



Ocado CFC Unit B
Symmetry Park, Bicester
Noise Impact Assessment

For Tritax Symmetry Bicester 2 Ltd

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CONTENTS

1.	INTRODUCTION.....	1
2.	PLANNING POLICY.....	2
2.1	National Planning Policy Framework	2
2.2	Planning Practice Guidance	2
2.3	Local Policy.....	5
3.	GUIDANCE DOCUMENTS	6
3.1	British Standard 4142:2014+A1:2019.....	6
4.	PLANT NOISE PLANNING CONDITION	7
5.	PROPOSED DEVELOPMENT	8
5.1	Trip Generation.....	10
6.	BASELINE CONDITIONS	11
6.1	Survey Methodology.....	11
6.2	Survey Results	12
7.	ASSESSMENT OF OPERATION NOISE LEVELS.....	14
7.1	Prediction of Specific Sound Level from Delivery and Collections	14
7.2	BS4142:2014 Assessment – Delivery and Collections.....	16
7.3	Prediction of Specific Sound Level from Vehicle Maintenance Unit (VMU).....	18
7.4	Noise from Vehicle Washing.....	20
8.	TRAFFIC NOISE ASSESSMENT	21
9.	SUMMARY.....	22

Tables

Table 1:	PPG Noise Guidance.....	4
Table 2:	Unit B Ocado Derived & Net Trip Generation (B8 Use Class)	10
Table 3:	Survey Equipment	12
Table 4:	Typical Background Sound Levels.....	13
Table 5:	Measured Noise Levels from Fork Lift Activity	14
Table 6:	Measured Noise Levels from Lorries Manoeuvring.....	14
Table 7:	Estimated Specific Noise Levels at Wretchwick Cottage	15
Table 8:	Estimated Specific Noise Levels at Little Wretchwick Farm.....	15
Table 9:	BS4142:2014 Assessment – Deliveries and Collections at Night - Wretchwick Cottage.....	16
Table 10:	BS4142:2014 Assessment – Deliveries and Collections at Night – Little Wretchwick Farm	17
Table 11:	VMU BS4142:2014 Assessment (Night) - Wretchwick Cottage	19
Table 12:	VMU BS4142:2014 Assessment (Night)- Little Wretchwick Farm	19
Table 13:	Noise Limits at Receptors for Vehicle Washing	20

Table 14: Flow rate change at junctions from Transport Assessment and Corresponding Noise Impact21

Figures

Figure 1: Symmetry Park showing Unit B and accesses8
Figure 2: Proposed revised Unit B site layout9
Figure 3: Aerial photograph of site showing background sound measurement location and receptors11
Figure 4 Environmental noise survey results13

1. INTRODUCTION

Hydrock Acoustics is appointed by Tritax Symmetry to prepare a Noise Impact Assessment for proposed changes to the consented warehouse at Unit B Symmetry Park, Bicester.

The planning history of the Symmetry Park site and Unit B includes a hybrid planning permission granted in November 2016 (Planning ref: 16/00861/HYBRID) comprising:

- Full planning permission for 18,394 m² of logistics floor space, within class B8, with ancillary class B1 (A) offices, together with access from A41 Aylesbury Road, associated site infrastructure including lorry parking, landscaping, amenity open space and sustainable drainage and private sewage treatment plant, allocated as Zone 1; and
- Outline planning permission for up to 44,314 m² of logistics floor space, within class B8, with ancillary class B1 (A) offices, together with associated site infrastructure including lorry parking, landscaping, amenity open space, sustainable drainage and private sewage treatment plant, allocated as Zone 2.

Full planning permission (Planning ref: 18/00091/F) was later sought for Unit B (Class B8) for a warehouse of 14,200m², ancillary class B1(a) offices of 929m², and 26m² gatehouse totalling 15,155m². The proposals additionally included the erection of a security fence, sprinkler tank and pump house, with an access road and associated site infrastructure including: external service yard, lorry parking, landscaping, amenity open space including 10m green corridor with 3m foot path and cycle link to wider Bicester 12, storm water drainage infrastructure, and private sewage treatment plant. Unit B has now been fully built out.

Full planning permission has also been granted for 'Unit C' to include 29,350 sqm of logistics floor space and an additional 4,635m² of logistics floor space to accommodate a parcel distribution depot to be operated by the DPD Group Ltd.

This report provides a noise assessment of revised proposals for Unit B. The already constructed Unit B's GFA is to remain unchanged. The application proposes amendments to the service yard layout and parking for: different vehicle types that are associated with Ocado's Customer Fulfilment Centres (CFCs), the addition of a Vehicle Maintenance Unit (VMU), and a Vehicle Washing Facility. Details of the development proposals are outlined in Section 5.

2. PLANNING POLICY

2.1 National Planning Policy Framework

The 'National Planning Policy Framework' (NPPF), February 2019, Ministry of Housing, Communities and Local Government, sets out the United Kingdom Government's planning policies for adoption in England and how they should be applied.

The main aims of the NPPF are set out in section 11, as stated below.

'Planning policies and decisions should:

- Encourage multiple benefits from both urban and rural land, including through mixed use schemes and taking opportunities to achieve net environmental gains – such as developments that would enable new habitat creation or improve public access to the countryside;
- Recognise that some undeveloped land can perform many functions, such as for wildlife, recreation, flood risk mitigation, cooling/shading, carbon storage or food production;
- Give substantial weight to the value of using suitable brownfield land within settlements for homes and other identified needs, and support appropriate opportunities to remediate despoiled, degraded, derelict, contaminated or unstable land;
- Promote and support the development of under-utilised land and buildings, especially if this would help to meet identified needs for housing where land supply is constrained and available sites could be used more effectively (for example converting space above shops, and building on or above service yards, car parks, lock-ups and railway infrastructure); and
- Support opportunities to use the airspace above existing residential and commercial premises for new homes. In particular, they should allow upward extensions where the development would be consistent with the prevailing height and form of neighbouring properties and the overall street scene, is well designed (including complying with any local design policies and standards), and can maintain safe access and egress for occupiers.'

The NPPF makes reference to guidance contained in 'Noise Policy Statement for England (NPSE), March 2010, Department for Environmental, Food and Rural Affairs' (NPSE). The NPSE is intended to apply to all forms of noise, other than noise occurring in the workplace and includes environmental noise and neighbourhood noise of all forms.

The NPSE provides advice regarding the impact of noise which should be assessed on the basis of adverse and significant adverse effect. However, the NPSE does not provide any specific guidance on assessment methods or the noise levels at which different effects would be applicable. Moreover, the document advises that it is not possible to have '*a single objective noise-based measure...that is applicable to all sources of noise in all situations.*' It further advises that the sound level at which an adverse effect occurs is 'likely to be different for different noise sources, for different receptors and at different times'.

2.2 Planning Practice Guidance

The Department for Communities and Local Government publishes guidance on the internet in the form of the 'Planning Practice Guidance' (PPG). The guidance of PPG provides greater level of details in relation to the relevance of noise for planning following the introduction of the NPPF and NPSE.

It is stated under the heading 'How to Determine the Noise Impact' that the following should be considered by local authorities:

- *‘whether or not a significant adverse effect is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur; and*
- *whether or not a good standard of amenity can be achieved.’*

The guidance process includes identifying where noise exposure is above or below the significant observed adverse effect level and the lowest observed adverse effect level for a given situation as required by the NPSE.

The observed effects are defined in Table 1 which is taken from the section headed ‘How to Recognise when Noise could be a concern?’

Table 1: PPG Noise Guidance

PPG Noise Guidance			
Perception	Examples of Outcome	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

Under the section heading ‘What factors influence whether noise could be a Concern?’ the subjective nature of noise is discussed. It is stated that there is no simple relationship between noise levels and the impact on those affected. It is all dependent on how various factors combine in particular situations, which include:

- ‘The source and absolute level of the noise together with the time of day it occurs. Some types and level of noise will cause a greater adverse effect at night than if they occurred during the day – this is because people tend to be more sensitive to noise at night as they are trying to sleep. The adverse effect can also be greater simply because there is less background noise at night;

- For non-continuous sources of noise, the number of noise events, and the frequency and pattern of occurrence of the noise;
- The spectral content of the noise (i.e. whether or not the noise contained particular high or low frequency content) and the general character of the noise (i.e. whether or not the noise contains particular tonal characteristics or other particular features). The local topology and topography should also be taken into account along with the existing and, where appropriate, the planned character of the area.'
- 'Consideration should also be given to whether adverse internal effects can be completely removed by closing windows and, in the case of new residential development, if the proposed mitigation relies on windows being kept closed most of the time. In both cases a suitable alternative means of ventilation can be found in the Building Regulations;
- In cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in noise may result in a significant adverse effect occurring even though little to no change in behaviour would be likely to occur.
- If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.'

Similarly, to the NPSE, no specific noise parameters are defined in the guidance or target noise levels established for comparison.

2.3 Local Policy

Cherwell District Council's Local Policy has also been considered when producing this document, taken from the Planning and noise guidance section of Cherwell District Council's website.

The policy considers potential impacts from existing sources of pollution, including noise, on proposed developments considered to be sensitive to the effect of pollution. The Policy additionally considers the impact associated with the introduction of a potentially polluting development on existing sensitive receptors.

With specific regard to noise the relevant local policy states:

'Any industrial or commercial development must not cause an increase in background noise levels at the nearest noise sensitive property, or at the boundary of the property. The guidance generally recommends that noise levels within residential properties should not exceed the World Health Organisation values where practicable.'

3. GUIDANCE DOCUMENTS

3.1 British Standard 4142:2014+A1:2019

The standard method for assessing the noise impact from industrial and commercial activity is British Standard BS4142 “Method for rating and assessing industrial and commercial sound”. A BS4142 assessment is made by determining the difference between the intrusive noise under consideration (known as ‘the specific noise’) and the background noise at the receptor. The background noise, as represented by the L_{A90} parameter, is the noise level in the absence of the specific noise. The standard requires an assessment of the typical background noise level.

The specific noise is assessed in terms of the L_{Aeq} parameter but a character penalty can be applied for tonal, impulsive or intermittent characteristics. Intermittency is defined as having an identifiable on/off condition and a penalty of 3dB is applicable if “*the intermittence is readily distinctive against the residual acoustic environment*”. The specific noise should be calculated or measured over a 1 hour period during the day and a 15 minute period during the night.

The specific noise level (L_{Aeq}), with the character correction (if necessary), is known as the rating level, L_{Ar} . The standard then gives the following criteria for assessment based on the difference between the background noise (L_{A90}) and the rating noise (L_{Ar}):

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

In this context the Council’s requirement for a rating level below the background noise level will obviously also ensure a low impact.

4. PLANT NOISE PLANNING CONDITION

The existing consent for Unit B (18/00091/F) is subject to a planning condition relating to the control of noise from fixed plant and services. This condition has been reproduced below:

Planning Ref: 18/00091/F

'16. Cumulative noise output from any mechanical ventilation or fixed plant associated with the development shall be noise attenuated or mitigated so that it achieves the following levels at 1m from the nearest receptors (listed below):

a) Daytime (0.700-23.00)

i) Wretchwick Farm Cottages and Wretchwick Farm: 43dB L_{Aeq}

ii) Little Wretchwick Farm: 34dB L_{Aeq}

b) Night time (23.00-07.00)

i) Wretchwick Farm Cottages and Wretchwick farm: 31dB L_{Aeq}

ii) Little Wretchwick Farm: 28dB L_{Aeq} '

Plant noise sources associated with the Proposed Development will be controlled to the levels set out in Condition 16, above.

5. PROPOSED DEVELOPMENT

The Unit B site is located to the south-east of Bicester within Symmetry Park. The site is bounded to its northern extent by existing farmland along its eastern (Unit A1) and western (Unit C) extents by other industrial warehouse units that form part of the greater Symmetry Park estate and on the southern boundary by the existing A41. The 2018 planning consent for Unit B (18/00091/F) included for two accesses into the site, both of which are provided via Morrell Way. The locations of these accesses are shown in Figure 1.



Figure 1: Symmetry Park showing Unit B and accesses

The proposed revised Unit B site layout is presented in Figure 2, below. Potential noise sources are identified.



Figure 2: Proposed revised Unit B site layout

Note, Condition 16 as detailed in Section 4 is not considered to apply to emergency plant such as the sprinkler pump and back-up generator, which would only operate occasionally for testing and in rare emergencies.

Unit B will be operated by Ocado as a Customer Fulfilment Centre (CFC) for the delivery of groceries to customer premises using mainly light vans. The unit will receive deliveries from HGVs.

The 2018 planning consent (18/00091/F) provided for the following:

- Plot B has the capacity to deliver 15,129m² of B8 and ancillary uses B1(c);
- Own dedicated Gatehouse into the site with secure yard;
- 4 level access loading doors and 15 dock level access doors;
- 43 HGV standalone parking spaces;
- 102 car parking spaces, including 7 disabled parking spaces;
- 60 cycle parking storage
- 12 Electrical Charging Points

The intention is for the site to operate 24 hours a day, 7 days of the week, with staff working a variety of shift patterns as follows:

- Office staff 09:00-17:00 Single shift
- Production staff (Personal Shoppers) 06:00-15:00 & 20:30-06:00 2 x shifts

- Inbound staff (warehouse) 06:00-14:00 14:00 – 22:00 22:00 – 06:00 3 x shifts
- Drivers (Customer Service Team Member) 06:00-16:00 & 14:00-00:00 2 x shifts

Whilst the intention is to introduce a 24/7 operation, not all staff will be on site at the same time, for example, the warehouse roster is fairly flat throughout the week, whereas production staff and drivers are going to be organised to respond to changes in demand. Additionally, staff working night shifts tend to work 4-day weeks. Therefore, the headcount required to service the site would be greater than the peak day attendance, especially when accounting for rest days, holidays, unauthorised absence, and non-productive attendance (e.g. training).

The 24-hour timeframe for the operation of the site, as provided by the occupier Ocado, is summarised below:

"Customers will be offered 1hr delivery slots from 0600-2300 7 days a week (depending on their distance from site). Approx. a 1.5hr drive time radius from the site will be covered (delivery via 3.5t Mercedes Sprinter). Customers will place an order anything from 21 days ahead to the day before, with customers living very close to site (20-30 mins) offered a small amount of 'same-day' slots (order in the morning pre 9am for delivery post 4pm). HGV deliveries to site are predominantly from 3rd party suppliers, bringing product to site for storage within the MHE prior to picking and delivery to customer."

5.1 Trip Generation

Unit B CFC - Ocado Trip Generation Methodology was used in the Hydrock Transport Assessment (13411-HYD-XX-XX-RP-TP-4001-P05) to derive the trip generation profile associated with the CFC (Unit B).

The derived levels of trip generation are presented in Table 2. These are shown alongside the spare trip generation capacity associated with the extant permission.

Table 2: Unit B Ocado Derived & Net Trip Generation (B8 Use Class)

		AM Peak		PM Peak	
		Arrivals	Departures	Arrivals	Departures
Spare trip generation capacity	Vehicles	14	10	7	16
	HGVs	3	3	2	2
Ocado Derived Trip Generation	Vehicles	50	9	4	35
	HGVs	7	7	2	2
Net Trip Generation	Vehicles	36	1	3	19
	HGVs	4	4	0	0

6. BASELINE CONDITIONS

6.1 Survey Methodology

A background sound survey was carried out over the period Friday 10th to Monday 13th May 2019. The noise measurement location, local noise sensitive receptors and the proposed development site is shown in Figure 2.



Figure 3: Aerial photograph of site showing background sound measurement location and receptors

The noise measurement location is further from the primary noise source (A41) than The Bungalow, Windmill Cottage and Wretchwich Cottage. Therefore, actual background sound levels at these receptors may be higher than measured. Background sound levels at Little Wretchwich Farm may be slightly lower than measured but not by more than approximately 3dB (based on increased distance to the A41).

Details of the noise monitoring equipment used for the survey are provided in Table 3.

Table 3: Survey Equipment

Manufacturer	Model	Instrument Type	Serial No. / Version
Rion	NL-52	Sound level Meter	12543143
Rion	NC-74	Field Calibrator	35157401

Measurements were undertaken in accordance with the guidance in British Standards BS 4142:2014 and BS 7445-1:2003. A shorter than standard averaging time was used (5 minutes). This will tend to result in lower measured background sound levels.

The meter was unattended except for a short time during setup and collection. A wind shield was fitted to the monitoring equipment at all times. The meter was calibrated before and after the measurement period with the field calibrator. Drift in the calibration level was within normal tolerances. Copies of the equipment laboratory calibration certificates can be provided upon request.

Weather conditions during the survey have been taken from publicly available station data. There was no precipitation for the duration of the survey. Day time temperatures were 13° to 17°C falling to lows of around 1°C during the night. Winds were light (<5m/s) and from variable directions on Friday, generally north on Saturday and Sunday and east on Monday.

6.2 Survey Results

Three main acoustic parameters were measured using a time interval of 5 minutes as described below.

$L_{Aeq,T}$ dB, defined as the ‘A’ weighted equivalent continuous sound pressure level. Over a defined time period ‘T’, it is the sound pressure level equivalent to the acoustic energy of the fluctuating sound signal. It is often referred to as the ‘ambient noise level’.

$L_{Amax,F,T}$ dB, defined as the ‘A’ weighted maximum sound pressure level that occurred during the time period ‘T’ acquired using a ‘fast’ time weighting (i.e. a sample every 125ms). It is commonly used to describe the highest noise level that occurred during an event such as a vehicle pass-by.

$L_{A90,T}$ dB, defined as the ‘A’ weighted sound pressure level exceeded for 90% of the measurement period ‘T’. It is a statistical parameter and cannot be directly combined with other acoustic parameters. It is generally used to describe the prevailing background noise level.

A full-time history of the noise measurements is presented in Figure 4, below.

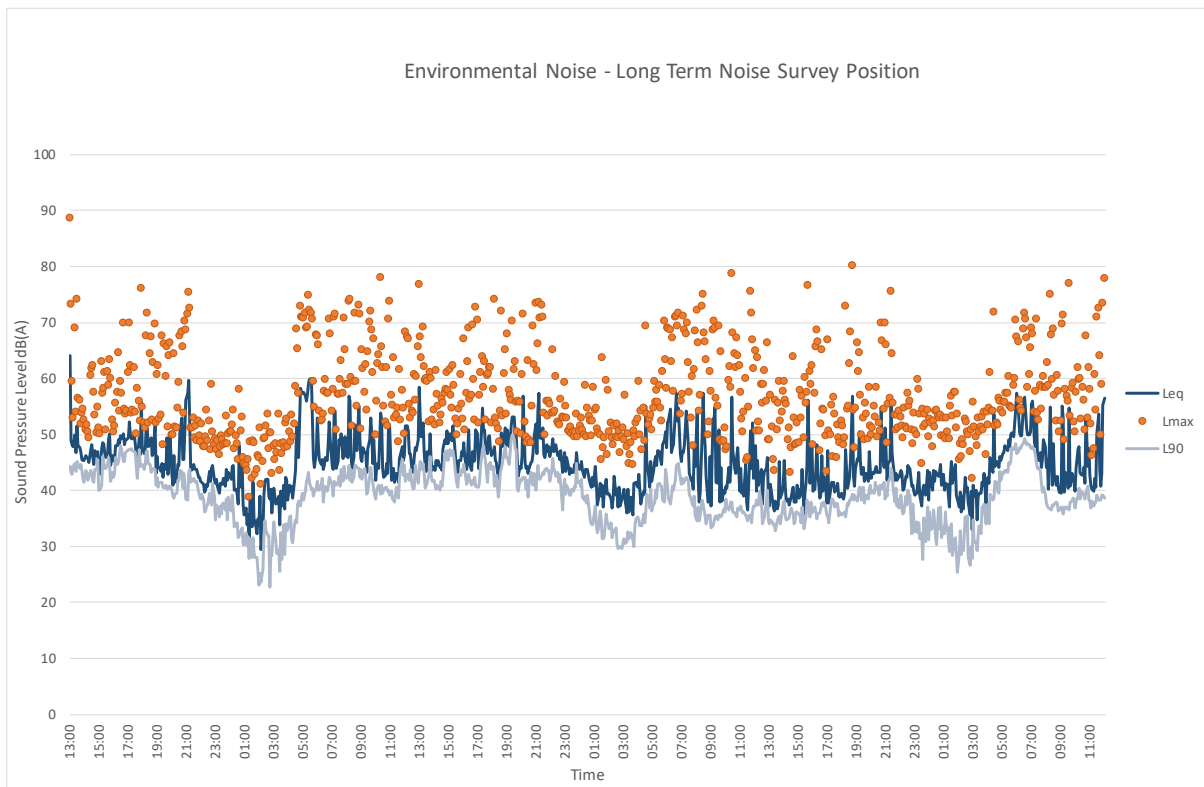


Figure 4 Environmental noise survey results

Background sound levels during the survey were slightly lower on Sunday and Monday morning than on Friday evening and Saturday. The modal average background sound levels for the daytime and night-time are presented in Table 4. Analysis of the data, including the time history plot in Figure 4, indicate this is a reasonable representation of the typical background sound level during the quietest times within each period.

Table 4: Typical Background Sound Levels

Period	Representative (Modal average) Background Noise Level LA90,5mins dB(A)
Day Time (07:00- 23:00hrs)	36
Night Time (23:00 - 07:00 hrs)	34

7. ASSESSMENT OF OPERATION NOISE LEVELS

7.1 Prediction of Specific Sound Level from Delivery and Collections

The primary noise source on the proposed site will be from deliveries and collections in the service yard to the west of the Proposed Development. The most affected receptors will be Wretchwick Cottage at approximately 280m from the site boundary and Little Wretchwick Farm at 365m. Wretchwick Cottage is screened from the Unit B yard by Unit C

Noise sources associated with deliveries and collections are as follows:

- fork lift activity;
- lorry movements;
- lorry engines idling in the service yard;
- vans movements.

Fork lift activity has been measured previously by Hydrock Consultants. The measured fork lift noise levels are presented in Table 5, below. Most of the measurements included audible reversing warnings. The measurements were made at various distances but have all been normalised to 10m. The time-weighted decibel average noise level is also presented.

Table 5: Measured Noise Levels from Fork Lift Activity

Location	Duration (seconds)	Description	L _{Aeq} , dB @ 10m
Structural Steel Factory (Hydrock library data)	12	Fork lift manoeuvring	66
Drinks Warehouse (Hydrock library data)	20	Forklift Moving pallets	65
	18	Forklift Moving pallets	53
	91	Forklift Moving pallets	64
	17	Forklift Moving pallets + 7.5 tonne lorry manoeuvring	60
	34	Forklift Moving pallets	60
	377	Forklift stacking pallets	57
	213	Forklift Loading pallets onto flatbed truck	54
	782	Average Noise Level	59

Hydrock library noise data of lorries manoeuvring in service yards are presented in Table 6. All measurements included audible reversing warnings. Again, these measurements have been normalised to a distance of 10m.

Table 6: Measured Noise Levels from Lorries Manoeuvring

Location	Description	L _{Aeq} , dB @ 10m
Drinks Warehouse	17 tonne rigid lorry manoeuvring slowly (including airbrakes)	67
	17 tonne lorry idling	62
	17 tonne lorry manoeuvring slowly	67
Sainsbury's	Articulated HGV Arriving	67

BS4142:2014 requires noise from the commercial activity (the specific sound level) to be assessed over 15 minutes during the night and 1 hour during the day. The shorter night-time assessment period generally results in higher specific noise levels for similar sources. Therefore, the greatest noise impact from the CFC are likely to be during the early hours (night-time) when HGVs are arriving at the CFC and being unloaded. Van movements are likely to be less significant and are not likely to be distinguishable from traffic on the A41 at receptors.

The night-time specific noise level at Wretchwick Cottage & Little Wretchwick Farm has been predicted based on a 15-minute period when 3 articulated lorries arrive simultaneously. The calculations are set out in Table 7 & 8, below. The following noise sources are considered:

- three articulated lorries pulling in to the CFC and manoeuvring into a loading bay;
- lorries idling for a short time;
- fork lift unloading from rear of the vehicle for the remaining time but with a period of 2 minutes outside the building per lorry.

The following assumptions are made:

- Lorries travel at 2.2 m/s on site;
- A lorry will take a maximum of approximately 42 seconds to drive from the site entrance to a loading bay (based on 91m driving distance to furthest bay and 2.2m/s on site speed);
- A lorry will take a maximum of approximately 90 seconds to manoeuvre into a loading bay;
- Three lorries will be simultaneously manoeuvring during the assessment period;
- Lorries will typically allow the engine to idle for no more than 60 seconds after pulling into a bay;
- Fork lifts will not generally operate externally but short duration external activity is possible;
- Most forklifts will operate within the building only and enter lorries via the rear door;
- Fork lift horns will not be used.

Table 7: Estimated Specific Noise Levels at Wretchwick Cottage

Noise Source	Source Noise Level (L _{Aeq} , dB)	Ref. Distance (m)	On-time (seconds)	Quantity	Distance to Receptor (m)	Ground Correction (A _{gr} , dB)	Screening Correction (A _{barr} , dB)	Receptor Noise Level (L _{Aeq} , dB)
Forklift (external)	59	10	120	3	410	0	10	22
Lorry driving on site	67	10	42	3	344	0	10	31
Lorry Manoeuvring into bay	67	10	90	3	344	0	10	31
Lorry idling	62	10	60	3	344	0	10	26
Specific noise level at receptor (L _{Aeq} 15 minute , dB)								24

Table 8: Estimated Specific Noise Levels at Little Wretchwick Farm

Noise Source	Source Noise Level (L _{Aeq} , dB)	Ref. Distance (m)	On-time (seconds)	Quantity	Distance to Receptor (m)	Ground Correction (A _{gr} , dB)	Screening Correction (A _{barr} , dB)	Receptor Noise Level (L _{Aeq} , dB)
Forklift (external)	59	10	120	3	420	3.5	0	28
Lorry driving on site	67	10	42	3	375	3.5	0	37
Lorry Manoeuvring into bay	67	10	90	3	375	3.5	0	37
Lorry idling	62	10	60	3	375	3.5	0	32
Specific noise level at receptor (L _{Aeq} 15 minute , dB)								29

The prediction of distance attenuation is based on the ISO 9613:1996 method and assumes soft ground for Little Wretchwick Farm and 10 dB screening due to Unit C at Wretchwick Cottage.

7.2 BS4142:2014 Assessment – Delivery and Collections

A BS 4142:2014 assessment of noise from the proposed CFC is presented in Table 8 & 9 for Wretchwick Cottage & Little Wretchwick Farm.

Table 9: BS4142:2014 Assessment – Deliveries and Collections at Night - Wretchwick Cottage

Results		Commentary
Background Sound Level (L _{A90} , dB)	34 dB	Measured night-time background sound levels. Actual level at receptor may be higher.
Specific Sound Level - (L _{Aeq} , dB)	24 dB	(Calculation from Table 7)
BS4142 Rating Level (L _{Ar})	24 dB	<p>No character correction is deemed to apply to CFC noise at receptors. Noise from the CFC will primarily be from lorries manoeuvring on site. This is not tonal or impulsive.</p> <p>Site activity during busy periods is expected to be almost continuous and therefore would not be intermittent at receptors.</p> <p>Noise from vehicles manoeuvring is not dissimilar to the existing dominant noise source (A41 road traffic) and therefore should not be considered distinctive against the residual acoustic environment.</p> <p>Noise from tonal reversing alarms is not expected to be prominent at these distances.</p>
Excess of Rating Level over Background Sound level (dB)	(24 - 34) = - 10 dB	The assessment indicates that noise from deliveries and collections would be a low impact at Wretchwick Cottage.

Table 10: BS4142:2014 Assessment – Deliveries and Collections at Night – Little Wretchwick Farm

Results		Commentary
Background Sound Level (L _{A90} , dB)	31 dB	Measured night-time background sound levels corrected for distance from A41. Actual level at receptor may be higher.
Specific Sound Level - (L _{Aeq} , dB)	29 dB	(Calculation from Table 8)
BS4142 Rating Level (L _{Ar})	29 dB	No character correction is deemed to apply to CFC noise at receptors. Noise from the CFC will primarily be from lorries manoeuvring on site. This is not tonal or impulsive. Site activity during busy periods is expected to be almost continuous and therefore would not be intermittent at receptors. Noise from vehicles manoeuvring is not dissimilar to the existing dominant noise source (A41 road traffic) and therefore should not be considered distinctive against the residual acoustic environment. Noise from tonal reversing alarms is not expected to be prominent at these distances.
Excess of Rating Level over Background Sound level (dB)	(29 - 31) = - 2 dB	The assessment indicates that noise from deliveries and collections would be a low impact at Little Wretchwick Farm.

The specific noise is at least 10 dB below the existing background sound level at Wretchwick Cottage and at least 2 dB below at Little Wretchwick Farm. In the semantics of BS4142:2014, “*this is an indication of the specific sound source having a low impact, depending on the context*”. The context in this case is as follows:

- Although noise from Symmetry Park is a new noise source in the area, noise from the proposed Unit B CFC is not significantly different from other consented units or noise likely under the extant Unit B permission;
- the predicted noise levels are relatively low and would often not be audible inside a dwelling even with windows open;
- the character of noise from the CFC (vehicles manoeuvring) is not dissimilar from the road traffic noise from the A41 which dominates the existing noise climate;

Therefore, in consideration of the context, as set out above, the predicted rating levels certainly represent a “*low impact*” in terms of BS 4142:2014.

BS4142:2014 requires an assessment of uncertainty. Uncertainty relating to the source noise levels is primarily due to the estimated intensity of activity. I.e. more vehicles arriving simultaneously would result in higher noise levels. However, even if all 7 HGVs estimated to arrive during the morning peak period arrived during the 15-

minute BS4142:2014 assessment period, the specific sound level would still be approximately equal to the background sound level at receptors.

The assessment indicates that the requirements of Cherwell District Council's Local Policy will be complied with.

7.3 Prediction of Specific Sound Level from Vehicle Maintenance Unit (VMU)

Hydrock have undertaken measurements of vehicle servicing and part fitting within a main dealer work shop for a previous project. Noise sources included: compressors, fume extraction, air tools, hand held tools, vehicle lifts, engines idling and revving between 2000-4000 RPM. The average ambient work shop reverberant sound pressure level was 73 dB L_{Aeq} .

The noise measurements of internal activity have been used to calculate noise emissions from the building envelope to the closest affected receptors (Wretchwick Cottage at 280m and Little Wretchwick Farm at 570m) based on the standard formula:

$$L_{ext} \text{ at housing} = L_{int} - R_{comp} - 20 \log d + 10 \log S - 11 - 6 + DI - \text{shielding}$$

Where:

- d = distance (m)
- R_{comp} = composite sound reduction index of building envelope
- S = total area of facade including openings
- DI = Directivity Index

The composite sound reduction index is based on the relative areas of the different construction elements of the building envelope. Details of the basic building construction assumed in the calculation are as follow:

- Walls & Roof: Kingspan or similar sandwich panel: 22 dB R_w
- Roller Doors (open) 0 dB R_w

From activity in the VMU, the predicted noise level is 16 dB L_{Aeq} at Wretchwick Cottage and 20 dB L_{Aeq} at Little Wretchwick Farm with roller shutter doors open.

The full calculation is provided in the Appendix A. BS4142:2014 assessments against the background sound level is set out in Tables 11 & 12, below.

Table 11: VMU BS4142:2014 Assessment (Night) - Wretchwick Cottage

Results		Commentary
Measured Background Sound Level (L_{A90} , dB)	34 dB	Measured night-time background sound levels. Actual level at receptor may be higher.
Specific Sound Level - (L_{Aeq} , dB)	16 dB	Based on prior measurements of a car service centre and the above sound insulation performance for the building.
BS4142 Rating Level (L_{Ar})	16 dB	No correction is applied for tonality or impulsivity as the predicted rating level is at least 10dB below existing background sound levels and therefore the character of the noise sources is not expected to be apparent at the receptor.
Excess of Rating Level over Background Sound level (dB)	$(16 - 34) = -18$ dB	The assessment indicates a low impact.

Table 12: VMU BS4142:2014 Assessment (Night)- Little Wretchwick Farm

Results		Commentary
Measured Background Sound Level (L_{A90} , dB)	31 dB	Measured night-time background sound levels corrected for distance from A41. Actual level at receptor may be higher.
Specific Sound Level - (L_{Aeq} , dB)	16 dB	Based on prior measurements of a car service centre and the above sound insulation performance for the building.
BS4142 Rating Level (L_{Ar})	16 dB	No correction is applied for tonality or impulsivity as the predicted rating level is at least 10dB below existing background sound levels and therefore the character of the noise sources is not expected to be apparent at the receptor.
Excess of Rating Level over Background Sound level (dB)	$(120 - 31) = -11$ dB	The assessment indicates a low impact.

The specific noise is at least 11 dB below the existing background sound level during the night. This indicates a low impact in any context. The impact would be lower for daytime operation. The assessment is based on open roller shutter doors.

Noise sources inside the VMU, such as air tools and revving engines, could in some circumstances attract a character correction under BS4142:2014. A character correction has not been added because the noise source character was not deemed to be noticeable at the receptor, given the low level relative to background. This is almost certainly true for any tonal noise components. However, there is some uncertainty over the perceptibility of impulsiveness at the receptor. If the impulsivity of noise from revving engines and air tools (for example) was distinctive at the receptor, a correction of between 3 dB and 6 dB may be appropriate. However, the assessment would still result in a low impact.

The requirements of Cherwell District Council's Local Policy are expected to be achieved by VMU noise during the day or night.

7.4 Noise from Vehicle Washing

Vehicles will be washed on the CFC site by a automated washer. Hydrock do not have any noise data for such a machine. It is not expected to be significantly louder than manual washing with a jet wash, which would not result in a significant impact during the day time.

It is proposed to control noise from vehicle washing to the corrected background sound level at receptors as set out in Table 13.

Table 13: Noise Limits at Receptors for Vehicle Washing

	Period	Representative (Modal average) Noise limit for Vehicle Washing L _{Ar} , dB(A)
Wretchwick Cottage	Day Time (07:00- 23:00hrs)	36
	Night Time (23:00 - 07:00 hrs)	34
Little Wretchwick Farm	Day Time (07:00- 23:00hrs)	33
	Night Time (23:00 - 07:00 hrs)	31

The limits in Table 13 represent a low noise impact in terms of BS4142:2014 and are suitable to achieve the requirements of Cherwell District Council's Local Policy.

Achieving the above noise limits may not require any specific mitigation and a partial enclosure is certainly expected to be adequate to control vehicle washing noise to the proposed limits.

8. TRAFFIC NOISE ASSESSMENT

BS4142:2014 is not appropriate for the assessment of road traffic noise on public highways. Highways Agency guidance on the assessment of road noise is provided in the Design Manual for Roads and Bridges (DMRB), Volume 11, Section 3. The DMRB assessment method is based on the increase in the 18-hour basic road noise levels as defined in the Calculation of Road Traffic Noise (CRTN), DoF, 1988. CRTN describes a method for predicted the basic road noise level based on 18-hour Annual Average Weekday Traffic flow rates (AAWT), HGV percentage, traffic speed and other factors. However, DMRB provides a simple method for determining if a significant noise impact is likely based on the change in flow rate:

“A change in noise level of 1 dB $L_{A10,18h}$ is equivalent to a 25% increase or a 20% decrease in traffic”

It is further noted that a change in the road noise level of less than 1 dB is negligible. Therefore, any increase in traffic flow of less than 25% is likely to be negligible with respect to noise.

From the Hydrock Transport Assessment the increase in vehicle movements resulting from the proposed development over and above the scheme already consented would result in *“one additional vehicle approximately every 2 minutes which would not have a significant impact on the road network. In terms of HGV movements accessing and egressing the site, an increase in 8 trips is predicted in the morning peak, while no changes are anticipated in the evening peak. Again, this would not result in a material impact on the local highway network.”*

The Hydrock Transport Assessment provided a comparison between 2026 Baseline flows with committed development and the 2026 Baseline flows with committed development and the proposed Unit B CFC. This is provided in Table 14 with an indication of the corresponding noise impact.

Table 14: Flow rate change at junctions from Transport Assessment and Corresponding Noise Impact

Junction	Period	2026 Base + Committed Flow	2026 Base + Development + Development Flow	% Change in Flow	Noise Impact
B4030/ A41/ Oxford Road roundabout	AM	4653	4688	1%	Negligible
	PM	5168	5176	0%	Negligible
B4100 London Road/ A4421/ A41/ Gravenhill Road North roundabout	AM	3606	3660	1%	Negligible
	PM	3966	3986	0%	Negligible
A4421/ Peregrine Way roundabout	AM	1410	1429	1%	Negligible
	PM	1557	1568	1%	Negligible
A41 / Ploughley Road T-junction	AM	2718	2775	2%	Negligible
	PM	2873	2893	1%	Negligible
Business Park Site Access / A41	AM	1884	1943	3%	Negligible
	PM	1895	1917	1%	Negligible
B4011 / A41 T-junction	AM	1857	1860	0%	Negligible
	PM	1987	1988	0%	Negligible

It is noted that the flow rates in Table 14 are for the morning and evening peak period and not 18-hour AAWTs normally used for predicting road noise levels. However, it is clear, without the need for further analysis, that the proposed development will not result in significant increases in road traffic in terms of noise.

9. SUMMARY

An assessment has been made of noise from the proposed Ocado Customer Fulfilment Centre (CFC) at Unit B, Symmetry Park, Bicester.

Noise from operation of the proposed development, including deliveries, collections and the vehicle maintenance unit, is predicted to have a low impact on local sensitive receptors and is not expected to be significant in the context of the wider symmetry park development and extant permissions. Cherwell District Council's Local Policy on noise from commercial premises (i.e. they should not result in an increase of the existing background sound level) is expected to be complied with.

Noise limits have been proposed to mitigate noise from vehicle washing on site to a low impact at receptors. These are not expected to be onerous to achieve.

The noise impact of traffic increases on local roads is negligible.

Mechanical plant noise will be controlled to the limits set out in Planning Condition 16 (18/00091/F).

Appendix A Sample of Calculations

Calculation Method: BS EN ISO 12354-4:2017
Project: Ocado CFC, Bicester
Date: 26/11/2020
Receptor: Wretchwich Cottage

		Octave Band Centre Frequency, Hz						R_w	dB(A)			
		125	250	500	1000	2000	4000					
Internal Noise level									73			
		$L_{p, inside}, dB$										
		60	60	65	70	67	62					
Sound Power of Building Side		$L_{receptor} = L_{int} + C_d - R' + 10 \log S - 20 \log d - 11 + D_c + A_s$										
Element	S, m^2	C_d	D_c	d, m	A_s							
Wall (West)	60.0	-6	0	280	-10	15	19	23	24	22	40	24
Sound Pressure Level	L_{wp}, dB					-13	-17	-16	-13	-13	-36	-9
Wall (North)	65.0	-6	0	280	-10	15	19	23	24	22	40	24
Sound Pressure Level	L_{wp}, dB					-13	-16	-16	-12	-13	-35	-8
Wall (South)	65.0	-6	0	280	-10	15	19	23	24	22	40	24
Sound Pressure Level	L_{wp}, dB					-13	-16	-16	-12	-13	-35	-8
Roof	156.0	-6	0	280	-10	15	19	23	24	22	40	24
Sound Pressure Level	L_{wp}, dB					-9	-13	-12	-8	-9	-32	-4
Door	40.5	-3	0	280	-10	0	0	0	0	0	0	0
Sound Pressure Level	L_{wp}, dB					3	4	8	13	10	6	16
Total Sound Pressure Level at Receptor												
SPL at Receptor		L_p, dB							16			
		4	4	8	13	10	6					

Calculation Method: BS EN ISO 12354-4:2017
Project: Ocado CFC, Bicester
Date: 26/11/2020
Receptor: Wretchwich Cottage

		Octave Band Centre Frequency, Hz						R_w	dB(A)			
		125	250	500	1000	2000	4000					
Internal Noise level									73			
		$L_{p, inside}, dB$										
		60	60	65	70	67	62					
Sound Power of Building Side		$L_{receptor} = L_{int} + C_d - R' + 10 \log S - 20 \log d - 11 + D_c + A_s$										
Element	S, m^2	C_d	D_c	d, m	A_s							
Wall (West)	60.0	-6	0	570	0	15	19	23	24	22	40	24
Sound Pressure Level	L_{wp}, dB					-9	-13	-12	-9	-9	-32	-5
Wall (North)	65.0	-6	0	570	0	15	19	23	24	22	40	24
Sound Pressure Level	L_{wp}, dB					-9	-13	-12	-8	-9	-32	-4
Wall (South)	65.0	-6	0	570	0	15	19	23	24	22	40	24
Sound Pressure Level	L_{wp}, dB					-9	-13	-12	-8	-9	-32	-4
Roof	156.0	-6	0	570	0	15	19	23	24	22	40	24
Sound Pressure Level	L_{wp}, dB					-5	-9	-8	-5	-5	-28	-1
Door	40.5	-3	0	570	0	0	0	0	0	0	0	0
Sound Pressure Level	L_{wp}, dB					7	7	12	17	14	9	20
Total Sound Pressure Level at Receptor												
SPL at Receptor		L_p, dB							20			
		8	8	12	17	14	9					