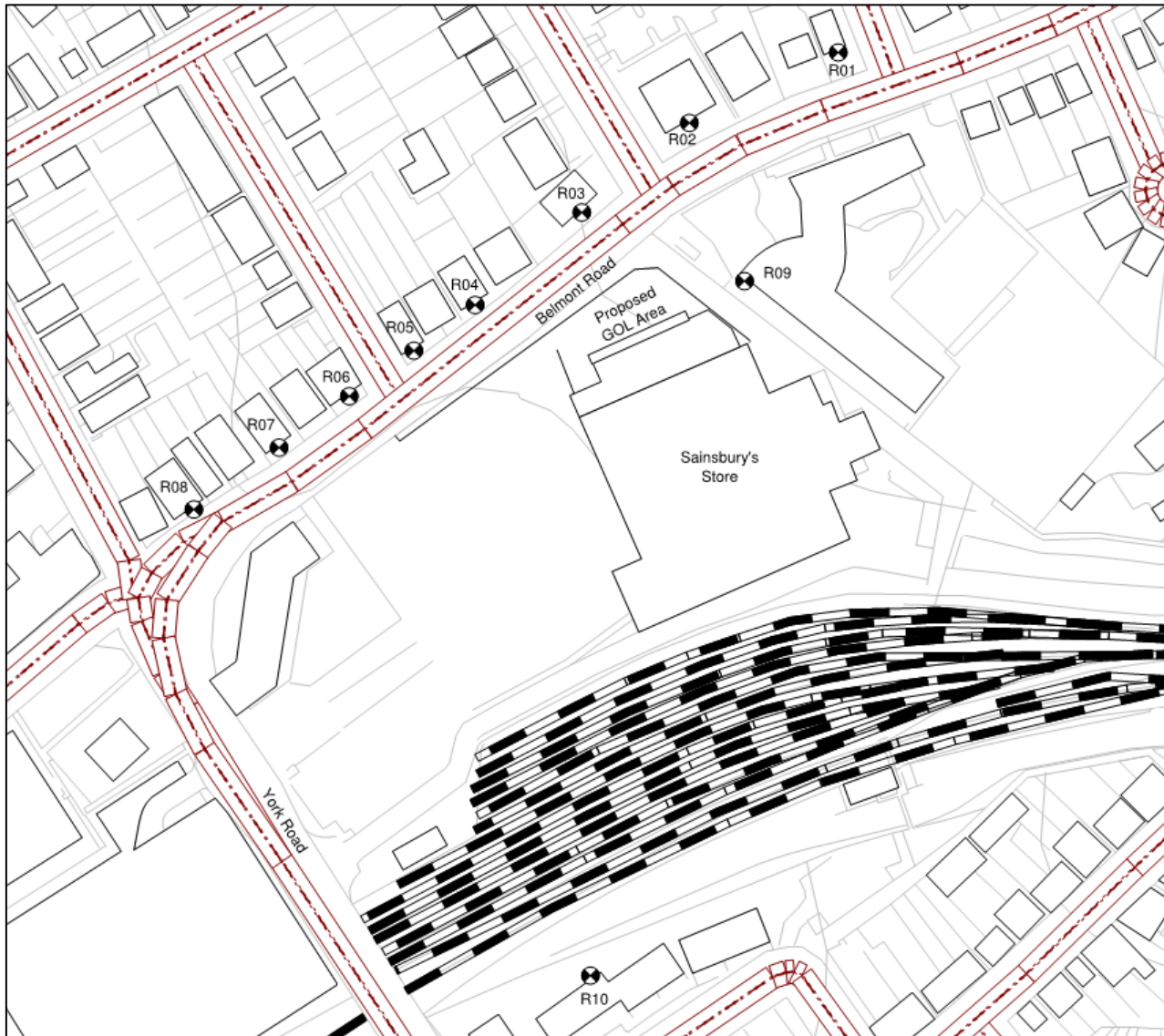
Table 3.2 Sensitive Receptor Locations

Ref.	Description	Height (m)
R01	1a Belmont Close	1.5 / 4.0
R02	Hampton Court, Fairfield Road	1.5 / 4.0
R03	111 Belmont Road	1.5 / 4.0
R04	107 Belmont Road	1.5 / 4.0
R05	97 Belmont Road	1.5 / 4.0
R06	95 Belmont Road	1.5 / 4.0
R07	85 Belmont Road	1.5 / 4.0
R08	71 Belmont Road	1.5 / 4.0
R09*	Hermitage Primary School	4.0

Ref.	Description	Height (m)
R10	20 Iffley Close	1.5 / 4.0

*School receptor assessed during daytime hours only

Figure 3.1 Proposed Sensitive Receptor Locations



4.0 Noise Survey

4.1 Noise Survey Methodology

A monitoring survey was undertaken to characterise baseline ambient noise levels currently experienced on the site and to establish the relative local background and traffic noise levels. Equipment used during the survey included:

Rion NL-52	Environmental Noise Analyser	s/n	843173
Rion NL-52	Environmental Noise Analyser	s/n	253702
Rion NL-52	Environmental Noise Analyser	s/n	732146
Rion NC-75	Sound Calibrator	s/n	35270131

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements, in accordance with recommended practice, a drift of +0.1 dB was observed. The accuracy of the calibrators can be traced to National Physical Laboratory Standards, calibration certificates for which are available on request.

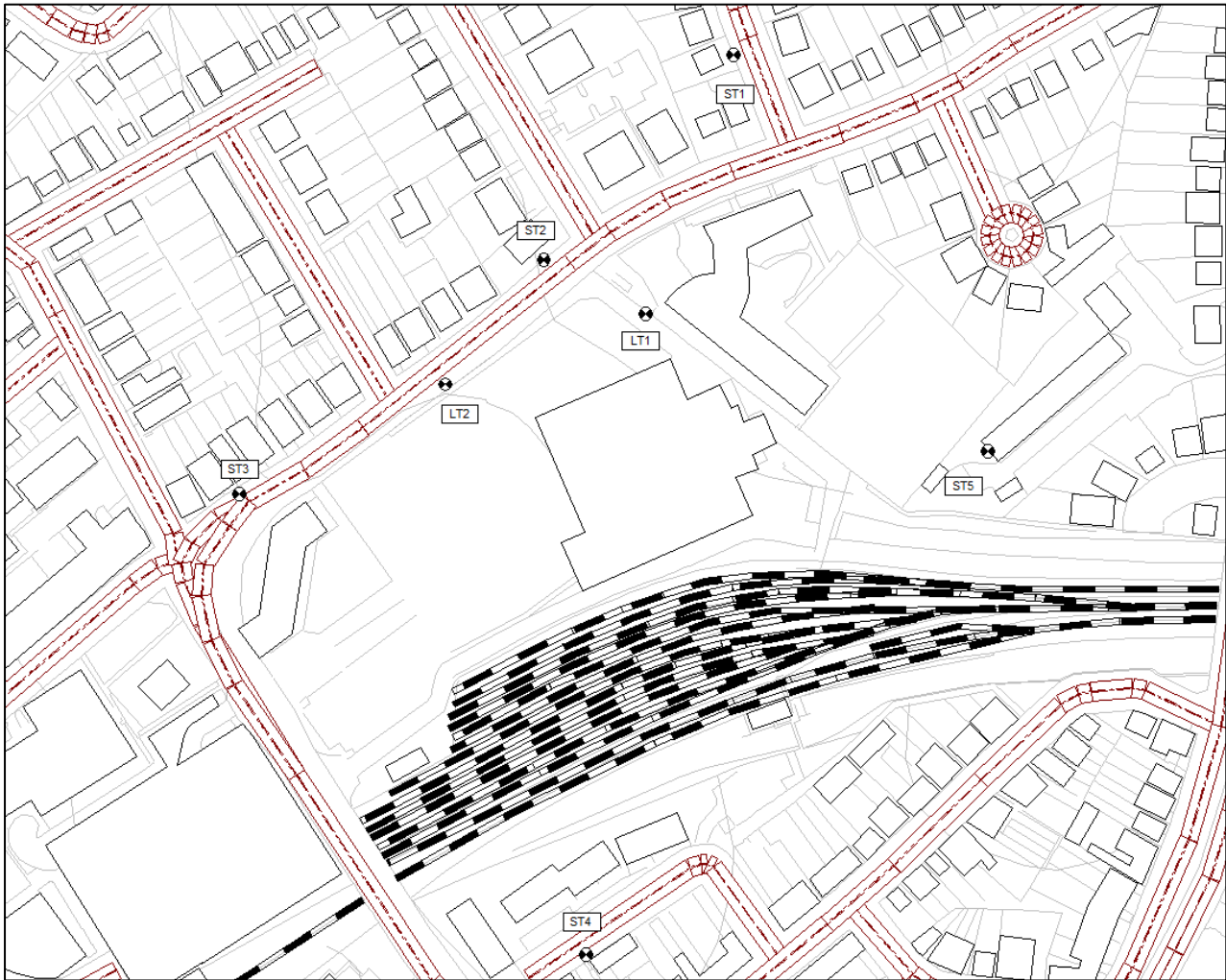
A baseline monitoring survey was undertaken at seven locations (as specified in the following table and shown in Figure 4.1) from Friday 8th January 2021 to Tuesday 12th January 2021. Attended short term measurements were undertaken at five locations during early morning, day, late evening and night periods with two additional locations being measured unattended over a 96-hour period. The raw data collected from the long-term monitoring is available upon request.

Measurements were taken in general accordance with BS 7445-1:2003 *The Description and Measurement of Environmental Noise: Guide to quantities and procedures*. Weather conditions during the survey period were observed as being dry. Anemometer readings confirmed that wind speeds were less than 5 ms⁻¹ at all times during the survey, with the wind varying between westerly and west-south westerly.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT1	Eastern boundary of the site, adjacent to Hermitage Primary School
LT2	Northern boundary of the site, opposite 109 Belmont Road
ST1	North-east of the site, adjacent 1 Belmont Close
ST2	North of the site, adjacent 111 Belmont Road
ST3	North-west of the site, adjacent 75 Belmont Road
ST4	South of the site, adjacent 18 Iffley Close
ST5	South-east of the site, adjacent 22 Heath Court

Figure 4.1 Noise Monitoring Locations



4.2 Noise Survey Results

The ambient noise climate is characterised by road traffic noise from Belmont Road and York Road, with occasional aircraft and noise from the nearby London Underground line and sidings with additional contributions from the existing Sainsbury's store.

Ambient and background noise levels are usually described using the L_{Aeq} index (a form of energy average) and the L_{A90} index (i.e. the level exceeded for 90% of the measurement period) respectively. Road traffic noise is generally described using the L_{A10} index (i.e. the level exceeded for 10% of the measurement period). For the long-term (LT) locations, the presented $L_{Aeq,T}$ and $L_{A10,T}$ are average noise levels whilst the L_{A90} is the modal noise level of each 5 minute measurement over the stated survey period.

Table 4.2 Meteorological Conditions during the Survey

Survey Location	Date & Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	Cloud Cover (Oktas)	Dominant Noise Source
Early morning ST1	12/01/2021 06:17	8	0 - 1	W	8	Road traffic noise Belmont Road
Early morning ST2	12/01/2021 06:01	8	0 - 1	W	8	Road traffic noise Belmont Road
Early morning ST3	12/01/2021 06:56	9	0 - 1	W	8	Road traffic noise Belmont Road
Early morning ST4	12/01/2021 07:16	9	0 - 1	W	8	Road traffic noise York Road
Early morning ST5	12/01/2021 06:36	9	0 - 1	W	8	Distant traffic noise
Day ST1	11/01/2021 15:18	8	0 - 3	WSW	7	Road traffic noise Belmont Road
Day ST2	11/01/2021 14:59	8	0 - 3	WSW	7	Road traffic noise Belmont Road
Day ST3	11/01/2021 14:42	8	0 - 1	WSW	7	Road traffic noise Belmont Road
Day ST4	11/01/2021 14:24	8	0 - 1	WSW	7	Road traffic noise York Road
Day ST5	11/01/2021 15:41	8	0 - 3	WSW	7	Distant traffic noise
Late evening ST1	11/01/2021 22:51	8	0 - 1	WSW	8	Road traffic noise Belmont Road
Late evening ST2	11/01/2021 23:31	8	0 - 1	WSW	8	Road traffic noise Belmont Road
Late evening ST3	11/01/2021 22:34	8	0 - 1	WSW	8	Road traffic noise Belmont Road, occasional aircraft
Late evening ST4	11/01/2021 22:15	8	0 - 1	WSW	8	Road traffic noise York Road, occasional aircraft
Late evening ST5	11/01/2021 23:12	8	0 - 1	WSW	8	Road traffic noise B483, occasional trains

The results of the statistical measurements and frequency measurements conducted during the survey are summarised in the following table. All values are sound pressure levels in dB (re: 2×10^{-5} Pa).

Table 4.3 Results of Baseline Noise Monitoring Survey (Average Levels)

Period	Duration (T)	Monitoring Date and Times	Location	L _{Aeq,T} (dB)	L _{Amax,T} (dB)	L _{Amin,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
Weekday Daytime 07:00 - 23:00	31 Hours	08/01/2021 – 12/01/2021 11:17 – 10:27	LT1	54.9	90.8	42.6	55.6	55.0
Weekday Night-time 23:00 – 07:00	16 Hours	08/01/2021 – 12/01/2021 23:00 – 07:00		52.5	68.3	42.0	52.7	49.0
Weekend Daytime 07:00 - 23:00	32 Hours	09/01/2021 – 10/01/2021 07:00 - 23:00		52.5	86.4	42.4	53.4	46.0
Weekend Night-time 23:00 – 07:00	16 hours	09/01/2021 – 10/01/2021 23:00 - 07:00		46.3	70.6	41.4	47.0	43.0

Period	Duration (T)	Monitoring Date and Times	Location	L _{Aeq,T} (dB)	L _{Amax,T} (dB)	L _{Amin,T} (dB)	L _{A10,T} (dB)	L _{A90,T} (dB)
Weekday Daytime 07:00 - 23:00	32 Hours	08/01/2021 – 12/01/2021 10:56 – 10:31	LT2	63.1	98.6	38.3	66.5	52.0
Weekday Night-time 23:00 – 07:00	16 hours	08/01/2021 – 12/01/2021 23:00 - 07:00		57.9	83.4	37.9	54.2	46.0
Weekend Daytime 07:00 - 23:00	32 Hours	09/01/2021 – 10/01/2021 07:00 - 23:00		62.2	105.8	38.8	63.6	50.0
Weekend Night-time 23:00 – 07:00	16 hours	09/01/2021 – 10/01/2021 23:00 - 07:00		53.9	81.5	36.1	48.8	39.0
Night-time and Early Morning 06:00 – 07:45	15 Mins	12/01/2021 06:17	ST1	54.1	67.6	49.9	57.0	51.4
	15 Mins	12/01/2021 06:01	ST2	64.6	83.4	47.6	66.5	49.4
	15 Mins	12/01/2021 06:56	ST3	65.4	83.8	48.7	69.0	51.9
	15 Mins	12/01/2021 07:16	ST4	52.7	63.1	48.6	54.6	50.5
	15 Mins	12/01/2021 06:36	ST5	52.8	62.1	50.0	53.9	51.5
Daytime 07:00 - 19:00	15 Mins	11/01/2021 15:18	ST1	55.7	76.7	48.9	56.8	51.1
	15 Mins	11/01/2021 14:59	ST2	63.0	78.9	50.0	67.0	52.4
	15 Mins	11/01/2021 14:42	ST3	64.0	79.2	52.4	68.0	55.4
	15 Mins	11/01/2021 14:24	ST4	53.8	68.2	48.6	55.7	50.5
	15 Mins	11/01/2021 15:41	ST5	54.5	74.4	50.5	56.0	52.5
Late Evening & Night-time 22:15 – 00:00	15 Mins	11/01/2021 22:51	ST1	48.8	66.7	44.1	48.6	45.7
	15 Mins	11/01/2021 23:31	ST2	59.8	82.7	41.8	57.4	44.3
	15 Mins	11/01/2021 22:34	ST3	61.5	80.1	45.2	61.7	47.5
	15 Mins	11/01/2021 22:15	ST4	49.3	62.7	43.5	52.3	45.5
	15 Mins	11/01/2021 23:12	ST5	49.3	65.2	44.3	51.5	46.1

All values are sound pressure levels in dB re: 2x 10⁻⁵ Pa

5.0 Assessment of Key Effects

5.1 BS 4142 Assessment

This assessment compares the predicted noise levels from the proposed GOL facility with the existing measured background noise levels (L_{A90}) at receptor locations representing nearby residential properties during the daytime period when GOL deliveries are proposed to be despatched from the new facility. The representative background noise level for each receptor has been established using measured noise level data from the nearest representative baseline survey locations.

Table 5.1 presents the difference between the background noise level and noise rating level associated with activities in GOL service yard, including parking and loading and unloading of vehicles. A subjective assessment of the characteristics of proposed noise sources has been undertaken in accordance with section 9.2 of BS4142. To account for potential impulsive characteristics of noise from the deliveries which may be perceptible at certain receptor locations, a + 3 dB correction has been added to noise associated with GOL operations.

Table 5.1 BS4142 Assessment – GOL Operations

Ref	Typical Measured Background L_{A90} Noise Level (dB)			Predicted Noise Level $L_{Aeq, 15 \text{ min}}$	Predicted Noise Level $L_{Aeq, 1 \text{ hour}}$	Noise Rating Level		BS 4142 Score		
	Early Morning 06:00 – 07:00	Daytime 07:00 – 19:00	Evening 19:00 – 23:00	Early Morning	Daytime/ Evening	Early Morning	Daytime/ Evening	Early Morning 06:00 – 07:00	Daytime 07:00 – 19:00	Evening 19:00 – 23:00
R01	53	46	46	37	33	40	36	-13	-10	-10
R02	53	46	46	42	36	45	39	-8	-7	-7
R03	51	50	46	48	41	51	44	0	-6	-2
R04	51	50	46	47	42	50	45	-1	-5	-1
R05	51	50	46	43	41	46	44	-5	-6	-2
R06	51	50	46	41	41	44	44	-8	-7	-3
R07	51	50	46	38	40	41	43	-10	-7	-3
R08	51	50	46	36	35	39	38	-13	-12	-8
R09*	n/a									
R10	51	51	46	25	39	28	42	-23	-9	-4

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

*School receptor, therefore outside the scope of BS 4142

The results presented in the table show that noise rating levels from the proposed GOL facility are predicted to be at or below background noise levels at the closest sensitive receptor locations during the proposed hours of operation. With reference to Table 2.1 above this is at or below the Lowest Observed Adverse Effect Level.

5.2 Change in Noise Level Assessment

This assessment has been undertaken to compare the 'existing ambient noise levels' (L_{Aeq}) to the 'proposed scheme' which combined existing ambient noise levels with worst-case noise levels from the development and the associated vehicle movements at identified existing residential receptors. The differences between the 'existing' and the 'proposed' development scenarios during the daytime and night-time are presented in tables 5.2-5.3 below. For illustrative purposes, a noise contour plot is presented in Figure 5.1.

Figure 5.1 Noise Contour Plot (Daytime) $L_{Aeq,1hour}$ – Grid Height: 1.5m



Table 5.2 Difference between 'Existing Noise Levels' and Proposed Scenarios Daytime L_{Aeq}

Ref.	Existing L_{Aeq} (monitored)	Combined L_{Aeq}	Contribution from Proposed Scheme
R01	52.5	52.5	0.0
R02	52.5	52.6	0.1
R03	62.2	62.2	0.0
R04	62.2	62.2	0.0
R05	62.2	62.2	0.0
R06	62.2	62.2	0.0
R07	62.2	62.2	0.0
R08	62.2	62.2	0.0
R09	52.5	53.7	1.2
R10	52.7	52.9	0.2

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

Table 5.3 Difference between 'Existing Noise Levels' and Proposed Scenarios Night-time L_{Aeq}

Ref.	Existing L_{Aeq} (monitored)	Combined L_{Aeq}	Contribution from Proposed Scheme
R01	46.3	47.1	0.8
R02	46.3	48.1	1.8
R03	53.9	55.1	1.2
R04	53.9	55.2	1.3
R05	53.9	55.1	1.2
R06	53.9	55.4	1.5
R07	53.9	55.4	1.5
R08	53.9	54.2	0.3
R09	n/a		
R10	49.3	50.3	1.0

All values are sound pressure levels in dB re: 2×10^{-5} Pa.

The results presented in the tables above show the change in noise levels between the existing monitored L_{Aeq} noise levels and the contribution from the proposed scenario. The differences between the 'existing' and 'proposed' scenario are no greater than 1.8 dB(A) at all receptors which is considered to be negligible (noise level changes of ± 3 dB are generally imperceptible to the human ear). Therefore, in terms of the change in noise level associated with store deliveries, noise effects fall within the No Observed Adverse Effect Level.

5.3 Noise Intrusion Assessment (Night-time L_{Amax} Noise Levels)

Table 5.4 below presents the external noise levels at nearby sensitive receptors from noise associated with GOL operations. Internal L_{Amax} noise levels (to represent noise from bangs and clatters) have been assessed both with windows open, where a reduction from a partially open window of 10 dB has been used, and with windows closed where an assumption of sound reductions of 30 dB has been used.

Table 5.4 Night-time Noise Intrusion Levels L_{Amax}

Location	External L_{Amax} at 1m from facade	Internal L_{Amax} with windows open	Internal L_{Amax} with windows closed	Criteria Internal L_{Amax}
R01	41.7	31.7	11.7	45
R02	46.6	36.6	16.6	45
R03	52.5	42.5	22.5	45
R04	51.5	41.5	21.5	45
R05	48.3	38.3	18.3	45
R06	45.3	35.3	15.3	45
R07	42.6	32.6	12.6	45
R08	39.6	29.6	9.6	45
R09	n/a			
R10	31.8	21.8	1.8	45

The assessment presented in the tables above demonstrate that internal L_{Amax} noise levels (which relate to the potential for sleep disturbance) within nearby dwellings from the proposed unloading/loading activities are predicted to be within the WHO noise intrusion criterion at all existing receptors with windows open and closed. As such, noise from GOL activity is not expected to result in adverse impacts relating to noise and would be within the No Observed Adverse Effect Level.

6.0 Conclusions

A noise assessment has been undertaken in support of a planning application for a proposed Grocery Online (GOL) area located at the existing Sainsbury's store at York Road, Uxbridge.

The NPPF provides test points against which the proposed development has been assessed. Considering these points, the following conclusions can be drawn:

NPPF paragraphs 170 (e) and 180 (a)

In considering paragraphs 170 and 180, an assessment has shown that predicted noise rating levels are predicted to be at or below existing background noise levels at all nearby sensitive receptor locations (on the basis of worst-case assumptions) and therefore, the proposed GOL facility is not expected to have an adverse impact and falls at or below the Lowest Observed Adverse Effect Level.

A change in noise level assessment which compares the existing ambient noise levels with the addition of the proposed combined noise levels has shown that noise levels are predicted to change by no more than 1.8 dB which is considered to be a negligible contribution.

Furthermore, an assessment of night-time L_{Amax} noise levels (from potential bangs and clatters) has shown that noise levels are predicted to be within the WHO criteria.

Overall, and when assessed even on a worst-case basis, the GOL facility is not expected to have an 'adverse impact' on health or quality of life.

NPPF paragraphs 180 (b), 182 & 183

Considering the existing use of the site as a supermarket, the proposed GOL facility is not expected to affect the tranquillity of the local area or access to areas of greater tranquillity.

Appendices

Appendix A – Acoustic Terminology and Abbreviations

Acoustic Terminology

- dB** Sound levels from any source can be measured in frequency bands in order to provide detailed information about the spectral content of the noise, i.e. whether it is high-pitched, low-pitched, or with no distinct tonal character. These measurements are usually undertaken in octave or third octave frequency bands. If these values are summed logarithmically, a single dB figure is obtained. This is usually not very helpful as it simply describes the total amount of acoustic energy measured and does not take any account of the ear's ability to hear certain frequencies more readily than others.
- dB(A)** Instead, the dBA figure is used, as this is found to relate better to the loudness of the sound heard. The dBA figure is obtained by subtracting an appropriate correction, which represents the variation in the ear's ability to hear different frequencies, from the individual octave or third octave band values, before summing them logarithmically. As a result the single dBA value provides a good representation of how loud a sound is.
- L_{Aeq}** Since almost all sounds vary or fluctuate with time it is helpful, instead of having an instantaneous value to describe the noise event, to have an average of the total acoustic energy experienced over its duration. The L_{Aeq, 07:00 – 23:00} for example, describes the equivalent continuous noise level over the 12 hour period between 7 am and 11 pm. During this time period the L_{pA} at any particular time is likely to have been either greater or lower than the L_{Aeq, 07:00 – 23:00}.
- L_{Amin}** The L_{Amin} is the quietest instantaneous noise level. This is usually the quietest 125 milliseconds measured during any given period of time.
- L_{Amax}** The L_{Amax} is the loudest instantaneous noise level. This is usually the loudest 125 milliseconds measured during any given period of time.
- L_n** Another method of describing, with a single value, a noise level which varies over a given time period is, instead of considering the average amount of acoustic energy, to consider the length of time for which a particular noise level is exceeded. If a level of x dBA is exceeded for say 6 minutes within one hour, then that level can be described as being exceeded for 10% of the total measurement period. This is denoted as the L_{A10, 1 hr} = x dB.
- The L_{A10} index is often used in the description of road traffic noise, whilst the L_{A90}, the noise level exceeded for 90% of the measurement period, is the usual descriptor for underlying background noise. L_{A1} and L_{Amax} are common descriptors of construction noise.
- R_w** The *weighted sound reduction index* determined using the above *measurement* procedure, but weighted in accordance with the procedures set down in BS EN ISO 717-1. Partitioning and building board manufacturers commonly use this index to describe the inherent sound insulation performance of their products.

Abbreviations

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

UDP – Unitary Development Plan

UKAS – United Kingdom Accreditation Service

Appendix B – Report Conditions

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