



Scottish Widows Property Authorised Contractual Scheme

Proposed Ancillary A3/A5 McDonalds Drive-Thru Victoria Retail Park, Victoria Road, South Ruislip Noise Assessment

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1	5 th March 2018	First Issue
2	9 th March 2018	Second Issue - Minor Amendments
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1.0 Introduction

1.1 Purpose of this Report

This report presents the findings of a noise assessment undertaken for a drive-thru restaurant at Victoria Retail Park, South Ruislip. This report considers the potential noise impact of the following noise sources:

- New Building Services Plant
- Drive-thru Movements
- Customer Noise
- Deliveries
- Intercom Conversation

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 CRTN and 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 are presented in Appendix B.

1.2 Legislative Context (England)

This report is intended to provide information relevant to the local planning authority and their consultees in support of a planning application for the above proposed development. Policy guidance with respect to noise is found in National Planning Policy Framework. With regard to noise and planning, NPPF contains the following 4 short statements (section 123):

- Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;
- Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions;
- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and
- Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.



The Planning Practice Guidance (PPG): Noise web-based resource was launched by the Department for Communities and Local Government (DCLG) on 6 March 2014 to support the National Planning Policy Framework and make it more accessible. With respect to noise, the PPG provides the following summary of the effects of noise exposure:

Table 1.1 Noise Exposure Hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Action
Not noticeable	No Effect	No Observed Effect	No Specific Measures Required
Noticeable and not intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No Specific Measures Required
Lowest Observed Adverse Effect Level			
Noticeable and intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, e.g. turning up volume of television; speaking more loudly; closing windows for some of the time because of the noise. Potential for non-awakening sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, e.g. having to keep windows closed most of the time, avoiding certain activities during periods of intrusion. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory	Unacceptable Observed Adverse Effect	Prevent

2.0 Assessment Criteria

In order enable the assessment of the proposed development 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 standards and design guidance:

BS 4142:2014, 'Methods for rating and assessing industrial and commercial sound'

World Health Organisation: *Guidelines on Community Noise (1999)*

IEMA (Institute for Environmental Management and Assessment) '*Guidelines for Environmental Noise Impact Assessment October 2014*'



Table 2.1 Change in Noise Level Criteria and Actions (Overall & Drive-Thru Assessment)

Effect Level	Noise Level Criteria	Action / Justification
No Observed Adverse Effect	Up to 3.0 dB Change or a Reduction in Noise Levels	No Action Required – Change in noise levels unlikely to be perceptible
Lowest Observed Adverse Effect Level (LOAEL)	Up to 4.9 dB Increase in Noise Levels	No Action Required Slight Impact at Receptor of Some Sensitivity
Significant Observed Adverse Effect Level (SOAEL)	3.0 to 5.0 dB Change in Noise Levels at receptor of high sensitivity or Greater than 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)
Unacceptable Observed Adverse Effect Level (UOAE)	Greater than 5.0 dB Increase in Noise Levels	Mitigate to achieve: Increase in Noise Levels of less than 5.0 dB

Table 2.2 Noise Level Criteria and Actions (Plant & Delivery Noise Assessment)

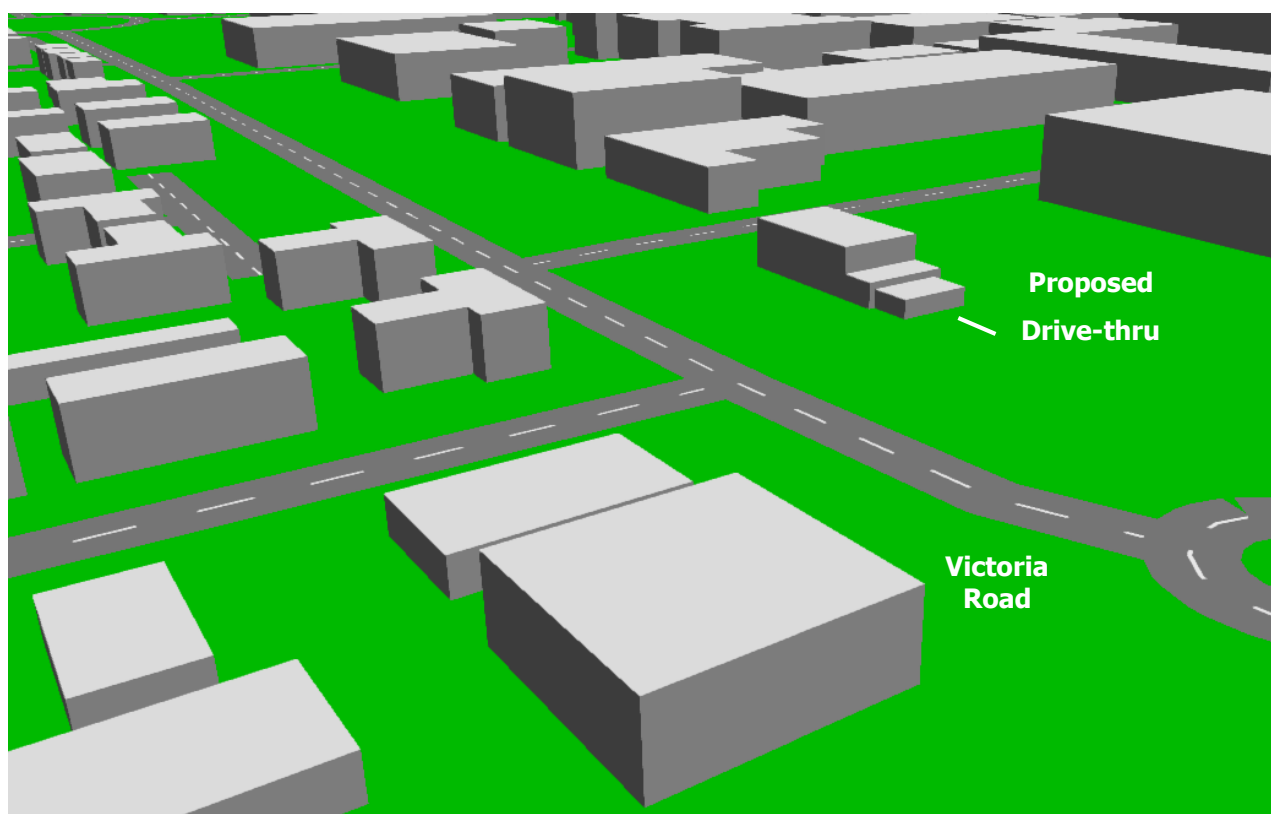
Effect Level	Noise Level Criteria	Action / Justification
No Observed Adverse Effect Level (NOAEL)	BS4142 Score of zero or lower	No Action Required Score of zero or lower is an indication of the sound source having a low impact
Lowest Observed Adverse Effect Level (LOAEL)	<i>BS4142 Score of plus 5</i>	Difference of +5dB likely to be an indication of an adverse effect Mitigate to achieve: BS4142 Score of plus 5 or lower
Significant Observed Adverse Effect Level (SOAEL)	BS4142 Score of plus 10 or higher	Difference of +10dB likely to be an indication of a significant adverse effect Mitigate to achieve: as low as possible
Unacceptable Observed Adverse Effect Level (UOAE)	BS4142 Score of plus 10 or higher with mitigation	Avoid Mitigate to achieve: as low as possible

3.0 Assessment Methodology

3.1 Noise Modelling Methodology

Three-dimensional noise modelling has been undertaken based on the monitoring data to predict source noise levels at a large number of locations both horizontally and vertically. 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.

Figure 3.1 CADNA Noise Model



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 Table 3.1 have been used.

Table 3.1 Modelling Parameters Sources and Assumptions

Parameter	Source	Details
Horizontal distances – around site	Ordnance Survey	Ordnance Survey
Ground levels	Ordnance Survey	OS panorama contours
Building heights	WYG Observations	4m height for one storey and 8 m height for two storey properties, 3m per additional storey
Receptor positions	WYG	1 m from façade, height of 1.5 m for ground floor, 4 m for first floor
Barriers	WYG / Space	None other than 1.5m barrier around plant area on roof (3.0 barrier - mitigation)
Reflections	WYG	First order reflections have been applied based on mirror image sources
Absorbent Ground	CADNA	Frequency dependant ground absorption has been applied based on values specified in VDI 2714/16 clause 6.3.
Proposed Plan	URBANEDGE	Drawing Title: Site Block Plan Drawing Number: URB DT[08] 00 03 Revision D00 Dated: Feb 2018

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 Drive-thru and Customer Noise

Noise associated with the proposed drive-thru will consist of, intercom conversations between restaurant staff and customers, idling vehicle engine noise as well as engine noise from vehicles pulling off. Noise measurements of a diesel engine car have been taken for pulling off, additionally noise measurements of an intercom from a McDonalds drive-thru has been used. These measurements have been used as proposed noise levels within the noise assessment model, it is assumed that the following sources will be operating (as a worst-case) continuously and simultaneously.

Traffic data provided by WYG identifies that at peak times, there will be 136 customer vehicle movements per hour, during the day-time and 36 customer vehicle movements per hour, during the night-time. A worst-case scenario has been modelled which assesses the drive-thru at maximum capacity, with 18 customer vehicles idling at the drive-thru (during the day-time peak) and 9 customer vehicles idling at the drive thru (during the night-time peak).

Consideration has also been given to worst-case numbers of pedestrian movements associated with the development based upon observations of similar facilities, with an assumption of 300 customer pedestrian movements per hour. Each movement was estimated to be a maximum duration of 5 seconds (passing by a given location). The calculations determine the $L_{Aeq,1hour}$ based on the above assumptions and noise



measurements. As the proposed drive-thru is expected to be operational 24-hours, an assessment for day time and night-time has been carried out. For details of the calculations, refer to Appendix C.

3.2.2 Delivery Event Noise Data

The noise sources included within the model, includes the unloading and movement of roll cages from a delivery. The calculations used are based on a maximum of one event per hour with deliveries occurring during the daytime and night-time period. It is understood that the unloading of the deliveries, to the proposed development, will be received at the western entrance. For details of the calculations, refer to Appendix C.

3.2.3 Summary of Model Input Data

A summary of the noise levels used for each noise source, within the model are presented in Table 3.2 below. Details of each noise source are further discussed in the following sub-sections, the calculations for the noise levels shown in Table 3.2, are presented within Appendix C.

Table 3.2 Summary of Noise Source, Noise levels during Daytime & Night-time

Noise Source	Noise Level (dB)	
	Daytime <small>L_{Aeq}, 1hour</small>	Night-time <small>L_{Aeq} 1hour</small>
Drive-Thru - Customer Cars Pulling Off	56.9 dB @ 2m	51.2 dB @ 2m
Drive-Thru - Customer Cars Idling	62.7 dB @ 2m	59.7 dB @ 2m
Drive Thru - Intercom	78.9 dB @ 0.5m	73.2 dB @ 0.5m
Customer Pedestrian Movements	38.2 dB @ 3m	38.2 dB @ 3m
Delivery Noise	62.2 dB @ 3m	*63.7 dB @ 3m

*L_{Aeq}, 15mins

3.2.4 Building Services Plant

Point sources have been used in the model to represent the proposed roof mounted building services plant associated with the scheme. The maximum sound pressure levels of the point sources at 1 and 3 metres were estimated in the model as a conditional maximum level that the noise levels at nearby receptors were predicted to meet the BS 4142 assessment criteria. Noise emission limits have been specified to ensure that the cumulative plant noise rating levels are at least 10 dB below existing daytime and night-time background noise levels at all closest sensitive receptor locations; the sound pressure levels suggested are indicative and subject to final design.



3.3 Sensitive Receptors

Table 3.3 summarises locations that have been selected to represent worst-case residential receptors with respect to direct noise from the proposed store. Ground and first floor façades of the nearest noise sensitive properties have been represented. The locations of the receptors are shown on SK02 in Appendix B.

Table 3.3 Receptor Locations

Ref.	Description	Closest Source	Approximate Distance To Source (m)	Height Daytime/Night-time (m)
R01	6, Queens Walk	Drive-Thru	42.0	1.5
R02	8a, Queens Walk	Drive-Thru	66.0	1.5 / 4.0
R03	4, Queens Walk	Drive-Thru	41.0	1.5 / 4.0
R04	805, Victoria Road	Drive-Thru	43.0	1.5 / 4.0
R05	817, Victoria Road	Drive-Thru	87.0	1.5 / 4.0
R06	823, Victoria Road	Drive-Thru	107.0	1.5 / 4.0
R07	835, Victoria Road	Drive-Thru	130.0	1.5 / 4.0
S1	Queensmead School (Southern Façade), Queens Walk	Drive-Thru	79.0	1.5
S2	Queensmead School (Eastern Façade), Queens Walk	Drive-Thru	80.0	1.5
S3	Queensmead School House, Queens Walk	Drive-Thru	52.0	1.5



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	1043466
Rion NL-52	Environmental Noise Analyser	s/n	253702
Rion NC-74	Sound Calibrator	s/n	35046823

The measurement equipment was checked against the appropriate calibrator at the beginning and end of the measurements in accordance with recommended practice and no drift 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 SK01 of Appendix B) from Tuesday 20th February 2018 to Tuesday 27th February 2018. Attended short term measurements were undertaken at six locations during the day, evening, night-time and early morning periods, with one additional location being measured unattended over a 161-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 with predominantly broken cloud cover. Anemometer readings confirmed that wind speeds were less than 5 ms⁻¹ at all times during the survey with a predominant easterly wind direction.

Table 4.1 Noise Monitoring Locations

Ref	Description
LT1	Corner of Stonefield Way / Victoria Road
ST1	Victoria Road – opposite DFS car park
ST2	Queens Walk – opposite 'The Bungalow'
ST3	Diamond Road – on bend outside number 51
ST4	Cul-de-sac opposite 809 Victoria Road
ST5	Victoria Road – next to bus stop outside Queensmead School
ST6	Entrance to Currys/PC World car park

4.2 Noise Survey Results

The main noise sources in the area were from road traffic along Victoria Road as well as Field End Road and Eastcote Lane to the east. Occasional traffic could be heard on the residential side streets. Traffic movements could be heard from the parking areas of Victoria Retail Park. Noise could be heard from pedestrians including children being picked up from and going home from school during the survey period. Occasional aircraft noise could be heard; the aircraft were commercial jets from Heathrow rather than military ones from RAF Northolt. During the early morning survey period some bird noise could be heard.

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).

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
Evening ST1	26/02/2018 22:19	-2.0 °C	0-1 m/s	-	2	Road traffic noise from Victoria Road. Occasional aircraft noise.
Evening ST2	26/02/2018 21:04	1.0 °C	0-1 m/s	-	2	Road traffic noise from Victoria Road and occasionally Queens Walk. Aircraft noise.
Evening ST3	26/02/2018 21:41	-2.0 °C	0-1 m/s	-	2	Road traffic noise from Victoria Road. Only 2 cars passing on Diamond Road. Occasional aircraft noise.
Evening ST4	26/02/2018 22:01	-2.0 °C	0-1 m/s	-	2	Road traffic noise from Victoria Road. Occasional aircraft noise.
Evening ST5	26/02/2018 21:22	1.0 °C	0-1 m/s	-	2	Road traffic noise from Victoria Road. Occasional aircraft noise.
Night-time ST1	26/02/2018 23:50	-2.0 °C	1-2 m/s	E	2	Road traffic noise from Victoria Road. Other distant traffic.
Night-time ST2	26/02/2018 23:00	-2.0 °C	0-1 m/s	-	2	Road traffic noise from Victoria Road. Occasional aircraft noise.
Night-time ST3	26/02/2018 23:16	-2.0 °C	0-1 m/s	-	2	Road traffic noise from Victoria Road. Occasional aircraft noise. Distant traffic noise from east (Field End Road / Eastcote Lane).
Night-time ST4	26/02/2018 23:33	-2.0 °C	1-2 m/s	E	2	Road traffic noise from Victoria Road. Possible plant / generator noise from Lidl.
Early morning ST1	27/02/2018 06:51	-3.0 °C	0-1 m/s	-	0	Road Traffic noise from Victoria Road. Bird song.
Early morning ST2	27/02/2018 06:00	-3.0 °C	0-1 m/s	-	1	Road traffic noise from Victoria Road. Seagulls. Occasional aircraft. Boiler vent.
Early morning ST3	27/02/2018 06:17	-3.0 °C	0-1 m/s	-	0	Road traffic noise from Victoria Road. Distant traffic noise – mainly from the east (Field End Road / Eastcote Lane). Occasional aircraft. Bird song.



Survey Location	Date & Time	Temperature (°C)	Wind Speed (m/s)	Wind Direction	Cloud Cover (Oktas)	Dominant Noise Source
Early morning ST4	27/02/2018 06:34	-3.0 °C	0-1 m/s	-	0	Road traffic noise from Victoria Road.

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). For the long-term (LT) location, 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 4.3 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	74 Hours	20/02/2018 - 27/02/2018 07:00 - 23:00	LT1	59.1	98.1	41.1	60.6	55.0
Weekday Night-time 23:00 - 07:00	39 Hours	20/02/2018 - 27/02/2018 23:00 - 07:00		54.1	89.5	29.4	54.8	44.0
Weekend Daytime 07:00 - 23:00	32 Hours	24/02/2018 - 25/02/2018 07:00 - 23:00		57.5	90.7	39.1	59.1	55.0
Weekend Night-time 23:00 - 07:00	16 Hours	24/02/2018 - 25/02/2018 23:00 - 07:00		53.2	87.2	35.4	55.0	39.0
Daytime 07:00 - 19:00	15 Mins	26/02/2018 14:37	ST1	69.6	93.6	54.6	72.2	62.0
		26/02/2018 15:28	ST2	59.1	85.3	44.3	62.2	49.1
		26/02/2018 15:10	ST3	54.7	70.9	43.8	57.0	46.8
		26/02/2018 14:54	ST4	58.9	77.6	50.0	61.3	54.3
		26/02/2018 15:45	ST5	64.1	80.7	51.9	66.6	59.6
		26/02/2018 14:13	ST6	60.7	77.5	49.7	62.8	53.5
Evening 19:00 - 23:00	15 Mins	26/02/2018 22:19	ST1	65.6	80.7	41.4	70.6	48.6
		26/02/2018 21:04	ST2	52.0	70.4	38.2	53.3	41.7
		26/02/2018 21:41	ST3	43.4	61.4	38.6	43.4	40.0
		26/02/2018 22:01	ST4	56.3	67.0	40.6	59.3	47.5
		26/02/2018 21:22	ST5	62.8	80.9	45.4	66.2	53.9
Night-time 23:00 - 07:00	15 Mins	26/02/2018 23:50	ST1	61.6	80.2	35.4	63.6	39.8
		26/02/2018 23:00	ST2	43.2	63.6	32.1	46.0	35.5
		26/02/2018 23:16	ST3	40.6	58.4	34.8	41.5	36.7
		26/02/2018 23:33	ST4	51.6	66.1	35.2	55.7	38.2
Early morning 6:00 - 07:00	15 Mins	27/02/2018 06:51	ST1	69.0	82.8	51.9	73.4	56.4
		27/02/2018 06:00	ST2	48.9	66.5	35.3	50.7	40.7
		27/02/2018 06:17	ST3	48.5	66.0	38.8	51.2	40.6
		27/02/2018 06:34	ST4	59.1	73.0	45.8	61.3	53.3

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

5.0 Assessment of Key Effects

5.1 Building Services Plant Noise Assessment

This assessment has been undertaken in order to establish the maximum external noise levels from the proposed roof mounted building services plant at the site. The assessment compares the predicted worst-case breakout noise levels from the roof mounted external plant with the existing measured modal background noise L_{A90} at the closest proposed and existing residential receptors; a 1.5m high barrier has been included within the assessment, surrounding the plant.

A series of predictions were made by defining different sound power levels at a point source. When the sound pressure levels are set as shown in Tables 5.1. These are considered achievable, however the sound pressure levels suggested are indicative and subject to final design. The noise levels at all the existing receptors are predicted to be at least 10 dB below existing background levels during the daytime and night-time as shown in Table 5.2. All predicted rating noise levels fall within the Lowest Observed Adverse Effect Level. To account for any tonal and intermittent elements associated with the noise from the proposed roof mounted BSP that may be just perceptible at receptor, a +5 dB correction has been applied to create the rating noise level in line with section 9.2 of BS4142:2014.

Table 5.1 Proposed Emission Limits for BSP as Modelled

BSP Description	Indicative Noise Emission Limit - Sound Pressure Level	
	Daytime	Night-time
Restaurant AHU & Kitchen Extract Roof Mounted Plant	80.7 dB(A) at 1 m OR 71.1 dB(A) at 3 m	64.3 dB(A) at 1 m OR 54.7 dB(A) at 3 m
Crew/Office/Chiller/Freezer Condensers Roof Mounted Plant	53.4 dB(A) at 1 m OR 43.8 dB(A) at 3 m	36.3 dB(A) at 1 m OR 26.7 dB(A) at 3 m

Table 5.2 BS4142 Assessment for Proposed Plant

Location	Measured Background L_{A90}		Rating level from plant		BS 4142 Score	
	Daytime	Night-time	Daytime	Night-time	Daytime	Night-time
R01	55	39	43	26	-12	-13
R02	49	36	37	23	-12	-13
R03	55	39	46	30	-10	-10
R04	55	39	44	28	-11	-11
R05	54	38	40	24	-14	-14
R06	54	38	39	22	-16	-16
R07	54	38	38	21	-17	-17
S1	60	n/a	39	n/a	-21	n/a
S2	60	n/a	39	n/a	-21	n/a
S3	60	n/a	41	n/a	-18	n/a

All values are sound pressure levels in dBA re: 2×10^{-5} Pa. The modal value has been used for the measured L_{A90} background noise levels for day time and night-time.

5.2 Overall Change in Noise Level Assessment

An assessment has been undertaken to compare worst-case noise levels from the 'existing ambient noise levels' (L_{Aeq}) to the 'proposed scheme' noise at identified existing residential receptors. The differences between the 'existing' and the 'proposed' development scenarios including, as identified in Section 3.2, building services plant, deliveries and drive-thru operations during the daytime and night-time are presented in the following tables. For illustrative purposes, a noise contour plot is presented in SK03 in Appendix B.

Table 5.3 Difference between Existing Conditions and Contribution from Proposed Development (Daytime L_{Aeq})

Ref.	Existing L_{Aeq} (monitored)	Predicted Drive-thru Noise Levels L_{Aeq} (modelled)	Combined L_{Aeq}	Contribution from Proposed Scheme
R01	57.5	48.2	58.0	0.5
R02	59.1	45.4	59.3	0.2
R03	57.5	50.8	58.3	0.8
R04	57.5	49.1	58.1	0.6
R05	58.9	43.8	59.0	0.1
R06	58.9	43.1	59.0	0.1
R07	58.9	41.7	59.0	0.1
S1	59.6	43.8	59.7	0.1
S2	59.6	43.5	59.7	0.1
S3	59.6	46.8	59.8	0.2

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

Table 5.4 Difference between Existing Conditions and Contribution from Proposed Development (Night-time L_{Aeq})

Ref.	Existing L_{Aeq} (monitored)	Predicted Drive-thru Noise Levels L_{Aeq} (modelled)	Combined L_{Aeq}	Contribution from Proposed Scheme
R01	53.2	44.7	53.8	0.6
R02	43.2	40.4	45.0	1.8
R03	53.2	46.6	54.1	0.9
R04	53.2	44.8	53.8	0.6
R05	51.6	38.5	51.8	0.2
R06	51.6	37.8	51.8	0.2
R07	51.6	36.5	51.7	0.1

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 modelled L_{Aeq} noise levels and the contribution from the proposed scenario during the daytime and night-time. 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).



Notwithstanding the favourable assessment presented above, Tables D1 – D3 within Appendix D present the predicted change in hourly ambient noise levels (L_{Aeq}) during weekday and weekend periods at the nearest residential dwellings.

The assessment shows that the maximum hourly change in noise levels between the existing ambient L_{Aeq} noise levels and the contribution from the proposed drive-thru and customer movements 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).

5.3 BS 4142 Delivery Assessment

The assessment, presented in Tables E1- E3 within Appendix E, compares existing typical hourly background noise levels (L_{A90}) during the proposed hours of operation (24-hours) with predicted noise from deliveries at the nearest residential dwellings. In order to account for any potential intermittency of noise from the unloading process, a +3 dB correction has been added before comparison with background levels to create the noise rating level.

The assessment shows that noise rating levels from deliveries are predicted to be below or equal to hourly background noise levels, during the daytime and night-time hours Monday – Sunday except between the hours of 02:00 - 03:00 on Saturdays, when it noise rating levels from deliveries are predicted be no more than 1dB above background. Therefore, noise levels from deliveries fall within the Lowest Observed Adverse Effect Level (LOAEL).

5.4 Tranquillity Assessment

The site is currently in use as a retail park/car park and located adjacent to Victoria Road which was observed to be in-use by multiple vehicle types (including cars, motorbikes, buses and HGVs during all periods). Therefore, the proposed drive-thru is not expected to adversely affect the tranquillity rating of the local area or access to areas of greater tranquillity.



6.0 Conclusions of Noise Assessment

A noise report has been undertaken to assess the impact of a proposed drive-thru at Victoria Retail Park, South Ruislip. Section 123 of the NPPF gives points relating to noise which are referenced as bullet points below. Considering each of these points, the following conclusions can be drawn in relation to the proposed drive-thru operations:

- *avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development*

An assessment to determine the change in hourly ambient noise levels has shown that the worst-case use of the drive-thru and customer noise will result in a negligible increase in overall ambient noise levels. Furthermore, an assessment of noise from deliveries to the proposed drive-thru has shown that noise rating levels at all receptors are predicted to be below or around background noise levels during both daytime and night-time periods, as such is expected to have a low impact.

- *mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from new development, including through the use of conditions*

Noise levels from the new building services plant have been specified to achieve noise rating levels below existing background noise levels at all receptors. Therefore, the proposals will not have a 'significant adverse impact' on health or quality of life.

- Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established; and

Assessments of the overall change in noise levels have shown that there is expected to be a negligible increase in overall noise levels at nearby properties, as such existing businesses are not expected to be restricted by the proposed development.

- *identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason*

The site is currently in use as a retail park/car park. Therefore, the proposed drive-thru will not affect the tranquillity rating of the local area or access to areas of greater tranquillity.

Appendices

Appendix A – Acoustic Terminology and Abbreviations

An explanation of the specific acoustic terminology referred to within this report is provided below.

- 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.

An explanation of abbreviations used within this report is provided below.

CADNA – Computer Aided Noise Abatement

DMRB – Design Manual for Roads and Bridges

HGV – Heavy Goods Vehicle

PPG – Planning Practice Guidance

UDP – Unitary Development Plan

UKAS – United Kingdom Accreditation Service

NPPF – National Planning Policy Framework

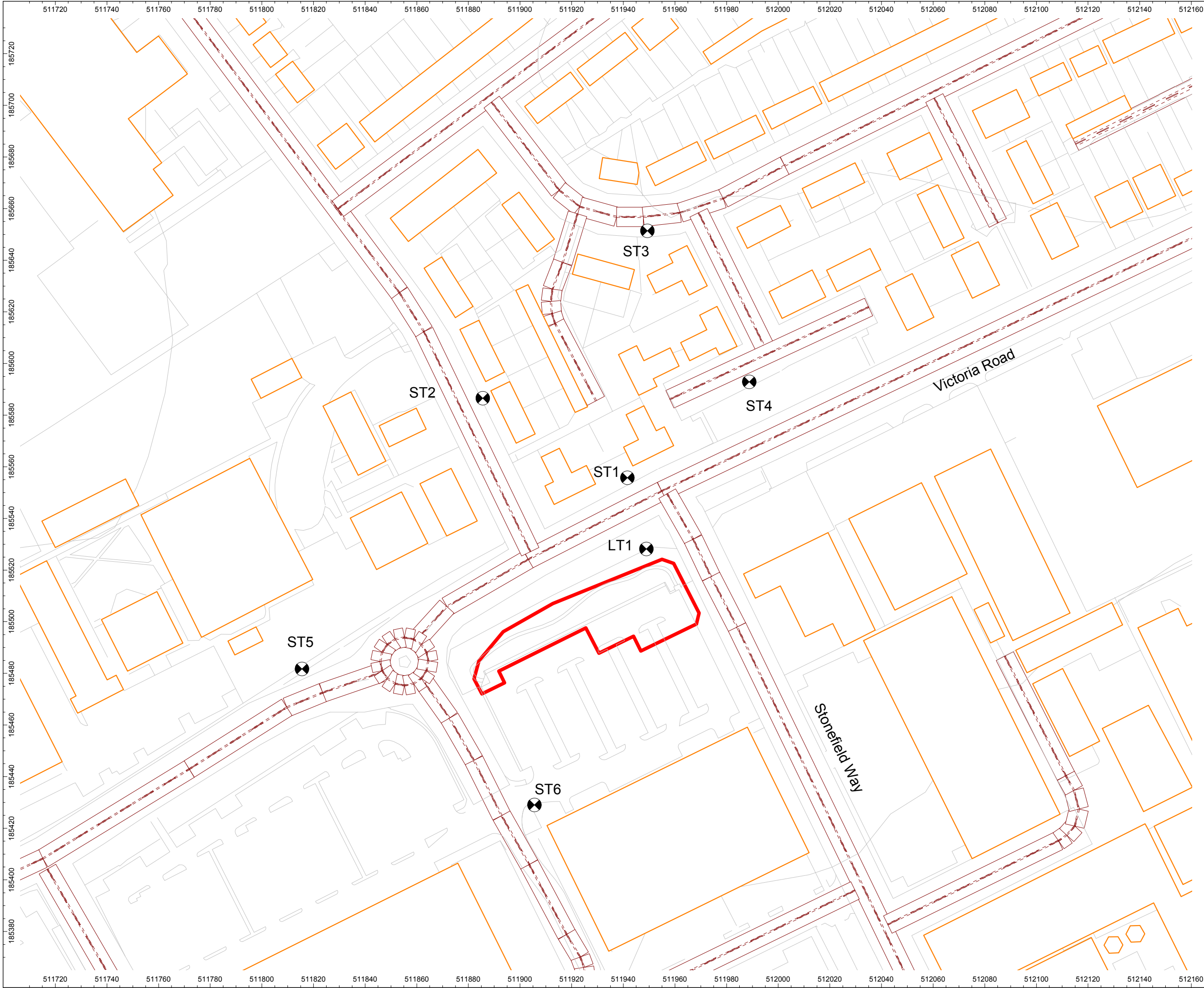
NOAEL – No Observed Adverse Effect Level

LOAEL – Lowest Observed Adverse Effect Level

SOAEL – Significant Observed Adverse Effect Level

Appendix B – Sketches

- SK01 Noise Monitoring Location Plan
- SK02 Existing Sensitive Receptor Location Plan
- SK03 Combined Worst Case $L_{Aeq,1hour}$ Source Noise Levels



Client:
Scottish Widows Property
Authorised Contractual
Scheme 1

Project:
Proposed Drive Thru
Victoria Park
South Ruislip

Project Number:
A095837

Drawing Title / Scenario:
Noise Monitoring Locations

Drawing Number:
SK01

Key:

Site Boundary: —

Scale : Not to scale

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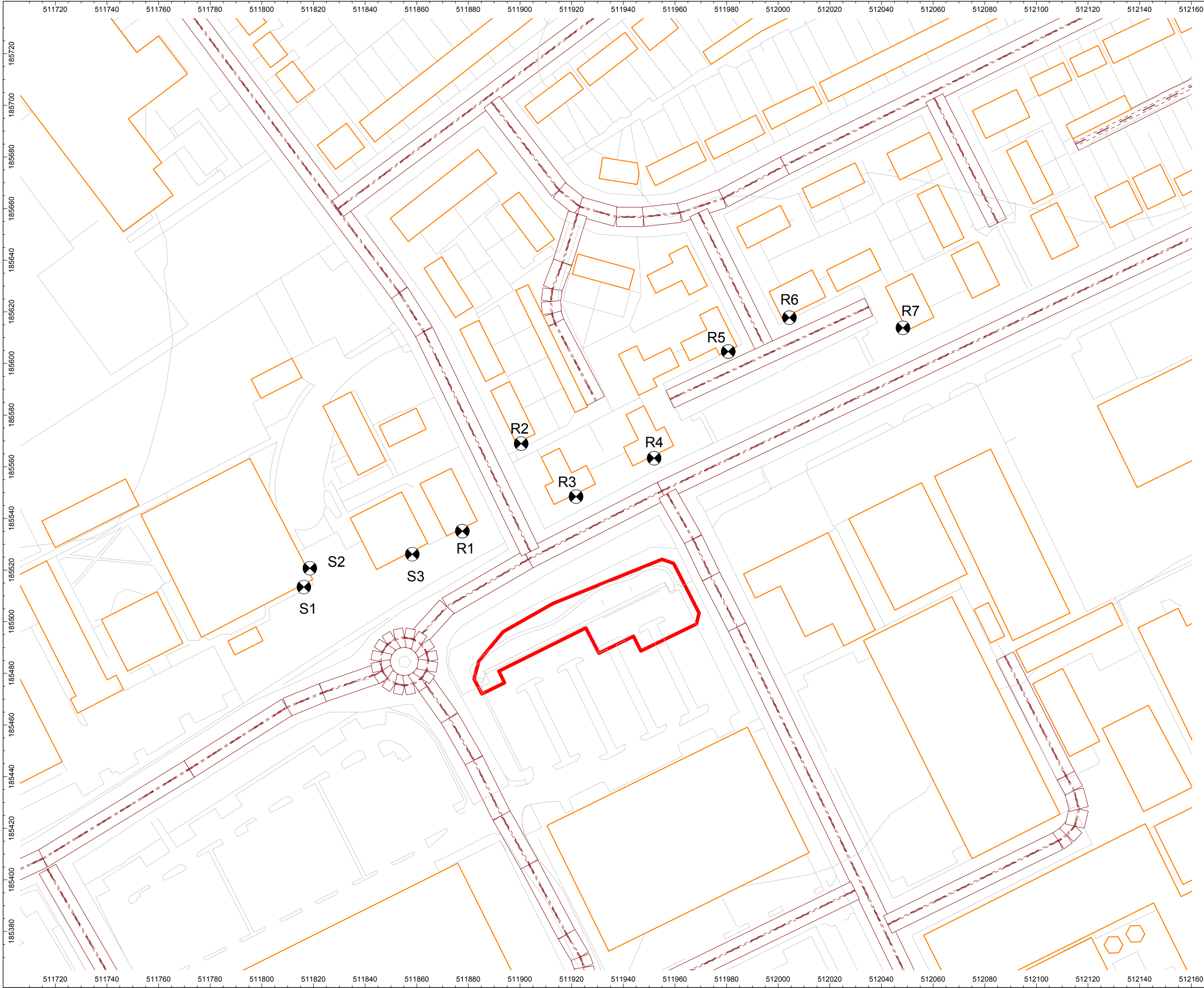
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Client:
**Scottish Widows Property
Authorised Contractual
Scheme 1**

Project:
**Proposed Drive Thru
Victoria Park
South Ruislip**

Project Number:
A095837

Drawing Title / Scenario:
**Existing Sensitive
Receptor Locations**

Drawing Number:
SK02

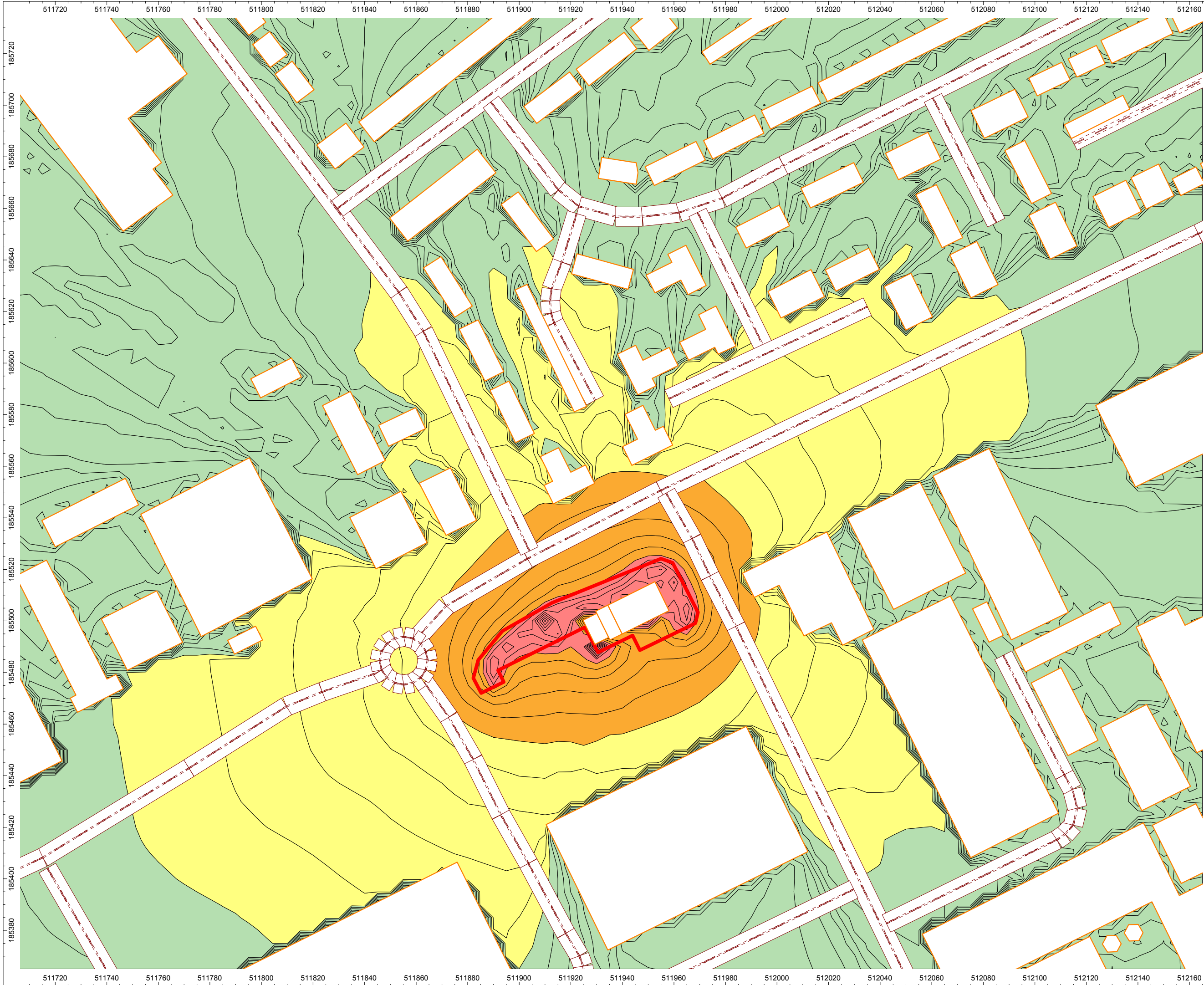
Key:
Site Boundary: —

Scale : Not to scale

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Leicestershire
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Tel 0116 234 8000
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Client:
Scottish Widows Property
Authorised Contractual
Scheme 1

Project:
Proposed Drive Thru
Victoria Park
South Ruislip

Project Number:
A095837

Drawing Title / Scenario:
Combined Worst Case
LAeq 1-hour Source
Noise Levels

Drawing Number:
SK03

Key:
Site Boundary: —

Scale : Not to scale

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Appendix C – Model Input Calculations

This appendix shows the detailed calculations for the noise levels presented in Table 3.2 within the noise technical report.

Drive-thru and Customer Noise:

Customer Car Pulling Off L_{Aeq} , Noise Levels (at source)

$$\begin{aligned} L_{Aeq, 1hr} &= 66.4 \text{ dB } L_{Aeq} \text{ at 2 m distance (vehicle pulling off)} \\ L_{Aeq, 1hr} &= 136 \times 3 \text{ seconds (408 secs) at } L_p 66.4 \text{ dB at 2 m distance} \\ \text{Daytime } L_{Aeq, 1hr} &= 10\log(1/3600)(408\text{secs} \times 10^{0.1 \times 66.4\text{dB}}) \\ \text{Daytime } L_{Aeq, 1hr} &= \mathbf{56.9 \text{ dB at 2 m distance (modelled as a point source)}} \end{aligned}$$

$$\begin{aligned} L_{Aeq, 1hr} &= 66.4 \text{ dB } L_{Aeq} \text{ at 2 m distance (vehicle pulling off)} \\ L_{Aeq, 1hr} &= 36 \times 3 \text{ seconds (108 secs) at } L_p 66.4 \text{ dB at 2 m distance} \\ \text{Night-time } L_{Aeq, 1hr} &= 10\log(1/3600)(108\text{secs} \times 10^{0.1 \times 66.4\text{dB}}) \\ \text{Night-time } L_{Aeq, 1hr} &= \mathbf{51.2 \text{ dB at 2 m distance (modelled as a point source)}} \end{aligned}$$

Customer Car Idling L_{Aeq} , Noise Levels (at source)

$$\begin{aligned} L_{Aeq, 1hr} &= 60.9 \text{ dB } L_{Aeq} \text{ at 2 m distance (vehicle idling)} \\ L_{Aeq, 1hr} &= 18 \times 300 \text{ seconds (5400 secs) at } L_p 60.9 \text{ dB at 2 m distance} \\ \text{Daytime } L_{Aeq, 1hr} &= 10\log(1/3600)(5400\text{secs} \times 10^{0.1 \times 60.9\text{dB}}) \\ \text{Daytime } L_{Aeq, 1hr} &= \mathbf{62.7 \text{ dB at 2 m distance (modelled as a line source)}} \end{aligned}$$

$$\begin{aligned} L_{Aeq, 1hr} &= 60.9 \text{ dB } L_{Aeq} \text{ at 2 m distance (vehicle idling)} \\ L_{Aeq, 1hr} &= 9 \times 300 \text{ seconds (2700 secs) at } L_p 60.9 \text{ dB at 2 m distance} \\ \text{Night-time } L_{Aeq, 1hr} &= 10\log(1/3600)(2700\text{secs} \times 10^{0.1 \times 60.9\text{dB}}) \\ \text{Night-time } L_{Aeq, 1hr} &= \mathbf{59.7 \text{ dB at 2 m distance (modelled as a line source)}} \end{aligned}$$

Intercom Conversation

$L_{Aeq, 1hr}$ = 136 x 30 seconds (4080 secs) at L_p 78.4 dB at 0.5 m distance (intercom)

Daytime $L_{Aeq, 1hr}$ = $10\log(1/3600)(4080secs \times 10^{0.1 \times 78.4dB})$

Daytime $L_{Aeq, 1hr}$ = 78.9 dB at 0.5 m distance (modelled as a point source)

$L_{Aeq, 1hr}$ = 36 x 30 seconds (2370 secs) at L_p 78.4 dB at 0.5 m distance (intercom)

Night-time $L_{Aeq, 1 hr}$ = $10\log(1/3600)(1080secs \times 10^{0.1 \times 78.4dB})$

Night-time $L_{Aeq, 1 hr}$ = 73.2 dB at 0.5 m distance (modelled as a point source)

Customer Pedestrian Movements

300 x 5 seconds (1500 secs) at L_p 42.0 dB at 3 m distance (pedestrian pass-by)

Daytime $L_{Aeq, 1hr}$ = $10\log(1/3600)(1500secs \times 10^{0.1 \times 42.0dB})$

Daytime $L_{Aeq, 1hr}$ = 38.2 dB at 3 m distance (modelled as an area source)

300 x 5 seconds (1500 secs) at L_p 42.0 dB at 3 m distance (pedestrian pass-by)

Night-time $L_{Aeq, 1hr}$ = $10\log(1/900)(1500secs \times 10^{0.1 \times 42.0dB})$

Night-time $L_{Aeq, 1hr}$ = 38.2 dB at 3 m distance (modelled as an area source)

Delivery Event Noise Data:

Roll Cage Movement

40 minutes at L_p 64.0 dB at 3 m distance (unloading roll cages from vehicle)

$L_{Aeq, 1hr}$ = $10\log(1/3600)(2400 \times 10^{0.1 \times 64.0})$

Daytime $L_{Aeq, 1hr}$ = 62.2 dB at 3 m distance (Modelled as Line and Point Source)

$L_{Aeq, 15 min}$ = $10\log(1/900)(840 \times 10^{0.1 \times 64.0})$

Night-time $L_{Aeq, 15min}$ = 63.7 dB at 3 m distance (Modelled as Line and Point Source)



Appendix D – Drive-thru Assessment Tables

Table D1 Change in Noise Level Drive-Thru Assessment (Monday-Friday)

Time Period	Existing Ambient Noise Level L _{Aeq} (dB)									Existing Ambient Noise Levels + Drive-Thru Noise L _{Aeq} (dB)									Contribution from Proposed Drive-thru L _{Aeq} (dB)												
	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	
00:00-01:00	53.3	53.3	53.3	53.3	53.3	53.3	53.3	n/a			53.8	53.5	54.1	53.8	53.4	53.4	53.4	n/a			0.5	0.2	0.8	0.5	0.1	0.1	0.1	n/a			
01:00-02:00	49.2	49.2	49.2	49.2	49.2	49.2	49.2				50.3	49.7	51.0	50.5	49.5	49.5	49.4				1.1	0.5	1.8	1.3	0.3	0.3	0.2				
02:00-03:00	49.4	49.4	49.4	49.4	49.4	49.4	49.4				50.4	49.9	51.2	50.6	49.7	49.7	49.6				1.0	0.5	1.8	1.2	0.3	0.3	0.2				
03:00-04:00	50.6	50.6	50.6	50.6	50.6	50.6	50.6				51.4	50.9	52.0	51.6	50.8	50.8	50.8				0.8	0.3	1.4	1.0	0.2	0.2	0.2				
04:00-05:00	52.8	52.8	52.8	52.8	52.8	52.8	52.8				53.3	53.0	53.7	53.4	53.0	52.9	52.9				0.5	0.2	0.9	0.6	0.2	0.1	0.1				
05:00-06:00	55.7	55.7	55.7	55.7	55.7	55.7	55.7				56.0	55.8	56.2	56.0	55.8	55.8	55.7				0.3	0.1	0.5	0.3	0.1	0.1	0.0				
06:00-07:00	58.8	58.8	58.8	58.8	58.8	58.8	58.8				58.9	58.9	59.0	59.0	58.8	58.8	58.8				0.1	0.1	0.2	0.2	0.0	0.0	0.0				
07:00-08:00	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	59.9	60.1	60.0	60.3	60.2	60.0	60.0	60.0	60.0	60.0	60.1	0.2	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
08:00-09:00	59.2	59.2	59.2	59.2	59.2	59.2	59.2	59.2	59.2	59.2	59.5	59.3	59.7	59.5	59.3	59.3	59.3	59.3	59.3	59.4	0.3	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
09:00-10:00	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.5	60.7	60.6	60.8	60.7	60.6	60.6	60.5	60.6	60.6	60.6	0.2	0.1	0.3	0.2	0.1	0.1	0.0	0.1	0.1	0.1	0.1
10:00-11:00	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.1	60.3	60.2	60.5	60.4	60.2	60.2	60.2	60.2	60.2	60.3	0.2	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
11:00-12:00	59.7	59.7	59.7	59.7	59.7	59.7	59.7	59.7	59.7	59.7	59.9	59.8	60.1	60.0	59.8	59.8	59.8	59.8	59.8	59.9	0.2	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
12:00-13:00	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.0	60.2	60.1	60.4	60.3	60.1	60.1	60.1	60.1	60.1	60.2	0.2	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
13:00-14:00	59.6	59.6	59.6	59.6	59.6	59.6	59.6	59.6	59.6	59.6	59.8	59.7	60.0	59.9	59.7	59.7	59.7	59.7	59.7	59.8	0.2	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
14:00-15:00	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.5	59.4	59.7	59.6	59.4	59.4	59.4	59.4	59.4	59.5	0.2	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
15:00-16:00	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	58.8	59.1	58.9	59.3	59.1	58.9	58.9	58.9	58.9	58.9	59.0	0.3	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
16:00-17:00	59.2	59.2	59.2	59.2	59.2	59.2	59.2	59.2	59.2	59.2	59.5	59.3	59.7	59.5	59.3	59.3	59.3	59.3	59.3	59.4	0.3	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
17:00-18:00	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	59.2	59.0	59.4	59.2	59.0	59.0	59.0	59.0	59.0	59.1	0.3	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
18:00-19:00	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.6	58.4	58.8	58.7	58.4	58.4	58.4	58.4	58.4	58.5	0.3	0.1	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.2
19:00-20:00	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.1	59.4	59.2	59.6	59.4	59.2	59.2	59.2	59.2	59.2	59.3	0.3	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.2
20:00-21:00	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.8	58.6	59.0	58.9	58.6	58.6	58.6	58.6	58.6	58.7	0.3	0.1	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.1	0.2
21:00-22:00	57.4	57.4	57.4	57.4	57.4	57.4	57.4	57.4	57.4	57.4	57.8	57.6	58.1	57.9	57.5	57.5	57.5	57.5	57.5	57.7	0.4	0.2	0.7	0.5	0.1	0.1	0.1	0.1	0.1	0.1	0.3
22:00-23:00	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.1	57.5	57.3	57.8	57.6	57.2	57.2	57.2	57.3	57.2	57.4	0.4	0.2	0.7	0.5	0.1	0.1	0.1	0.2	0.1	0.1	0.3
23:00-00:00	53.7	53.7	53.7	53.7	53.7	53.7	53.7	n/a			54.1	53.9	54.4	54.2	53.8	53.8	53.8	n/a			0.4	0.2	0.7	0.5	0.1	0.1	0.1	n/a			

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

**Table D2 Change in Noise Level Drive-Thru Assessment (Saturday)**

Time Period	Existing Ambient Noise Level L _{Aeq} (dB)									Existing Ambient Noise Levels + Drive-Thru Noise L _{Aeq} (dB)									Contribution from Proposed Drive-thru L _{Aeq} (dB)												
	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	
00:00-01:00	50.7	50.7	50.7	50.7	50.7	50.7	50.7	n/a			51.5	51.0	52.1	51.7	50.9	50.9	50.9	n/a			0.8	0.3	1.4	1.0	0.2	0.2	0.2	n/a			
01:00-02:00	49.8	49.8	49.8	49.8	49.8	49.8	49.8				50.8	50.2	51.4	50.9	50.1	50.1	50.0				1.0	0.4	1.6	1.1	0.3	0.3	0.2				
02:00-03:00	54.7	54.7	54.7	54.7	54.7	54.7	54.7				55.0	54.8	55.3	55.1	54.8	54.8	54.8				0.3	0.1	0.6	0.4	0.1	0.1	0.1				
03:00-04:00	50.7	50.7	50.7	50.7	50.7	50.7	50.7				51.5	51.0	52.1	51.7	50.9	50.9	50.9				0.8	0.3	1.4	1.0	0.2	0.2	0.2				
04:00-05:00	51.9	51.9	51.9	51.9	51.9	51.9	51.9				52.5	52.2	53.0	52.6	52.1	52.1	52.0				0.6	0.3	1.1	0.7	0.2	0.2	0.1				
05:00-06:00	54.1	54.1	54.1	54.1	54.1	54.1	54.1				54.5	54.3	54.8	54.6	54.2	54.2	54.2				0.4	0.2	0.7	0.5	0.1	0.1	0.1				
06:00-07:00	57.0	57.0	57.0	57.0	57.0	57.0	57.0				57.2	57.1	57.4	57.2	57.1	57.0	57.0				0.2	0.1	0.4	0.2	0.1	0.0	0.0				
07:00-08:00	56.7	56.7	56.7	56.7	56.7	56.7	56.7	56.7	56.7	56.7	57.1	56.9	57.5	57.2	56.9	56.8	56.8	56.9	56.9	57.0	0.4	0.2	0.8	0.5	0.2	0.1	0.1	0.2	0.2	0.3	
08:00-09:00	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.5	58.8	58.6	59.0	58.9	58.6	58.6	58.6	58.6	58.6	58.7	0.3	0.1	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.2	
09:00-10:00	59.8	59.8	59.8	59.8	59.8	59.8	59.8	59.8	59.8	59.8	60.0	59.9	60.2	60.1	59.9	59.9	59.9	59.9	59.9	60.0	0.2	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.2	
10:00-11:00	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	59.2	59.0	59.4	59.2	59.0	59.0	59.0	59.0	59.0	59.1	0.3	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.2	
11:00-12:00	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	58.7	59.0	58.8	59.2	59.0	58.8	58.8	58.8	58.8	58.8	58.9	0.3	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.2	
12:00-13:00	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.1	58.4	58.2	58.7	58.5	58.2	58.2	58.2	58.2	58.2	58.3	0.3	0.1	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.2	
13:00-14:00	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	57.6	58.0	57.8	58.2	58.0	57.7	57.7	57.7	57.7	57.7	57.9	0.4	0.2	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.3	
14:00-15:00	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.6	58.9	58.7	59.1	59.0	58.7	58.7	58.7	58.7	58.7	58.8	0.3	0.1	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.2	
15:00-16:00	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	58.1	57.9	58.3	58.1	57.8	57.8	57.8	57.8	57.8	58.0	0.4	0.2	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.3	
16:00-17:00	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.5	58.3	58.8	58.6	58.3	58.3	58.3	58.3	58.3	58.4	0.3	0.1	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.2	
17:00-18:00	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	59.2	59.0	59.4	59.2	59.0	59.0	59.0	59.0	59.0	59.1	0.3	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.2	
18:00-19:00	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.3	58.6	58.4	58.8	58.7	58.4	58.4	58.4	58.4	58.4	58.5	0.3	0.1	0.5	0.4	0.1	0.1	0.1	0.1	0.1	0.2	
19:00-20:00	57.4	57.4	57.4	57.4	57.4	57.4	57.4	57.4	57.4	57.4	57.8	57.6	58.1	57.9	57.5	57.5	57.5	57.5	57.5	57.7	0.4	0.2	0.7	0.5	0.1	0.1	0.1	0.1	0.1	0.3	
20:00-21:00	56.6	56.6	56.6	56.6	56.6	56.6	56.6	56.6	56.6	56.6	57.1	56.8	57.4	57.1	56.8	56.8	56.7	56.8	56.8	56.9	0.5	0.2	0.8	0.5	0.2	0.2	0.1	0.2	0.2	0.3	
21:00-22:00	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	55.6	56.2	55.9	56.6	56.3	55.8	55.8	55.7	55.8	55.8	56.0	0.6	0.3	1.0	0.7	0.2	0.2	0.1	0.2	0.2	0.4	
22:00-23:00	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	55.5	56.1	55.8	56.5	56.2	55.7	55.7	55.6	55.7	55.7	55.9	0.6	0.3	1.0	0.7	0.2	0.2	0.1	0.2	0.2	0.4	
23:00-00:00	54.2	54.2	54.2	54.2	54.2	54.2	54.2	n/a			54.6	54.4	54.9	54.7	54.3	54.3	54.3	n/a			0.4	0.2	0.7	0.5	0.1	0.1	0.1	n/a			

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

**Table D3 Change in Noise Level Drive-Thru Assessment (Sunday)**

Time Period	Existing Ambient Noise Level L _{Aeq} (dB)									Existing Ambient Noise Levels + Drive-Thru Noise L _{Aeq} (dB)									Contribution from Proposed Drive-thru L _{Aeq} (dB)												
	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	
00:00-01:00	52.3	52.3	52.3	52.3	52.3	52.3	52.3	n/a			52.9	52.5	53.3	53.0	52.5	52.4	52.4	n/a			0.6	0.2	1.0	0.7	0.2	0.1	0.1	n/a			
01:00-02:00	56.8	56.8	56.8	56.8	56.8	56.8	56.8				57.0	56.9	57.2	57.1	56.9	56.9	56.8				0.2	0.1	0.4	0.3	0.1	0.1	0.0				
02:00-03:00	50.2	50.2	50.2	50.2	50.2	50.2	50.2				51.1	50.6	51.7	51.3	50.5	50.4	50.4				0.9	0.4	1.5	1.1	0.3	0.2	0.2				
03:00-04:00	49.6	49.6	49.6	49.6	49.6	49.6	49.6				50.6	50.0	51.3	50.8	49.9	49.9	49.8				1.0	0.4	1.7	1.2	0.3	0.3	0.2				
04:00-05:00	50.4	50.4	50.4	50.4	50.4	50.4	50.4				51.2	50.8	51.9	51.4	50.7	50.6	50.6				0.8	0.4	1.5	1.0	0.3	0.2	0.2				
05:00-06:00	50.9	50.9	50.9	50.9	50.9	50.9	50.9				51.7	51.2	52.2	51.8	51.1	51.1	51.0				0.8	0.3	1.3	0.9	0.2	0.2	0.1				
06:00-07:00	52.8	52.8	52.8	52.8	52.8	52.8	52.8				53.3	53.0	53.7	53.4	53.0	52.9	52.9				0.5	0.2	0.9	0.6	0.2	0.1	0.1				
07:00-08:00	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	53.1	54.1	53.6	54.7	54.2	53.5	53.4	53.3	53.5	53.5	53.8	1.0	0.5	1.6	1.1	0.4	0.3	0.2	0.4	0.4	0.7	
08:00-09:00	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	54.4	55.1	54.7	55.6	55.3	54.7	54.6	54.6	54.7	54.7	55.0	0.7	0.3	1.2	0.9	0.3	0.2	0.2	0.3	0.3	0.6	
09:00-10:00	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.3	59.5	59.4	59.7	59.6	59.4	59.4	59.4	59.4	59.4	59.5	0.2	0.1	0.4	0.3	0.1	0.1	0.1	0.1	0.1	0.2	
10:00-11:00	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	58.1	57.9	58.3	58.1	57.8	57.8	57.8	57.8	57.8	58.0	0.4	0.2	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.3	
11:00-12:00	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.2	58.5	58.3	58.8	58.6	58.3	58.3	58.3	58.3	58.3	58.4	0.3	0.1	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.2	
12:00-13:00	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	58.1	57.9	58.3	58.1	57.8	57.8	57.8	57.8	57.8	58.0	0.4	0.2	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.3	
13:00-14:00	56.4	56.4	56.4	56.4	56.4	56.4	56.4	56.4	56.4	56.4	56.9	56.6	57.2	57.0	56.6	56.6	56.5	56.6	56.6	56.8	0.5	0.2	0.8	0.6	0.2	0.2	0.1	0.2	0.2	0.4	
14:00-15:00	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	58.1	57.9	58.3	58.1	57.8	57.8	57.8	57.8	57.8	58.0	0.4	0.2	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.3	
15:00-16:00	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	57.7	58.1	57.9	58.3	58.1	57.8	57.8	57.8	57.8	57.8	58.0	0.4	0.2	0.6	0.4	0.1	0.1	0.1	0.1	0.1	0.3	
16:00-17:00	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	58.9	59.2	59.0	59.4	59.2	59.0	59.0	59.0	59.0	59.0	59.1	0.3	0.1	0.5	0.3	0.1	0.1	0.1	0.1	0.1	0.2	
17:00-18:00	57.5	57.5	57.5	57.5	57.5	57.5	57.5	57.5	57.5	57.5	57.9	57.7	58.2	58.0	57.6	57.6	57.6	57.6	57.6	57.8	0.4	0.2	0.7	0.5	0.1	0.1	0.1	0.1	0.1	0.3	
18:00-19:00	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	56.8	57.2	57.0	57.6	57.3	57.0	56.9	56.9	57.0	57.0	57.1	0.4	0.2	0.8	0.5	0.2	0.1	0.1	0.2	0.2	0.3	
19:00-20:00	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	56.5	57.0	56.7	57.3	57.1	56.7	56.7	56.6	56.7	56.7	56.9	0.5	0.2	0.8	0.6	0.2	0.2	0.1	0.2	0.2	0.4	
20:00-21:00	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.1	56.6	56.3	57.0	56.7	56.3	56.3	56.2	56.3	56.3	56.5	0.5	0.2	0.9	0.6	0.2	0.2	0.1	0.2	0.2	0.4	
21:00-22:00	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	55.4	56.0	55.7	56.4	56.1	55.6	55.6	55.5	55.6	55.6	55.9	0.6	0.3	1.0	0.7	0.2	0.2	0.1	0.2	0.2	0.5	
22:00-23:00	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.0	54.8	54.4	55.3	55.0	54.3	54.3	54.2	54.3	54.3	54.6	0.8	0.4	1.3	1.0	0.3	0.3	0.2	0.3	0.3	0.6	
23:00-00:00	54.5	54.5	54.5	54.5	54.5	54.5	54.5	n/a			54.8	54.6	55.1	54.9	54.6	54.6	54.6	n/a			0.3	0.1	0.6	0.4	0.1	0.1	0.1	n/a			

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



Appendix E – BS 4142 Delivery Assessment Tables

Table E1 Background Comparison Delivery Assessment (Monday-Friday)

Time Period	Measured Background L _{A90} (dB)										Noise Rating Level (dB)										Difference between background and rating noise level (dB)											
	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3		
00:00-01:00	43	43	43	43	43	43	43	n/a			40	33	34	28	24	23	23	n/a			-3	-10	-9	-15	-19	-20	-20	n/a				
01:00-02:00	40	40	40	40	40	40	40				40	40	33	34	28	24	23				23	0	-7	-6	-12	-16	-17				-17	
02:00-03:00	40	40	40	40	40	40	40				40	40	33	34	28	24	23				23	0	-7	-6	-12	-16	-17				-17	
03:00-04:00	44	44	44	44	44	44	44				44	44	33	34	28	24	23				23	-4	-11	-10	-16	-20	-21				-21	
04:00-05:00	47	47	47	47	47	47	47				47	47	33	34	28	24	23				23	-7	-14	-13	-19	-23	-24				-24	
05:00-06:00	52	52	52	52	52	52	52				52	52	33	34	28	24	23				23	-11	-18	-18	-23	-27	-28				-28	
06:00-07:00	56	56	56	56	56	56	56				56	56	33	34	28	24	23				23	-16	-23	-22	-28	-32	-33				-33	
07:00-08:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-19	-25	-25	-31	-34	-35	-35	-22	-22	-20		
08:00-09:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-30	-33	-34	-34	-21	-22	-19		
09:00-10:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-31	-34	-35	-35	-22	-22	-20		
10:00-11:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-31	-34	-35	-35	-22	-22	-19		
11:00-12:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-30	-34	-35	-34	-22	-22	-19		
12:00-13:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-30	-34	-35	-34	-22	-22	-19		
13:00-14:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-30	-34	-34	-34	-22	-22	-19		
14:00-15:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-30	-34	-35	-34	-22	-22	-19		
15:00-16:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-24	-30	-33	-34	-34	-21	-21	-19		
16:00-17:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-30	-34	-35	-34	-22	-22	-19		
17:00-18:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-30	-34	-34	-34	-22	-22	-19		
18:00-19:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-30	-33	-34	-34	-21	-22	-19		
19:00-20:00	57	57	57	57	57	57	57	57	57	57	39	32	32	27	23	22	23	35	35	38	-18	-25	-25	-30	-34	-34	-34	-22	-22	-19		
20:00-21:00	56	56	56	56	56	56	56	56	56	56	39	32	32	27	23	22	23	35	35	38	-17	-24	-24	-29	-32	-33	-33	-20	-21	-18		
21:00-22:00	55	55	55	55	55	55	55	55	55	55	39	32	32	27	23	22	23	35	35	38	-16	-23	-23	-28	-32	-32	-32	-20	-20	-17		
22:00-23:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-21	-26	-30	-31	-30	-18	-18	-15		
23:00-00:00	50	50	50	50	50	50	50	n/a			40	33	34	28	24	23	23	n/a			-9	-16	-16	-21	-25	-26	-26	n/a				

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

**Table E2 Background Comparison Delivery Assessment (Saturday)**

Time Period	Measured Background L _{A90} (dB)										Noise Rating Level (dB)									Difference between background and specific noise level (dB)											
	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	
00:00-01:00	43	43	43	43	43	43	43	n/a			40	33	34	28	24	23	23	n/a			-2	-9	-9	-14	-18	-19	-19	n/a			
01:00-02:00	41	41	41	41	41	41	41				40	33	34	28	24	23	23				-1	-7	-7	-13	-17	-18	-18				
02:00-03:00	39	39	39	39	39	39	39				40	33	34	28	24	23	23				1	-6	-5	-11	-15	-16	-16				
03:00-04:00	42	42	42	42	42	42	42				40	33	34	28	24	23	23				-2	-9	-8	-14	-18	-19	-19				
04:00-05:00	45	45	45	45	45	45	45				40	33	34	28	24	23	23				-5	-12	-11	-17	-21	-22	-22				
05:00-06:00	47	47	47	47	47	47	47				40	33	34	28	24	23	23				-7	-13	-13	-19	-23	-24	-24				
06:00-07:00	49	49	49	49	49	49	49				40	33	34	28	24	23	23				-9	-15	-15	-21	-25	-26	-26				
07:00-08:00	51	51	51	51	51	51	51	51	51	51	39	32	32	27	23	22	23	35	35	38	-12	-19	-19	-24	-28	-28	-28	-16	-16	-13	
08:00-09:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-21	-27	-30	-31	-31	-18	-18	-16	
09:00-10:00	54	54	54	54	54	54	54	54	54	54	39	32	32	27	23	22	23	35	35	38	-15	-22	-22	-28	-31	-32	-32	-19	-19	-17	
10:00-11:00	54	54	54	54	54	54	54	54	54	54	39	32	32	27	23	22	23	35	35	38	-15	-22	-22	-28	-31	-32	-32	-19	-19	-17	
11:00-12:00	54	54	54	54	54	54	54	54	54	54	39	32	32	27	23	22	23	35	35	38	-15	-22	-22	-27	-30	-31	-31	-19	-19	-16	
12:00-13:00	52	52	52	52	52	52	52	52	52	52	39	32	32	27	23	22	23	35	35	38	-14	-21	-20	-26	-29	-30	-30	-17	-17	-15	
13:00-14:00	52	52	52	52	52	52	52	52	52	52	39	32	32	27	23	22	23	35	35	38	-13	-20	-20	-26	-29	-30	-30	-17	-17	-14	
14:00-15:00	52	52	52	52	52	52	52	52	52	52	39	32	32	27	23	22	23	35	35	38	-14	-21	-20	-26	-29	-30	-30	-17	-17	-15	
15:00-16:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-21	-26	-29	-30	-30	-18	-18	-15	
16:00-17:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-21	-26	-30	-31	-30	-18	-18	-15	
17:00-18:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-21	-27	-30	-31	-31	-18	-18	-16	
18:00-19:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-21	-27	-30	-31	-31	-18	-18	-15	
19:00-20:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-20	-26	-29	-30	-30	-17	-17	-15	
20:00-21:00	52	52	52	52	52	52	52	52	52	52	39	32	32	27	23	22	23	35	35	38	-13	-20	-20	-25	-28	-29	-29	-16	-17	-14	
21:00-22:00	51	51	51	51	51	51	51	51	51	51	39	32	32	27	23	22	23	35	35	38	-12	-19	-19	-24	-27	-28	-28	-15	-16	-13	
22:00-23:00	50	50	50	50	50	50	50	50	50	50	39	32	32	27	23	22	23	35	35	38	-11	-18	-18	-23	-27	-28	-27	-15	-15	-12	
23:00-00:00	48	48	48	48	48	48	48	n/a			40	33	34	28	24	23	23	n/a			-7	-14	-14	-19	-23	-25	-25	n/a			

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

**Table E3 Background Comparison Delivery Assessment (Sunday)**

Time Period	Measured Background L _{A90} (dB)										Noise Rating Level (dB)									Difference between background and specific noise level (dB)											
	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	R1	R2	R3	R4	R5	R6	R7	S1	S2	S3	
00:00-01:00	45	45	45	45	45	45	45	n/a			40	33	34	28	24	23	23	n/a			-5	-12	-11	-17	-21	-22	-22	n/a			
01:00-02:00	43	43	43	43	43	43	43				40	33	34	28	24	23	23				-2	-9	-9	-14	-18	-19	-19				
02:00-03:00	40	40	40	40	40	40	40				40	33	34	28	24	23	23				0	-6	-6	-12	-16	-17	-17				
03:00-04:00	41	41	41	41	41	41	41				40	33	34	28	24	23	23				-1	-8	-7	-13	-17	-18	-18				
04:00-05:00	43	43	43	43	43	43	43				40	33	34	28	24	23	23				-3	-10	-9	-15	-19	-20	-20				
05:00-06:00	43	43	43	43	43	43	43				40	33	34	28	24	23	23				-3	-10	-9	-15	-19	-20	-20				
06:00-07:00	44	44	44	44	44	44	44				40	33	34	28	24	23	23				-4	-11	-10	-16	-20	-21	-21				
07:00-08:00	46	46	46	46	46	46	46	46	46	46	39	32	32	27	23	22	23	35	35	38	-7	-14	-14	-20	-23	-24	-24	-11	-11	-8	
08:00-09:00	48	48	48	48	48	48	48	48	48	48	39	32	32	27	23	22	23	35	35	38	-9	-16	-16	-21	-25	-25	-25	-13	-13	-10	
09:00-10:00	51	51	51	51	51	51	51	51	51	51	39	32	32	27	23	22	23	35	35	38	-13	-20	-19	-25	-28	-29	-29	-16	-16	-14	
10:00-11:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-21	-27	-30	-31	-31	-18	-18	-15	
11:00-12:00	52	52	52	52	52	52	52	52	52	52	39	32	32	27	23	22	23	35	35	38	-14	-21	-20	-26	-29	-30	-30	-17	-17	-15	
12:00-13:00	52	52	52	52	52	52	52	52	52	52	39	32	32	27	23	22	23	35	35	38	-14	-20	-20	-26	-29	-30	-30	-17	-17	-15	
13:00-14:00	51	51	51	51	51	51	51	51	51	51	39	32	32	27	23	22	23	35	35	38	-13	-20	-19	-25	-28	-29	-29	-16	-16	-14	
14:00-15:00	52	52	52	52	52	52	52	52	52	52	39	32	32	27	23	22	23	35	35	38	-14	-20	-20	-26	-29	-30	-30	-17	-17	-15	
15:00-16:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-21	-26	-29	-30	-30	-17	-18	-15	
16:00-17:00	53	53	53	53	53	53	53	53	53	53	39	32	32	27	23	22	23	35	35	38	-14	-21	-21	-26	-29	-30	-30	-18	-18	-15	
17:00-18:00	52	52	52	52	52	52	52	52	52	52	39	32	32	27	23	22	23	35	35	38	-13	-20	-20	-26	-29	-30	-30	-17	-17	-15	
18:00-19:00	51	51	51	51	51	51	51	51	51	51	39	32	32	27	23	22	23	35	35	38	-13	-19	-19	-25	-28	-29	-29	-16	-16	-14	
19:00-20:00	51	51	51	51	51	51	51	51	51	51	39	32	32	27	23	22	23	35	35	38	-13	-20	-19	-25	-28	-29	-29	-16	-16	-14	
20:00-21:00	51	51	51	51	51	51	51	51	51	51	39	32	32	27	23	22	23	35	35	38	-12	-19	-19	-24	-27	-28	-28	-15	-16	-13	
21:00-22:00	49	49	49	49	49	49	49	49	49	49	39	32	32	27	23	22	23	35	35	38	-10	-17	-17	-22	-25	-26	-26	-14	-14	-11	
22:00-23:00	47	47	47	47	47	47	47	47	47	47	39	32	32	27	23	22	23	35	35	38	-9	-15	-15	-21	-24	-25	-25	-12	-12	-10	
23:00-00:00	44	44	44	44	44	44	44	n/a			40	33	34	28	24	23	23	n/a			-3	-10	-10	-15	-19	-20	-20	n/a			

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

Appendix F – Report Conditions

This Report has been prepared using reasonable skill and care for the sole benefit of Scottish Widows Property Authorised Contractual Scheme 1 ("the Client") for the proposed uses stated in the report by [WYG Environment Planning Transport Limited] ("WYG"). WYG exclude all liability for any other uses and to any other party. The report must not be relied on or reproduced in whole or in part by any other party without the copyright holder's permission.

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The report refers, within the limitations stated, to the environment of the site in the context of the surrounding area at the time of the inspections'. Environmental conditions can vary and no warranty is given as to the possibility of changes in the environment of the site and surrounding area at differing times. No investigative method can eliminate the possibility of obtaining partially imprecise, incomplete or not fully representative information. Any monitoring or survey work undertaken as part of the commission will have been subject to limitations, including for example timescale, seasonal and weather-related conditions. Actual environmental conditions are typically more complex and variable than the investigative, predictive and modelling approaches indicate in practice, and the output of such approaches cannot be relied upon as a comprehensive or accurate indicator of future conditions. The "shelf life" of the Report will be determined by a number of factors including; its original purpose, the Client's instructions, passage of time, advances in technology and techniques, changes in legislation etc. and therefore may require future re-assessment.

The whole of the report must be read as other sections of the report may contain information which puts into context the findings in any executive summary.

The performance of environmental protection measures and of buildings and other structures in relation to acoustics, vibration, noise mitigation and other environmental issues is influenced to a large extent by the degree to which the relevant environmental considerations are incorporated into the final design and specifications and the quality of workmanship and compliance with the specifications on site during construction. WYG accept no liability for issues with performance arising from such factors.