APT

AIR PRESSURE TESTING LTD

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NOISE ASSESSMENT REPORT

For

5 flats at 4 Bladon Close
Oxford
OX2 8AD

Report for:	ONIK DOM Ltd 13 Edward Road Oxford OX1 5LH
Testing By:	Air Pressure Testing Ltd Sayells Farm 7 Harlington Road Upper Sundon Bedfordshire LU3 3PE E-mail: info@airpressuretesting.net
File Reference:	APT/07206-B
Date:	1st December 2020
Authors	Darren Heliwell

Contents

1.0 DOCUMENT CONTROL

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1.1 EXECUTIVE SUMMARY

On the instructions of Onik Dom Ltd, APT Acoustics, a division of Air Pressure Testing Limited has carried out a noise assessment of the site at the rear of 4 Bladon Close, Oxford, OX2 8AD.

The development consists of the demolition of an existing house and the construction of a new block of 5 flats.

The Local Authority has requested the Noise Assessment to check the impact of existing noise sources on the internal noise levels of the proposed dwellings. The internal noise levels should not exceed 35 dB LAeq during the daytime period (07:00 to 23:00) and 30 dB LAeq during the night time period (23:00 to 07:00).

The survey and report have been commissioned to determine the existing background noise levels at the site with a view to proposing mitigation measures (if required) to ensure that the noise levels within the dwellings meet the design criteria proposed by BS8233:2014 *"Guidance on Sound Insulation and Noise Reduction for Buildings."*

2.0 Project Details

2.1 The Development

The proposed project consists of the conversion of an existing garage into a new house.

2.2 The Test Organisation

Name of test organisation: APT Acoustics

Personnel undertaking Survey: Darren Helliwell

2.3 Project Brief

The project was carried out to an agreed brief as set out in APT proposal letter dated 24th November 2020 and has included the following tasks.

- On site noise monitoring in order to determine the noise level at the site for the full daytime (16 hours L_{Aeq}) and night time (8 hours L_{Aeq}) periods, based on 24 hours unmanned monitoring.
- Recommendations for acoustic insulation of the proposed property if required.

2.4 Potential Noise Sources Identified

The site is located in a no through road, just off Woodstock Road, A4144. The site is approx. 300m to the south of Wolvercote Roundabout.

The site is also located next to the railway line serving Oxford Railway Station.

3. NOISE CRITERIA

3.1. The National Planning Policy Framework

In March 2012, the National Planning Policy Framework (NPPF) was published to replace the National Planning Policy Guidance, including guidance on noise. The intention was to let councils decide their own priorities though their Local Plans and reduce the amount of "red tape" to enable growth and development. Amongst many other documents, the NPPF replaces the 1994 document *Planning Policy Guidance Note 24 (PPG 24) 'Planning and Noise'* published by the then Department of Environment, which has now been officially withdrawn as official government guidance.

The NPPF includes 12 core planning principles which include:

- Always seek to secure high quality design and a good standard of amenity for all existing and future occupants of buildings;
- Take account of the different roles and character of different areas, promoting the vitality of the main urban areas, protecting the Green Belts around them, recognising the intrinsic beauty of the countryside;
- Contribute to conserving and enhancing the natural environmental and reducing pollution;
- Take account of and support local strategies to improve health, social and cultural well being for all.

It also states that the planning system "*should contribute to enhance the natural environment, by... preventing both new and existing development from contributing to or being put at risk from, or being adversely affected by unacceptable levels of soil, air, water or noise pollution…To prevent unacceptable risks from pollution, planning policies and decisions should ensure that new development is appropriate for its location*".

Section 123 of the NPPF talks specifically about noise stating that *"Planning policies and decisions should aim to:*

- *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;*
- *Identify and protect areas of tranquility which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

The purpose of the NPPF is for Local Planning Authorities to determine for themselves whether a "*new development is appropriate for its location"* or how to determine what constitutes "*a good standard of amenity for all…future occupants of buildings"*.

3.2. Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) 2 provides further guidance on the interpretation of Section 123 of the NPPF and states that:

"Within the context of sustainable development:
• avoid significant adverse impacts on health and quality of life;
• mitigate and minimise adverse impacts on health and quality of life; and
• where possible contribute to the improvement of health and quality of life."

NPSE introduces established concepts originally from the field of toxicology that are now being applied to noise impacts. They are:

- **NOEL – No Observed Effect Level** - This is the level of noise below which no effect can be detected. In simple terms, below this level, there is no detectable effect on health and quality of life due to the noise.

- **LOAEL – Lowest Observed Adverse Effect Level** - This is the level of noise above which adverse effects on health and quality of life can be detected.

- **SOAEL – Significant Observed Adverse Effect Level** - This is the level above which Significant adverse effects on health and quality of life occur.

NPSE goes on to state that *"it is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors and at different times. It is acknowledged that further research is required to increase our understanding of what may constitute a significant adverse impact on health and quality of life from noise. However, not having specific SOAEL values in the NPSE provides the necessary policy flexibility until further evidence and suitable guidance is available."*

3.3. BS 8233: 2014 *'Guidance on sound insulation and noise reduction for buildings'*

Originally published in 1999, the 2014 edition of BS 8233 significantly updates the guidance in light of the policy changes as a result of the advent of the NPPF and the withdrawal of PPG 24. The 2014 edition of BS 8233 sees a change in the title of the Standard, moving from a *'Code of Practice'* to *'Guidance'*, as the text *'largely comprises guidance that does not support claims of compliance'*.

BS 8233:2014 indicates that to control external noise ingress into a proposed development, a number of planning stages should occur as follows:

"a) Assess the site, identify significant existing and potential noise sources, measure or estimate noise levels, and evaluate layout options.
b) Determine design noise levels for spaces in and around the building(s).
c) Determine sound insulation of the building envelope, including the ventilation strategy".
BS 8233:2014 suggests design noise levels for various types of building. The recommended noise levels for d welling houses, flats and rooms in residential use (when unoccupied) can be seen in **Table 3.2** below.

This is replicated from Table 4 of Section 7.7.2 of BS 8233:2014. The guidance suggests that *"In general, for steady external noise sources, it is desirable that the internal ambient noise level does not exceed the guideline values".* The noise levels in **Table 3.2** are marginally different to those published in BS 8233:1999 *'Sound insulation and noise reduction for buildings –Code of practice'*, but are based on the existing guidance from the current World Health Organisation (WHO) *"Guidelines on Community Noise".*

Table 3.2: Summary of Noise Criteria: BS8233:2014

Activity	**Room Type**	(07.00 – 23.00)	(23.00 – 07.00)
Resting	Living & Dining	35 dB(A)	-
Dining	Dining Room/Area	40 dB(A)	-
Sleeping (Daytime Resting)	Bedrooms	35dB(A)	30 dB(A)

When considering the noise level criteria considered in **Table 3.2**, the following points should be noted:

1. BS 8233: 2014 suggests that the above criteria should be adopted flexibly and that *"where development is considered necessary or desirable... the internal target level may be relaxed by up to 5 dB and reasonable internal conditions still achieved".*

2. The noise levels quoted above are annual averages and *"do not need to be achieved in all circumstances"* e.g. New Years Eve or fireworks night.

3. The noise levels in **Table 3.2** are "*for steady external noise sources"* such as traffic noise or plant noise. This is a departure from the 1999 version of BS 8233, where the recommended internal noise levels were irrespective of the external noise source and therefore included the suggestion that in order to achieve *"reasonable"* noise levels within bedrooms at night, L_{AFmax} noise levels should not exceed 45 dB. Whilst this has been omitted from the 2014 version of BS 8233, it does state that "*Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values."*

Therefore, at sites which may be affected by individual noise events, it is more appropriate to use the guidance contained within the WHO *"Guidelines on Community Noise"* which suggest that good sleep will not generally be affected if internal levels of L_{AFmax} 45 dB are not exceeded more than 10-15 times per night.

4. BS 8233:2014 notes that if the design of the building is *"relying on closed windows to meet the guide values, there needs to be appropriate alternative ventilation that does not compromise the façade insulation or resulting noise level".*

5. BS 8233 provides guidance for noise in gardens and outdoor amenity space. It suggests that *"it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T,}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments."* The guidance does go on to say that these guideline values are not achievable in all circumstances and in some areas, *"such as city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.*

3.3 Local Authority Criteria

The Planning Condition set by the Local Authority follows the guidance in BS8233:2014 and requires the development *to achieve as a minimum standard an internal noise level of 30dB $L_{Aeq,(23:00-07:00)}$ for bedrooms and 35 dB $L_{Aeq,\ (07:00-23:00)}$ for habitable rooms.*

4.0 Noise Survey

4.1 General

The rear façade (nearest the railway line) is clearly the noisiest location at the site in terms of Noise.

The microphone was set up on a pole extending above the site boundary wall over the following 24 hour period: 11:00 hours on 30th November 2020 to 11:00 on 1st December 2020.

Noise Measurements were taken using a Norsonic 140 Sound Meter. The Sound Meter was calibrated at the start and end of the survey and no variation in level was noted. Sound level measurements were recorded of the L_{Aeq}, L_{90} and L_{Amax} noise levels over sample periods of 1 hour duration.

4.2 Instrumentation

Item	Serial No	Date of last calibration	Calibration Certificate No	Expiry date
Norsonic 140 Investigator, modular precision sound analyser, loaded with Building Acoustics Module	1403184	26 MAR 2019	U31363	31 MAR 2021
Norsonic Type 1225 Microphone	96088	26 MAR 2019	U31362	31 MAR 2021
Norsonic External Weatherproof Microphone Kit	N/A	N/A	N/A	N/A
Norsonic type 1251 calibrator	31970	20 MAR 2020	U34423	31 MAR 2021

5.0 Results

The noise levels recorded at the measurement position are shown as time histories on the charts in APPENDIX C.

The period averaged L_{Aeq} 1h levels measured are summarised below.

Table 5.1 – Summary of Measured Levels

Measurement Period	Highest Recorded LAeq (1 hour) (dB)	Highest Recorded LAmax (dB)	Lowest L_{A90} (dB)	L_{Aeq} (T) (dB)
07.00 to 23.00	**56.9 (between 19:00 and 20:00)**	**79.7**	**45.6**	**54.5**
23.00 to 07.00	**55.4 (between 06:00 and 07:00)**	**72.8**	**42.8**	**50.4**

6.0 Design Consideration for Residential Developments.

6.1 Building Fabric Insulation

The values for the $L_{Aeq.16hours}$ (Daytime) and $L_{Aeq.8hours}$ (Night time) are shown in Table 5.1.

For this survey the $L_{Aeq16\ hours}$ value for the daytime period was 54.5 dB and the $L_{Aeq\ 8hours}$ value for the night time period was 50.4 dB.

BS 8233 provides guidance values for a range of ambient noise levels within residential properties as shown in Table 6.1.1 below.

Table 6.1.1: Summary of Noise Criteria: BS8233:2014

Activity	**Room Type**	(07.00 – 23.00)	(23.00 – 07.00)
Resting	Living & Dining	35 dB(A)	-
Dining	Dining Room/Area	40 dB(A)	-
Sleeping (Daytime Resting)	Bedrooms	35dB(A)	30 dB(A)

BS8233 also provides typical sound insulation values for masonry perimeter walls and traditional pitched roof as follows:

A traditional pitched roof with concrete tiles and a 9 mm plasterboard ceiling, covered in thermal insulating material, has an insulation of approximately 43 dB

A masonry cavity wall will have a sound insulation of at least 50 dB, sometimes as high as 55 to 60 dB.

In most buildings, the weakest point of the facade will be the windows and doors, which provide the weak path for air-borne sound transmission.

BS8233 also provides typical sound insulation values for windows (when sound attenuating trickle ventilators are used), which are as follows:

- Partly opened window 10-15 dBA
- Single-glazed window (4mm Glass) 23-25 dBA
- Double glazing 30 dBA

In order to meet the requirements of BS8233 the windows would need to provide the following sound insulation values:

Event	Maximum Recorded Noise Level (dB)	Maximum Noise Level from BS8233 (dB)	Level of Sound Insulation required (dB)
Maximum Day time noise level $L_{Aeq\ (1\ hours)}$	**56.9**	**40**	**16.9**
Maximum Night time noise level $L_{Aeq\ (1\ hour)}$	**55.4**	**30**	**25.4**
Night time noise levels $L_{Amax(1\ hour)}$	**72.8**	**45**	**27.8**

In order to meet the requirements of BS8233:2014 a glazing system capable of providing sound insulation of approx. 29 dB would be required, provided the windows can remain closed and are not relied upon to be opened for providing natural ventilation.

A sound reduction of up to 30 dB can usually be achieved using a typical double glazing system made up of standard 6mm glass panes separated by 16mm cavity. Changing the outside 6mm layer to a laminated layer can increase the Sound Reduction up to 40dB.

The WHO guidelines form the basis of the guidance contained within BS8233:2014. However, it is important to note that there are a few pieces of guidance that have not been directly transposed into BS8233:2014 that are relevant to this development.

The guidance states that in order to obtain an internal L_{Aeq} of 30dB with windows open for ventilation, the external L_{Aeq} should not exceed 45dB.

General Considerations
The condition is specific to traffic noise rather than industrial noise. Therefore, for a development to be sustainable, it is assumed that it would not be necessary to fix the windows shut. Rather you would allow the occupant(s) to be able to choose if they do want to shut windows provided that adequate trickle ventilation is maintained in accordance with the Building Regulations.

Indeed, failure to offer such would result in a fixed glazing solution, for which a mechanical ventilation system would have to be introduced to comply with Building Regulations. This does not address the issue of thermal comfort (i.e. overheating) and neither is it considered sustainable.

Trickle vents will be required to maintain background ventilation rates if occupiers choose to close the windows. However, standard specification units such as the Titon Trimvent Select S13 surface mounted slot ventilator will provide adequate noise mitigation (Acoustic D n,e,w (+/-)- vent open 33 (-1;0), vent closed 45 (-1;-2).

Varying commercial suppliers exist for both glazing and ventilation elements and it is not expected that any standard double glazing units or trickle ventilator configuration will fail to provide the minimum reduction in this instance. However, for the purposes of clarity any glazing unit to trickle vent shall need to achieve a minimum sound reduction of $27dB_{RTA}$.

6.2 Residential Amenity

The recorded noise levels show that the $L_{Aeq(16\ hour)}$ daytime noise level is above the desired limit value for Residential Amenity of 50 dB L_{AeqT} by approx. 4.5 dB.

The recorded noise levels show that the $L_{Aeq(16\ hour)}$ daytime noise level is below the upper guideline limit value for Residential Amenity of 55 dB L_{AeqT} by approx. 0.5 dB and is therefore within the requirements.

7.0 Conclusion

The measurements of the existing background noise level measurements have been undertaken at the site at 4 Bladon Close, Oxford. The results of the measurements have been used in order to determine whether the noise levels meet the internal L_{Aeq} noise level limits.

The recorded noise levels show that the $L_{Aeq(16\ hour)}$ daytime internal noise level limits are not exceeded in the lounge and the $L_{Aeq(8\ hour)}$ night time internal noise level limits are not exceeded in the bedroom using a double glazing which is capable of achieving 30 dB Sound Reduction, providing the windows do not need to be opened for ventilation or summer cooling.

The acoustic assessment demonstrates that the site is in fact quiet and that road traffic has only a small degree of impact upon it. Therefore, acceptable internal levels for road traffic noise can be readily achieved through typical double glazing and trickle vent. Therefore, no scheme is required.

APPENDIX A: ACOUSTIC TERMINOLOGY

The Decibel, dB

The unit used to describe the magnitude of sound is the decibel (dB) and the quantity measured is the sound pressure level. The decibel scale is logarithmic and it ascribes equal values to proportional changes in sound pressure, which is a characteristic of the ear. Use of a logarithmic scale has the added advantage that it compresses the very wide range of sound pressures to which the ear may typically be exposed to a more manageable range of numbers. The threshold of hearing occurs at approximately 0 dB (which corresponds to a reference sound pressure of 2×10^{-5} Pascal's) and the threshold of pain is around 120 dB.

The sound energy radiated by a source can also be expressed in decibels. The sound power is a measure of the total sound energy radiated by a source per second, in watts. The sound power level, L_w is expressed in decibels, referenced to 10^{-12} watts.

dB(A)

The human ear is more susceptible to mid-frequency noise than the high and low frequencies. To take account of this when measuring noise, the 'A' weighting scale is used so that the measured noise corresponds roughly to the overall level of noise that is discerned by the average human. It is also possible to calculate the 'A' weighted noise level by applying certain corrections to an un-weighted spectrum. The measured or calculated 'A' weighted noise level is known as the dB(A) level. Because of being a logarithmic scale noise levels in dB(A) do not have a linear relationship to each other. For similar noises, a change in noise level of 10dB(A) represents a doubling or halving of subjective loudness. A change of 3dB(A) is just perceptible.

Frequency, Hz

Frequency is analogous to musical pitch. It depends upon the rate of vibration of the air molecules which transmit the sound and is measure as the number of cycles per second or Hertz (Hz). The human ear is sensitive to sound in the range 20 Hz to 20,000 Hz (20 kHz).
For acoustic engineering purposes, the frequency range is normally divided up into discrete bands. The most commonly used bands are octave bands, in which the upper limiting frequency for any band is twice the lower limiting frequency, and one-third octave bands, in which each octave band is divided into three. The bands are described by their centre frequency value and the ranges which are typically used for building acoustics purposes are 63 Hz to 4 kHz (octave bands) and 100 Hz to 3150 Hz (one-third octave bands).

L_{An} (e.g. L_{A10}, L_{A90})

If a non-steady noise is to be described it is necessary to know both its level and the degree of fluctuation. The L_n indices are used for this purpose, and the term refers to the level exceeded for n% of the time, hence L10 is the level exceeded for 10% of the time and as such can be regarded as the 'average maximum level'. Similarly, L_{90} is the average minimum level and is often used to describe the background noise.

L_{eq}

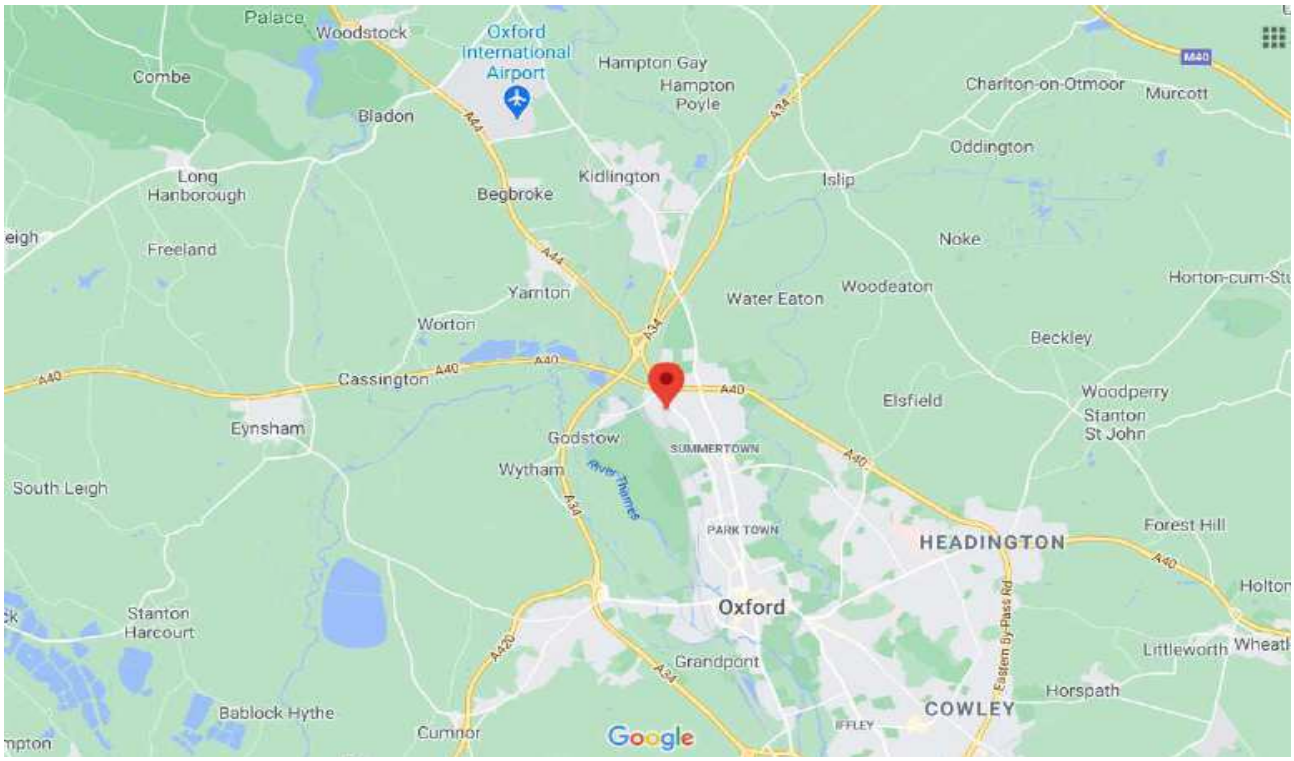
The concept of L_{eq} (equivalent continuous sound level) has up to recently been primarily used in assessing noise in industry but seems now to be finding use in defining many other types of noise, such as aircraft noise, environmental noise and construction noise. L_{eq} is defined as a notional steady sound level which, over a stated period of time, would contain the same amount of acoustical energy as the actual, fluctuating sound measured over that period (1 hour).

L_{Aeq}

The level of notional steady sound which, over a stated period of time, would have the same A-weighted acoustic energy as the A-weighted fluctuating noise measured over that period.

APPENDIX B

MAPS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Murcott
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Begbroke
Freeland
Noke
Yarnton
Water Eaton
Woodeaton
Horton-cum-St
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Beckley
Cassington
Elsfield
Woodperry
Stanton St John
Eynsham
Godstow
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HEADINGTON
Forest Hill
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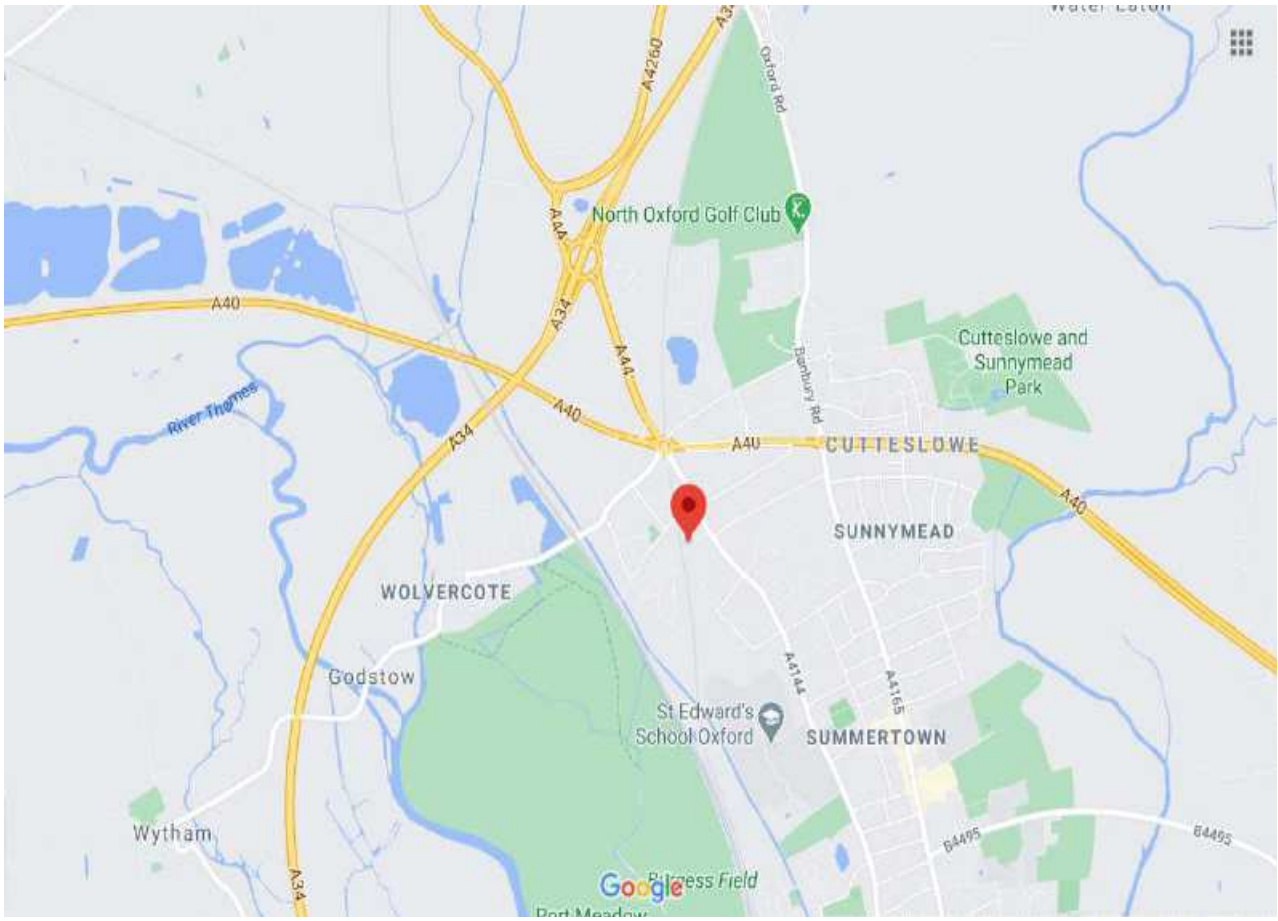
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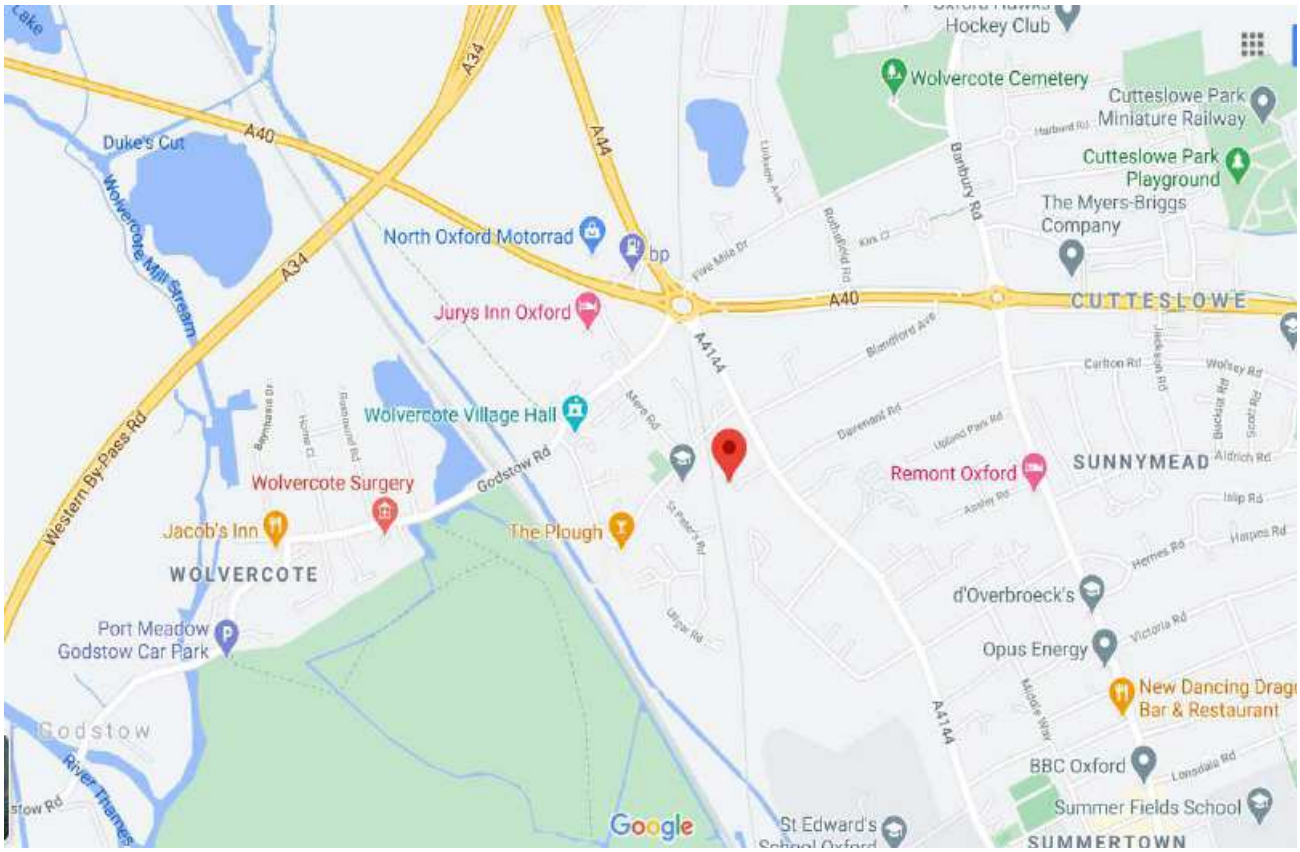
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Wolvercote Cemetery
Cutteslowe Park
Miniature Railway
Cutteslowe Park
Playground
The Myers-Briggs
Company
Duke's Cut
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A34
A44
Wolvercote Mill Stream
North Oxford Motorrad
bp
Jurys Inn Oxford
A40
CUTTESLOWE
A4144
Wolvercote Village Hall
Western By-Pass Rd
Wolvercote Surgery
Godstow Rd
Remont Oxford
SUNNYMEAD
Jacob's Inn
The Plough
WOLVERCOTE
d'Overbroeck's
Port Meadow
Godstow Car Park
Opus Energy
New Dancing Drag
Bar & Restaurant
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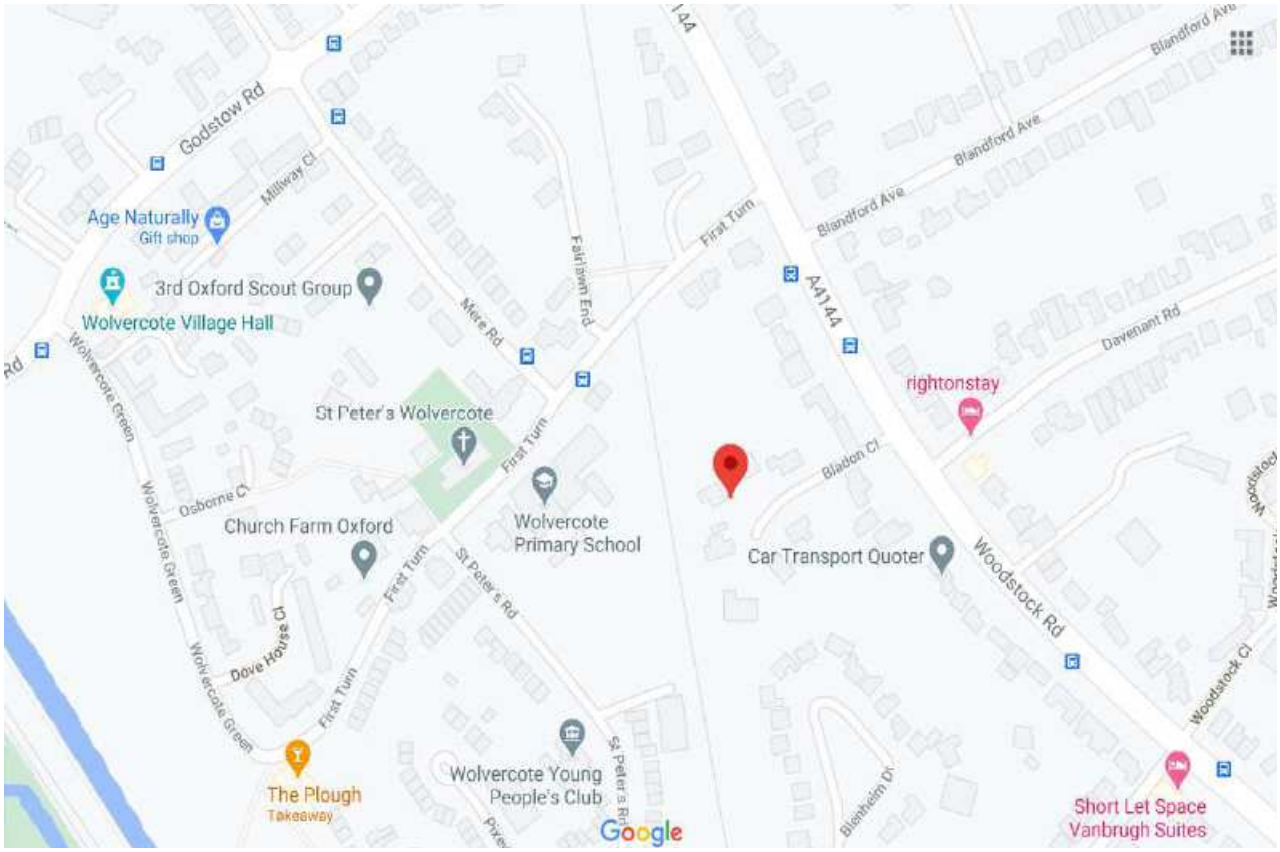
River Thames
BBC Oxford
Summer Fields School
Google
St Edward's
SUMMERTOWN


Godstow Rd
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Age Naturally
Gift shop
3rd Oxford Scout Group
Wolvercote Village Hall
Mere Rd
Fairlawn End
First Turn
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Davenant Rd
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St Peter's Wolvercote
Bladon Cl
Church Farm Oxford
Wolvercote
Primary School
Car Transport Quoter
Woodstock Rd
St Peter's Rd
Dove Houses Cl
The Plough
Takeaway
Wolvercote Young
People's Club
Google
Blenheim Dr
Short Let Space
Vanbrugh Suites


Wolvercote
Primary School
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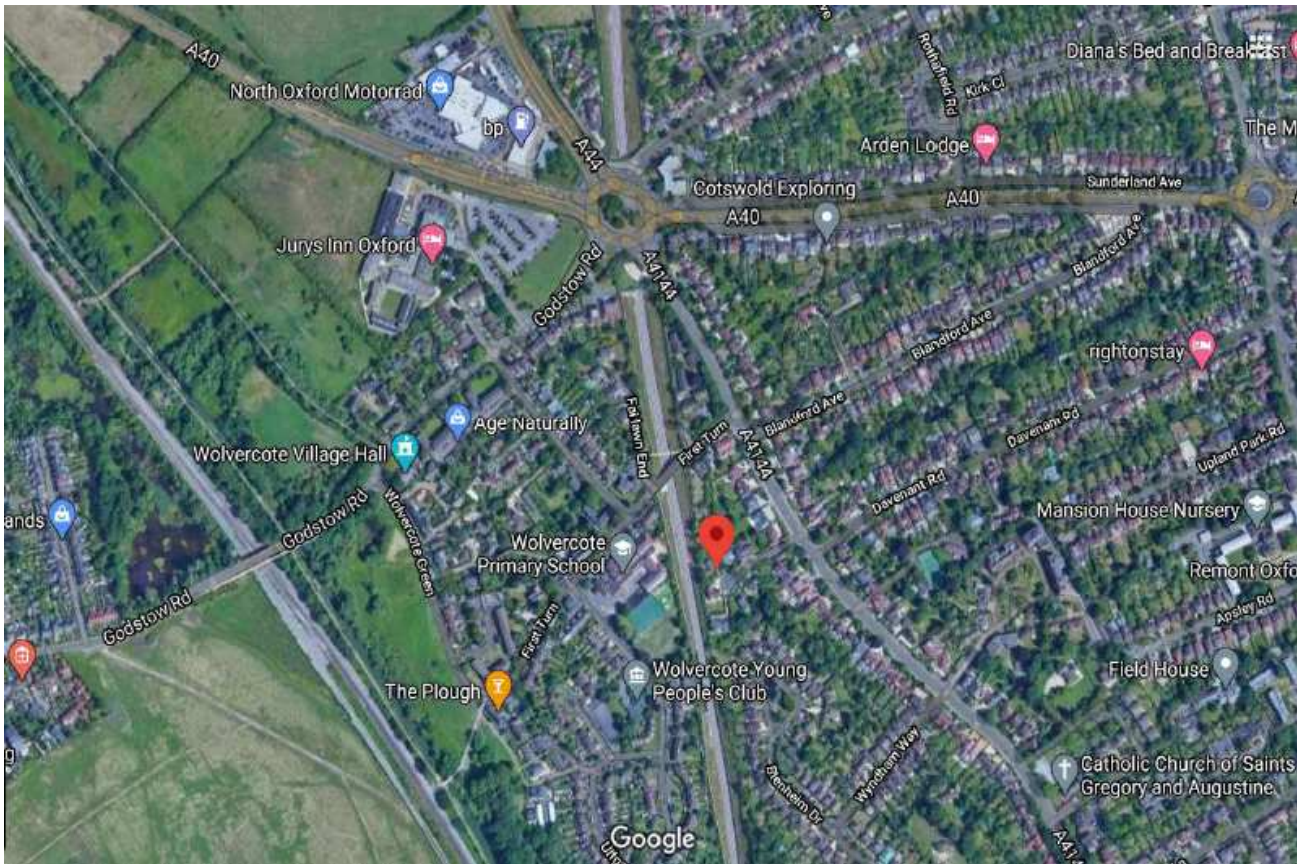
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First Turn
Fiddletown End
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Blandford Ave
Davenant Rd
Davenant Rd
Upland Park Rd
Mansion House Nursery
Godstow Rd
Wolvercote Green
Wolvercote
Primary School
Remont Oxfo
Godstow Rd
Apsley Rd
First Turn
The Plough
Wolvercote Young
People's Club
Field House
Catholic Church of Saints
Gregory and Augustine
Blenheim Dr
Wyndham Way
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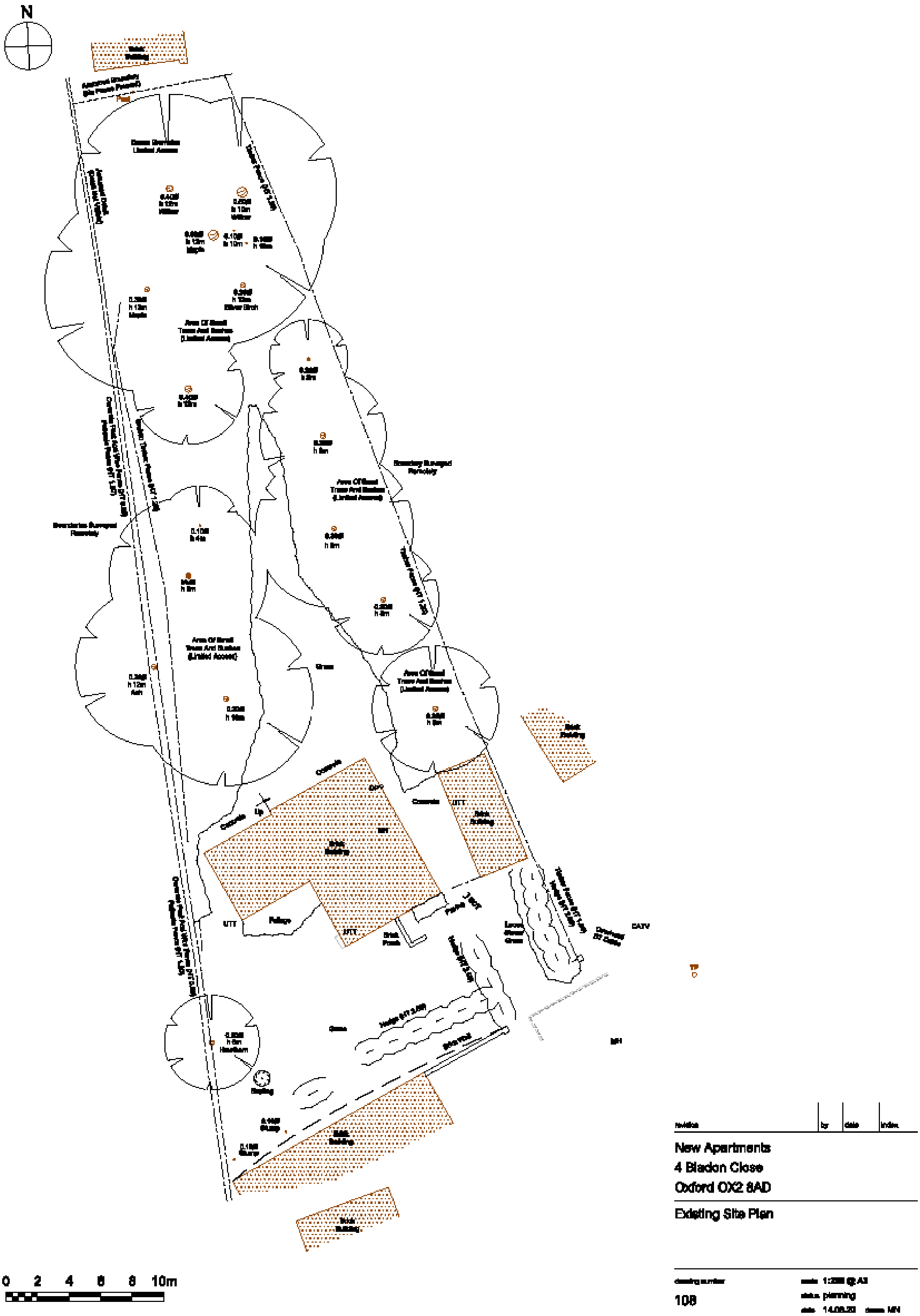
APPENDIX C

SITE PLANS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Oxford OX2 8AD
Existing Site Plan
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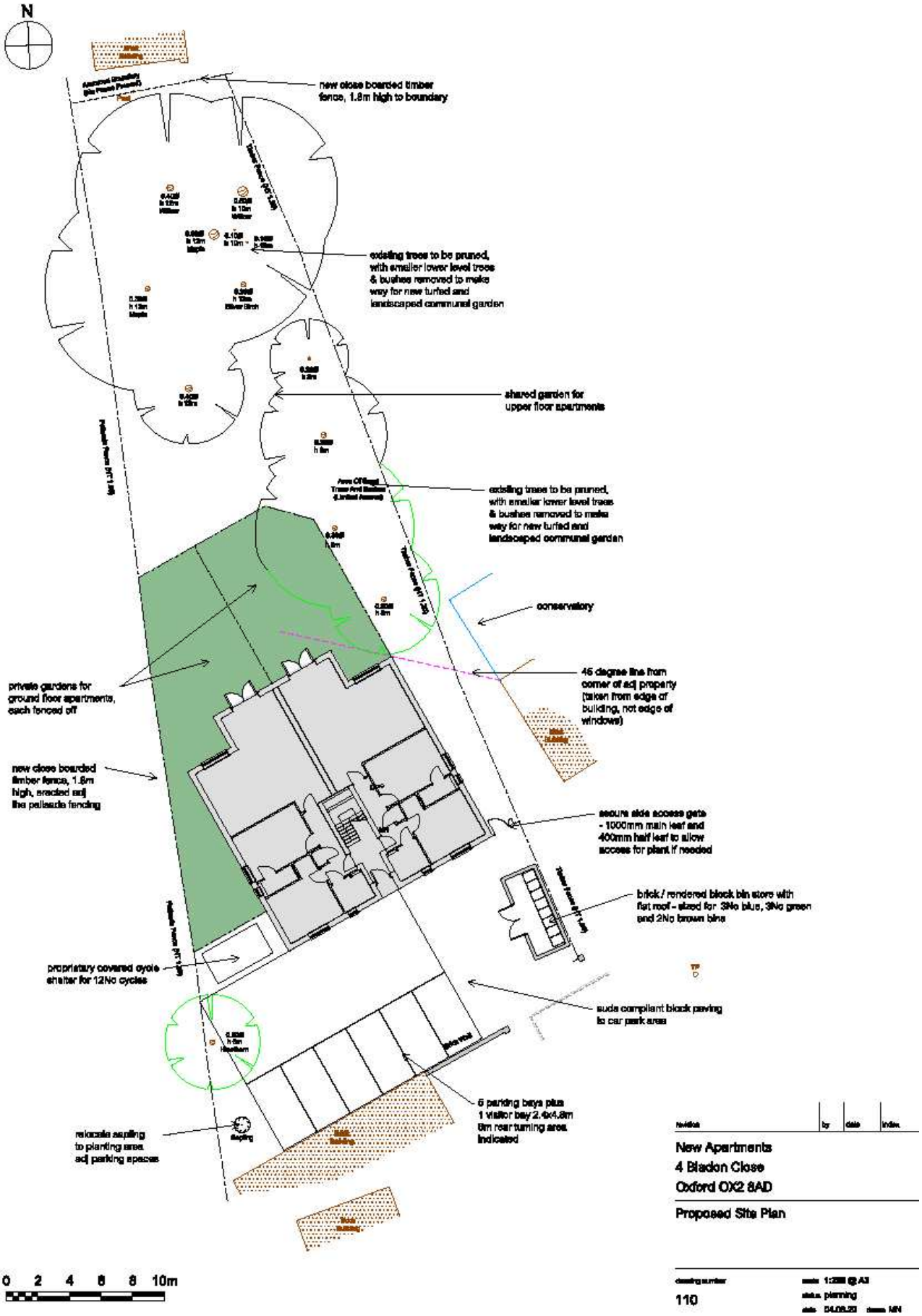
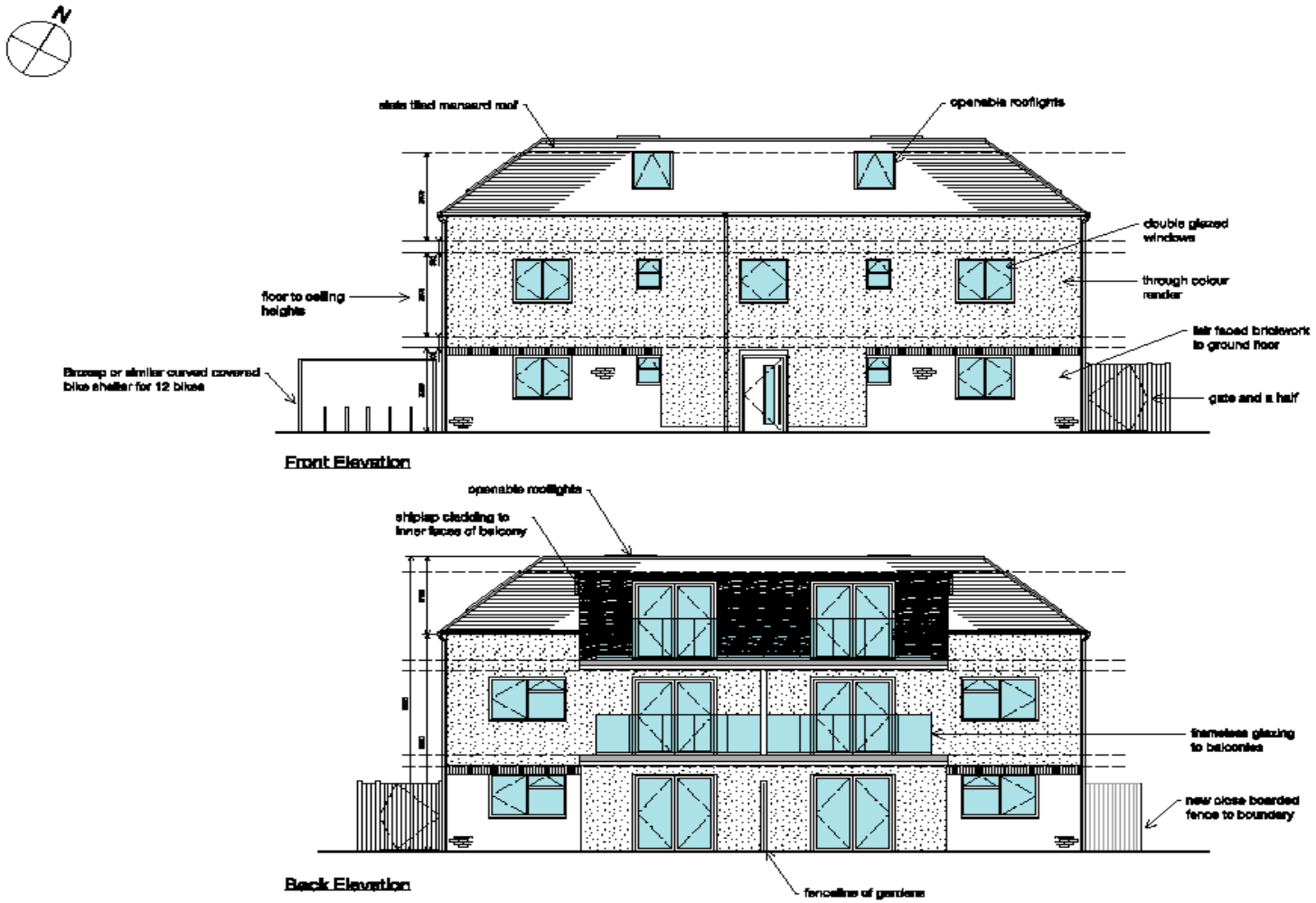
status planning


N
new close boarded timber fence, 1.8m high to boundary
existing trees to be pruned, with smaller lower level trees & bushes removed to make way for new turfed and landscaped communal garden
shared garden for upper floor apartments
existing trees to be pruned, with smaller lower level trees & bushes removed to make way for new turfed and landscaped communal garden
conservatory
private gardens for ground floor apartments, each fenced off
45 degree line from corner of adj property (taken from edge of building, not edge of windows)
new close boarded timber fence, 1.8m high, erected adj the palisade fencing
secure side access gate - 1000mm main leaf and 400mm half leaf to allow access for plant if needed
brick / rendered block bin store with flat roof - sized for 3No blue, 3No green and 2No brown bins
proprietary covered cycle shelter for 12No cycles
suds compliant block paving to car park area
6 parking bays plus 1 visitor bay 2.4x4.8m 6m rear turning area indicated
relocate sapling to planting area adj parking spaces
0 2 4 6 8 10m
New Apartments
4 Bladon Close
Oxford OX2 8AD
Proposed Site Plan
110
planning



revision	by	date	index

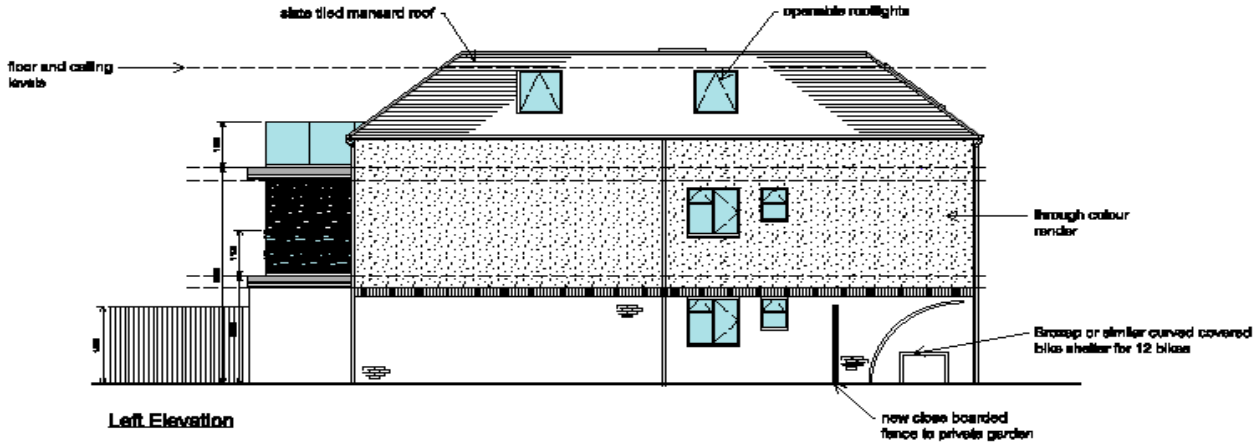
New Apartments
4 Bladon Close
Oxford OX2 8AD

Proposed Elevations
Front and Back

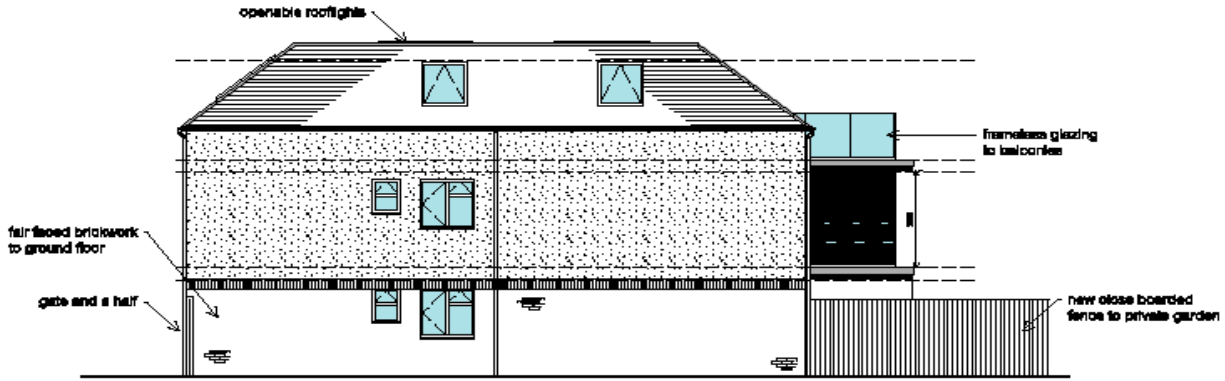
drawing number
310

scale 1:100 @ A3
status planning
date 14.08.20 drawn MN

0 1 2 3 4 5m



Left Elevation



Right Elevation

revision	by	date	index

New Apartments
4 Bladon Close
Oxford OX2 8AD

Proposed Elevations
Left and Right

drawing number
311

scale 1:100 @ A3
status planning
date 14.08.20 drawn MN

APPENDIX D

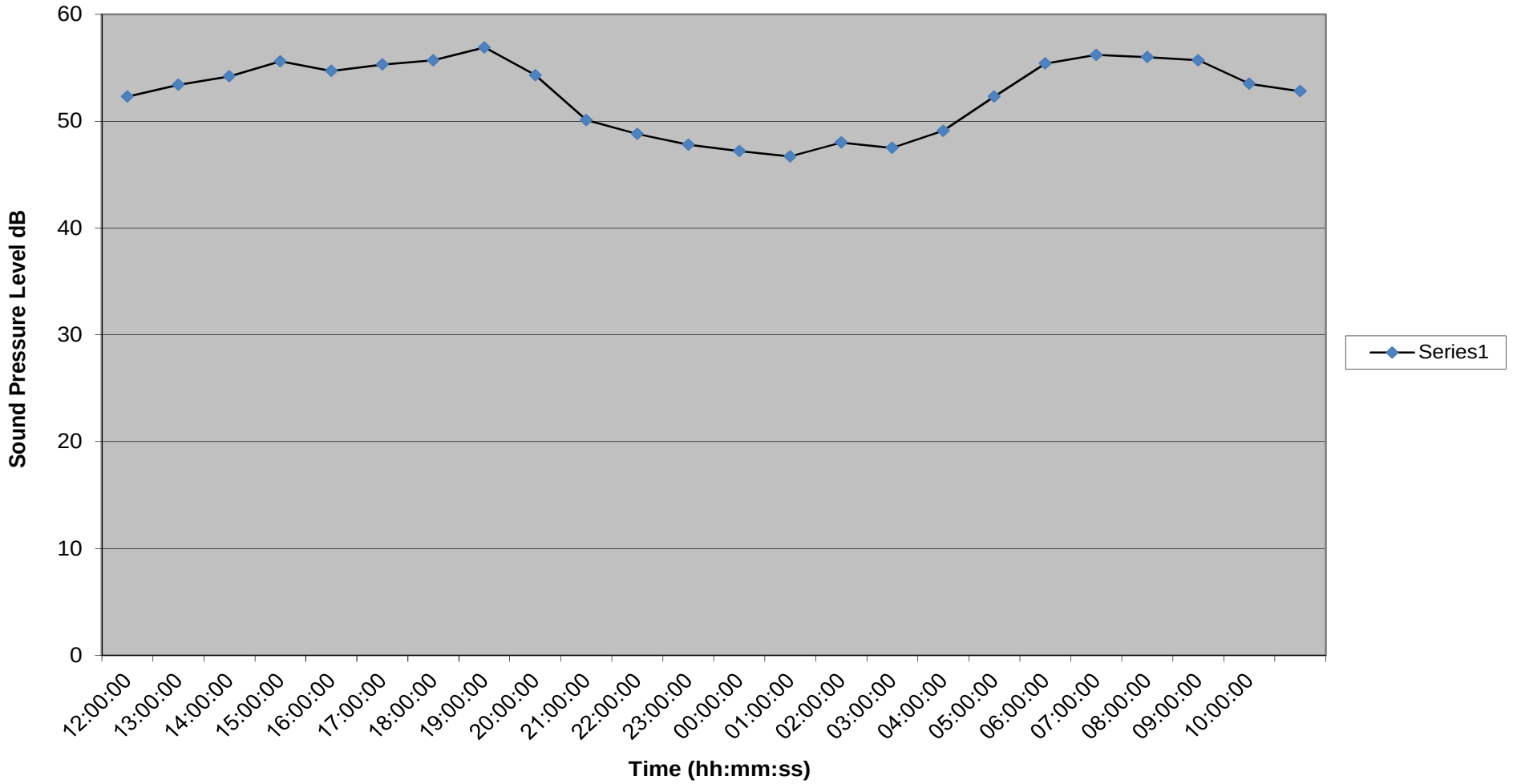
MEASUREMENT DATA

& TIME HISTOGRAMS

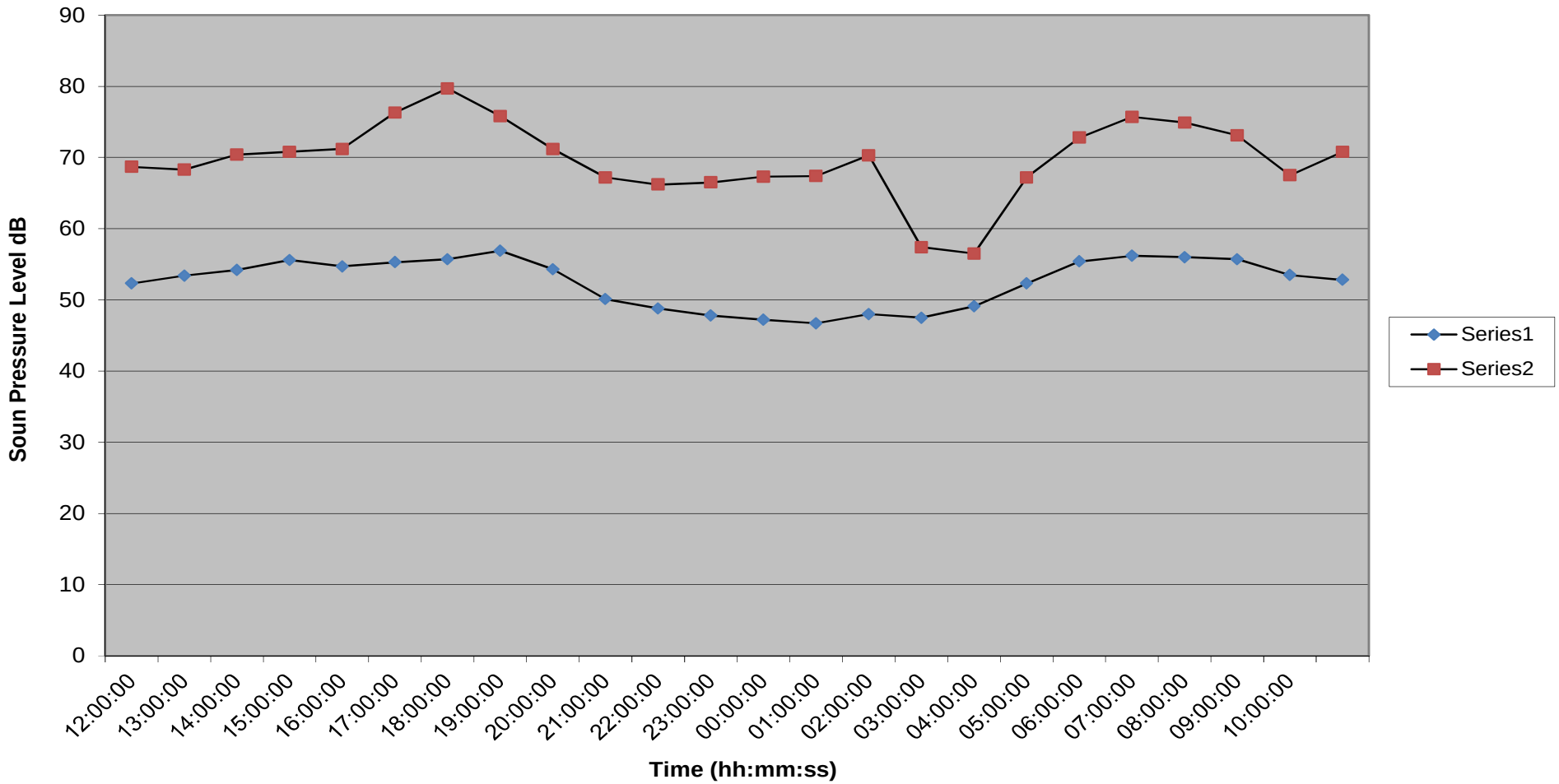
Measurement Data

Noise Survey 30-11-20 to 01-12-20	New Development at the rear of 4 Bladon Close, Oxford, OX2 8AD.		
Time	L_{Aeq} 1 hr dB(A)	L_{Amax} dB(A)	L_{A90} dB(A)
12:00:00	52.3	68.7	49
13:00:00	53.4	68.3	49.1
14:00:00	54.2	70.4	49.4
15:00:00	55.6	70.8	50.1
16:00:00	54.7	71.2	51.2
17:00:00	55.3	76.3	50.6
18:00:00	55.7	79.7	50.1
19:00:00	56.9	75.8	49.1
20:00:00	54.3	71.2	49.5
21:00:00	50.1	67.2	47.2
22:00:00	48.8	66.2	45.6
23:00:00	47.8	66.5	44.1
00:00:00	47.2	67.3	43.8
01:00:00	46.7	67.4	42.8
02:00:00	48	70.3	44.2
03:00:00	47.5	57.4	45
04:00:00	49.1	56.5	46.1
05:00:00	52.3	67.2	49.5
06:00:00	55.4	72.8	52.9
07:00:00	56.2	75.7	54.6
08:00:00	56	74.9	54.4
09:00:00	55.7	73.1	53.3
10:00:00	53.5	67.5	51.4
11:00:00	52.8	70.8	49.4

Noise Survey - 4 Bladon Close, Oxford
LAeq 1 Hour Time History
from 11:00 on 30/11/20 to11:00 on 01/12/20



Noise Survey - 4 Bladon Close, Oxford
LAeq 1 Hour & LAmax Time History
from 11:00 on 30/11/20 to 11:00 on 01/12/20



APPENDIX E

PHOTOGRAPHS

Photo of the front of the site at 4 Bladon Close, Oxford.

Photo of the front of the site at 4 Bladon Close, Oxford.

Photo taken from the front of the site, looking towards Woodstock Road.

Photo taken from the first floor window showing the railway line at the rear of the site and microphone set up on rear flat roof.

Photo taken from the first floor window showing the railway line at the rear with train passing.

END OF REPORT