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ANWYL PARTNERSHIPS LTD

DIDSBURY ROAD, HEATON MERSEY

NOISE ASSESSMENT REPORT

MARCH 2022

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NOISE ASSESSMENT REPORT

MARCH 2022

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CONTENTS

EXECUTIVE SUMMARY 1
1 INTRODUCTION 2
2 ASSESSMENT METHODOLOGY 3
2.1 Consultation and Scope of Assessment 3
3 NOISE SURVEY 4
3.1 Introduction 4
3.2 Meteorological Conditions 4
3.3 Existing Noise Levels 5
4 DETAILS OF NOISE MODELLING 6
5 NOISE ASSESSMENT 7
5.1 Assessment of the External Noise Levels 7
5.2 Assessment of Internal Noise Levels 7
5.3 Overheating Risk Assessment 7
6 NOISE ATTENUATION SCHEME 9
6.1 Outdoor Living Areas 9
6.2 Internal Living Areas - Houses 9
6.3 Internal Living Areas - Apartments 11
6.4 AVO Stage 2 Assessment 11
7 CONSTRUCTION NOISE 13
7.1 Construction Environment Management Plan 13
8 CONCLUSIONS 15

TABLES

Table 1: Noise Monitoring Periods
Table 2: Measured Noise Levels at MLs
Table 3: Predicted Rail Noise Data
Table 4: Façade Mitigation
Table 5: Façade Mitigation
Table 6: Glazing and Ventilation Specification of example products assumed in the noise calculations
Table 7: Wall and Roof Specification of example products assumed in the noise calculations
Table 8: BS4142 Assessment

APPENDICES

Appendix A Site Layout
Appendix B Noise Legislation and Guidance
Appendix C Noise Survey Results
Appendix D Level 2 Overheating Assessment
Appendix E Noise Break-in Calculation

FIGURES

Figure 1 Noise Monitoring Location
Figure 2 Daytime Noise Contours Across the Developed Site
Figure 3 Night-time Noise Contours Across the Developed Site
Figure 4 Night-time Maximum Noise Contours Across the Developed Site
Figure 5 Ground Floor Mitigation Requirements
Figure 6 First Floor Mitigation Requirements
Figure 7 Second Floor Mitigation Requirements

EXECUTIVE SUMMARY

Wardell Armstrong LLP has carried out a noise assessment to accompany a full planning application for a proposed residential development at a site off Didsbury Road, Heaton Mersey.

A noise survey has been undertaken, and the road traffic on Didsbury Road has been established as the dominant source of noise affecting the proposed development site.

External noise levels in private amenity areas will meet the upper guideline criteria across the site.

Internal noise would not adversely affect future residence, subject to the implementation of the façade mitigation measures suggested in this report.

Where mitigation is included as discussed in this assessment, noise levels in habitable areas of the site would be below the SOAEL. The proposed site design, with incorporated mitigation would meet the aims of the NPSE and comply with Paragraph 185 of the NPPF.

The effect of noise can be mitigated at this site to avoid noise giving rise to significant adverse impacts on health and quality of life. As such noise should not be a barrier to residential development at this location.

1 INTRODUCTION

1.1.1 Wardell Armstrong LLP (WA) has been commissioned by Anwyl Partnerships Ltd to undertake a noise assessment to accompany a full planning application for the proposed residential development at Didsbury Road, Heaton Mersey, Stockport.

1.1.2 The site currently comprises a school, which is no longer operating, and lies within the residential area of Heaton Moor. The A5145 runs along the northern boundary, beyond which is a residential area. The remaining boundaries of the site are also characterised by existing residential dwellings.

1.1.3 The proposed site layout is shown in **Appendix A**. The development will comprise a row of 3 story semi detached plots fronting Didsbury Road, and a single block comprising 72 one and two bedroom apartments split over four floors.

1.1.4 This report details the results of the noise assessment undertaken to accompany the full planning application for the proposed development. The report assesses the results of baseline noise monitoring and noise modelling carried out in accordance with current guidance and includes recommendations for noise mitigation where appropriate.

2 ASSESSMENT METHODOLOGY

2.1 Consultation and Scope of Assessment

2.1.1 As required, the site is assessed to the guidance in ProPG, although as this is a full application, there is limited scope to change the site layout at this stage.

2.1.2 The noise assessment will take into account current guidance including:

- National Planning Policy Framework, 2021 (NPPF).
- Planning Practice Guidance – Noise, 2019 (PPG).
- Noise Policy Statement for England 2010 (NPSE).
- British Standard 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound.
- British Standard 8233: 2014 Guidance on sound insulation and noise reduction for buildings (BS8233).
- ProPG: Planning & Noise: Professional Practice Guidance on Planning and Noise, 2017 (ProPG).
- AVO: Acoustics, Ventilation and Vibration – Residential Design Guide, 2020 (AVO).

2.1.3 Further details of these documents are included in **Appendix B**.

3 NOISE SURVEY

3.1 Introduction

3.1.1 On the 15th and 16th November 2021, WA carried out a noise survey to measure noise levels from the nearby road source, the noise monitor was on site for 24 hours. Monitoring Locations are shown on Figure 1.

3.1.2 Table 1 shows the survey periods at the Monitoring Locations, together with associated observations undertaken during the survey.

Table 1: Noise Monitoring Periods

Monitoring Location	Start	Finish	Comments
ML1	15/11/21 12:00	16/11/21 12:00	Noise measurements dominated by road traffic noise from Didsbury Road.

3.1.3 The noise measurements were made using a Class 1, integrating sound level meter. The microphone was mounted on a tripod 1.5m above the ground and more than 3.5 metres from any other reflecting surfaces with the diaphragms horizontal. The sound level meter was calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No significant drift in the calibration during the survey was noted.

3.1.4 Monitoring equipment used is as follows:

- SLM – dB01, Fusion SN:10711
- Calibrator – dB01, Cal21 SN:34254653

3.1.5 A-weighted[1] L_{eqs}[2] $L_{Amax,f}$[3] levels were measured in accordance with the requirements of BS8233. The A-weighted L_{90s}[4] was also measured to provide additional information. The measured noise levels are shown graphically in **Appendix C**.

3.2 Meteorological Conditions

3.2.1 The weather conditions during the survey were around 12°C at the start and end of the monitoring period, with lows of 9°C overnight, with a light southerly breeze <5m/s. Brief isolated showers were reported during the night, but any effect on road noise

[1] A' Weighting — An electronic filter in a sound level meter which mimics the human ear's response to sounds at different frequencies under defined conditions.

[2] L_{eqs} — Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.

[3] $L_{Amax,f}$ — The maximum sound pressure level measured, in fast time weighting during the measurement period.

[4] L_{90} — The noise level which is exceeded for 90% of the measurement period.

levels is considered to be negligible.

3.3 Existing Noise Levels

3.3.1 The measured noise values are summarised below in **Table 2**. Daytime hours are taken to be 0700 to 2300 hours and night-time to be 2300 to 0700 hours. All monitoring was undertaken to allow noise modelling of the site to be undertaken rather than directly measure noise levels on the site.

Table 2: Measured Noise Levels at MLs

Monitoring Location	Start	Duration	$L_{Aeq,T}$	$L_{Amax,f}$	$L_{A90,T}$
ML1	15/11/21 12:00	11:00	69.9	98.8	58.9
ML1	16/11/21 07:00	05:00	71.0	95.2	62.1
Daytime Average			**70.3**	**98.8**	**59.9**
ML1	15/11/21 23:00	08:00	64.2	89.0	40.1

4 DETAILS OF NOISE MODELLING

4.1.1 Noise prediction calculations have been carried out to determine the expected noise levels across the site, with the proposed dwellings in place.

4.1.2 SoundPLAN v8.2 noise modelling software has been used to calculate the noise levels across the development site, to determine the need for any mitigation measures.

4.1.3 The modelling has been carried out in accordance with ISO 9613-2:1996 Acoustics - Attenuation of sound during propagation outdoors - Part 2: General method of calculation (ISO9613). The software uses geographical information to create a model of the study area on which to generate noise contours and includes objects that affect the propagation of sound such as buildings and topography.

4.1.4 Topography information has been taken from site topographical surveys and LIDAR data provided on the DEFRA[5] website, with a resolution of 1.0m. Final site levels are taken from plans provided by the wider project team.

4.1.5 The noise model has been checked for accuracy against the measured noise levels. This has been carried out by co-locating receptor locations in the model with the monitoring locations.

4.1.6 The calibration of individual noise sources is done to ±0dB so that the noise model is accurate when considering noise at the development site. Therefore, the results of the model have been used to inform the noise impact assessment and mitigation requirements.

[5] https://environment.data.gov.uk/DefraDataDownload/?Mode=survey

5 NOISE ASSESSMENT

5.1 Assessment of the External Noise Levels

5.1.1 The noise contour plot, shown in Figure 2, identifies the daytime $L_{Aeq,16hour}$ noise levels affecting the site in outdoor amenity areas. The drawing indicates that most of the plots, including the rooftop garden areas on the apartment building will not exceed 50dB $L_{Aeq,16hour}$. Some small parts of the gardens associated with plots closest to the road will be between 50 and 55dB $L_{Aeq,16hour}$, however are not expected to exceed the upper criteria of 55dB $L_{Aeq,16hour}$ stated in BS8233.

5.1.2 Garden fences are assumed to be 1.8m in height and the construction should be appropriate to mitigate noise as follows:

- No gaps beneath or between fence panels, with construction and materials chosen so that gaps do not develop over time through warping;
- Surface mass of at least 12kg/m^2, which should be maintained throughout the lifetime of the fence.

5.2 Assessment of Internal Noise Levels

5.2.1 In accordance with BS8233, the daytime noise guideline value within living rooms and bedrooms is 35dB $L_{Aeq,16hour}$, and the night time noise guideline values in bedrooms are 30 dB $L_{Aeq,16hour}$ and 45 dB $L_{Amax,f}$.

5.2.2 Predicted noise levels at the facades on the Application Site will range between 66.1dB and 32.0dB $L_{Aeq,t}$ during the day and 60.1dB and 26.4dB $L_{Aeq,t}$ at night. $L_{Amax,f}$ events are predicted to be up to 78.1dB $L_{Amax,f}$ at night. Figure 3 ($L_{Aeq,8hour}$) and Figure 4 ($L_{Amax,f}$) shows the predicted noise levels across the site at night.

5.2.3 A typical open window in a residential façade would be expected to provide approximately 13dB of attenuation, therefore it would not be possible to achieve internal noise criteria from BS8233 using an open window for ventilation at all facades.

5.3 Overheating Risk Assessment

5.3.1 In accordance with the AVO guide, an Overheating Risk Assessment (ORA) has been carried out. The ORA assesses initial risk of overheating, caused by the need to mitigate against noise by closing windows, based on the noise levels at the development site.

5.3.2 The daytime ($L_{Aeq,16hr}$) and night-time ($L_{Aeq,8hr}$) noise levels, predicted at representative

locations of dwellings closest to the Didsbury Road, have been compared to the information provided in Table 3-2 of AVO. The results are shown in Table 3.

Table 3: Stage 1 Overheating Risk Assessment

Risk Assessment Location	Average Daytime Noise Level (dB $L_{Aeq,16hr}$)	Daytime Risk of Overheating	Average Night-time Noise Level (dB $L_{Aeq,8hr}$)	Night-time Risk of Adverse Effect
Northern Boundary	66	High	60	High

5.3.3 **Error! Reference source not found.** indicates that during the daytime and night-time periods, proposed receptors located in the northern parts of the development, adjacent to Didsbury Road have up to a high risk of experiencing overheating due to the ambient noise levels over the site. As such a Level 2 overheating assessment of noise from transportation sources will be undertaken (see Section 6.4).

5.3.4 Away from the site boundaries, it is likely that, through a mixture of good acoustic design and distance attenuation, site noise levels will be reduced so that open windows can be used as a primary means of mitigating overheating and this will not lead to adverse effects of noise internally.

5.3.5 The ORA shows that good acoustic design will be required for proposed receptors adjacent to Didsbury Road, to ensure that the risk of overheating is minimised and that internal noise guideline levels are achieved.

5.3.6 In accordance with AVO a Stage 2 overheating assessment is required to establish the level of overheating risk and to ensure future residents are protected from noise ingress. The Stage 2 assessment is detailed in Section 6.4 below and shown in **Appendix D**.

5.3.7 We would recommend that advice is taken from an M&E specialist to ensure the right amount of air changes are achieved in the dwelling and that overheating conditions are avoided.

6 NOISE ATTENUATION SCHEME

6.1 Outdoor Living Areas

6.1.1 All plot boundary fencing around the edge of the site, i.e. not those separating individual gardens, should be at least 1.8m in height.

6.1.2 The construction of the fences should be appropriate to mitigate noise as follows:

- No gaps beneath or between fence panels, with construction and materials chosen so that gaps do not develop over time through warping;
- Surface mass of at least 12kg/m^2, which should be maintained throughout the lifetime of the fence.

6.2 Internal Living Areas - Houses

6.2.1 When assessing noise levels in noise sensitive rooms, such as living rooms and bedrooms, the noise attenuation provided by the overall building façade should be considered. The façade noise levels from the model have been considered and appropriate glazing and an alternative means of ventilation, to that of an open window, have been specified to meet the internal noise criteria.

6.2.2 Glazing and trickle vents are the building elements that provide the least noise attenuation. Detailed noise break-in calculations have been undertaken to consider these building elements of noise sensitive rooms (i.e. living rooms and bedrooms) across the development.

6.2.3 The break-in calculations are based on the predicted noise levels at the proposed dwelling façades and the worst-case ratio of room volume to glazing surface. An example of the break-in calculations for the worst case room is included in **Appendix E.**

6.2.4 Considering the layout of the site, the worst affected facades are those on the houses to the north of the development, facing onto Didsbury Road. The majority of the facades on the 4 story apartment block will be able to achieve noise guideline levels with window open for ventilation. Whilst an open window can be used for ventilation, it is assumed that the façade will still retain typical features of noise mitigation as described in Table 4 below.

6.2.5 Figures 5 (Ground Floor), 6 (First Floor), 7 (Second Floor), show the facades which require mitigation in order to meet internal noise guideline levels for ground floor and first floor noise sensitive rooms. The mitigation scheme is provided in Table 4 below.

It is recommended that all plots be provided with mitigation to allow windows to be closed when required and still achieve appropriate ventilation requirements. In some areas, enhanced mitigation will be required.

Table 4: Façade Mitigation

Colour	Mitigation Type	Glazing	Ventilation
Green	A	4/12/4 glazing	Via Open Window
Yellow	B	4/12/4 glazing	Greenwood 2500EAW.AC1
Red	C	6/12/6 glazing	Greenwood 2500EAW.AC1

6.2.6 Other products or specifications may be suitable, however it is recommended that the acoustic performance of the glazing and ventilation meets the minimum specifications used in the calculations detailed in **Appendix D**, also reproduced in Table 5 below, for each octave band between 63Hz and 8kHz.

Table 5: Glazing and Ventilation Specification of example products assumed in the noise calculations

Product	Noise Attenuation (dB)								
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz	$R_w/D_{ne,w}$+Ctr
Greenwood 2500EAW.AC1	30	42	40	36	48	53	56	56	39
Glazing 4/12/4	18	24	20	25	23	29	35	35	26
Glazing 6/12/6	14	20	19	29	33	39	45	45	31

6.2.7 The calculations for mitigation in houses assume a wall and roof build up as shown in Table 6.

Table 6: Wall and Roof Specification of example products assumed in the noise calculations for houses

Product	Noise Attenuation (dB)							
	63Hz	125Hz	250Hz	500Hz	1kHz	2kHz	4kHz	8kHz
Wall Two leaves of 102.5mm brickwork, 50mm cavity, rigid wall ties	31	37	42	52	60	63	68	68
Roof / Ceiling Tiled/slate roof, 12 mm plasterboard ceiling, 100 mm mineral wool insulation	18	24	34	40	45	49	49	49

6.2.8 It is recommended that any acoustic ventilation proposed at the site should, as a minimum, comply with Building Regulations 2000 Approved Document F Means of Ventilation and British Standard BS5925 1991: “Code of Practice for Ventilation Principles and Designing for Natural Ventilation”.

6.2.9 The implementation of the recommended glazing together with appropriate acoustic ventilators would ensure that the required internal daytime and night-time noise levels are achieved.

6.3 Internal Living Areas - Apartments

6.3.1 The apartment block in the proposals is set back from the road noise source and is further down the embankment than the houses fronting the road. As such the block is well protected from road noise sources.

6.3.2 Some facades are predicted to experience a façade level which would require windows to be closed. The exceedances are marginal, <5dB, and therefore it is considered that typical mitigation as detailed in Tables 4 above would be appropriate. The facades are:

- Western 4 story block, Western Façade, 3rd and 4th story
- Western 4 story block, Eastern Façade, 3rd and 4th story
- Western 3 story block, Northern Façade, 3rd Story
- Eastern 4 story block, Northern Façade, 3rd and 4th story
- Eastern 4 Story Block, Western Façade, 3rd and 4th story

6.3.3 In order to standardise the faced construction, it would be appropriate to apply the same mitigation to all sensitive façades, i.e. 4/12/4 glazing with associated Greenwood 2500EAW.AC1 trickle ventilation unit.

6.4 AVO Stage 2 Assessment

6.4.1 AVO suggests the significance of the effect on human health depends on the frequency of overheating and the internal ambient noise level. Where the noise level is high but there is a low risk of overheating, the effect on human health is low. However, where there is an increased risk of overheating, the potential for significant observed adverse effect on human health increases. This is illustrated on Figure 3-3 of the AVO guidance.

6.4.2 The results of the Stage 1 overheating assessment indicate that the site will be subject to a 'High' risk of an overheating condition occurring.

6.4.3 Those receptors that do not face Didsbury Road or are otherwise screened by the development itself, will have a negligible risk of overheating as windows are not required to be closed to mitigate noise, therefore, do not need to be considered

further.

6.4.4 However, the risk of overheating should be considered for proposed dwellings that face Didsbury Road. An assessment has therefore been carried out in accordance with AVO and can be seen in full in Appendix C. The Stage 2 Assessment has found that mitigation will be required for the houses facing onto the road noise sources.

6.4.5 Façade mitigation for the houses is described in Section 6 above and should be considered for all plots identified in the attached figures. The mitigation includes the use of trickle ventilation in place of an open window. Further advice should be sought from thermal and/or mechanical services engineering, as required to determine how the ventilation scheme will protect against overheating and comply with criteria in Approved Document F of the Building Regulations.

7 CONSTRUCTION NOISE

7.1 Construction Environment Management Plan

7.1.1 At this stage, details on the construction equipment and methodology are not available. Noise levels at surrounding residential receptors are likely to be below 65dB(A) when rounded to the nearest 5dB and as such daytime construction noise levels should be mitigated to below 65dB between 0700 and 1900.

7.1.2 A Noise and Vibration Management Plan will be required as part of the wider CEMP. This will lay out all the available mitigation measures to be used during the construction phase.

7.1.3 Specific mitigation measures will be determined once construction methodologies are identified. The following are examples of generic mitigation techniques which should be employed on all construction sites in close proximity to residential receptors:

- Working hours should be identified at the outset and not extended. Typically, these will be 0700 – 1900 Monday to Friday, 0700 – 1300 Saturday.
- Where working outside of these times, permission should be sought from the LPA.
- All plant and equipment should be in good working order, well maintained and frequently inspected for irregular noise or vibration.
- Appropriate plant should be chosen for each task to ensure the work is done in a timely manner without excessive noise or vibration being emitted.
- Warning alarms should be broadband where possible to avoid tonal emissions.
- Notices and toolbox talks should be used to train and educate staff on the importance of noise and vibration control on site
- Site cabins or other structures should be used as a noise barrier where possible.
- Where activities with excessive noise or vibration levels, such as piling are required, specific screening should be utilised to reduce noise emissions from the site. Activity times should be chosen to reduce the number of events per day and ensure they are done at the least sensitive times.
- Site notification should identify a contact for residents to raise issues directly with construction management before issues are escalated to the LPA. This is often achieved through a mail drop to the surrounding area in advance of works. Good communication with stakeholders and 3rd parties at the outset can help to avoid issues at a later date.

- If noise or vibration levels are being exceeded, a scheme of noise or vibration monitoring may be required and should be undertaken in collaboration with the LPA, with results recorded.
- A register of complaints should be kept, alongside a record of and actions taken to undertaken specific mitigation.

8 CONCLUSIONS

8.1.1 Wardell Armstrong has carried out a noise assessment to accompany a full planning application for a site at Didsbury Road, Heaton Mersey, Stockport.

8.1.2 In policy terms there is no presumption against development in places with high noise levels, provided that the noise can be adequately mitigated taking into account the economic and social benefits of the proposed scheme.

8.1.3 The noise source which will potentially affect the residents of the proposed residential development is the Didsbury Road, which runs to the north of the site.

8.1.4 In outdoor living areas, the 55 dB $L_{Aeq,16hour}$ upper noise guideline level will be met, with the majority of plots and communal outdoor areas expecting noise levels below 50dB $L_{Aeq,16hour}$.

8.1.5 For internal living areas, the majority of dwellings will meet noise guideline levels with either open windows or standard glazing and an alternative means of ventilation. For bedrooms facing directly onto Didsbury Road, a scheme of enhanced glazing and ventilation is recommended.

8.1.6 It is considered that residential development of the type proposed is appropriate for the site and that noise should not be a constraint for the development.

8.1.7 Where mitigation is included as discussed in this assessment, noise levels in habitable areas of the site would be below the SOAEL. The proposed site design, with incorporated mitigation would meet the aims of the NPSE and comply with Paragraph 185 of the NPPF.

8.1.8 The effect of noise can be mitigated at this site to avoid noise giving rise to significant adverse impacts on health and quality of life. As such noise should not be a barrier to residential development at this location.

Appendix A
Site Layout

1 **Site_Plan_Proposed**
Scale: 1 : 250

0m 5m 10m 15m 20m A1

VISUAL SCALE 1:250 @ A1

This drawing must be printed in colour to be read correctly

Notes

Figured dimensions are to be used in all case.
Dimensions should not be scaled from drawing
All existing dimensions should be checked on site before commencement of the work.
Any discrepancies in dimensions should be clarified with the Architect prior to commencement of the work.
No deviation from this drawing will be permitted without the prior written consent of the Architect.
This drawing is to be read in conjunction with all the relevant Mechanical and Electrical drawings.
This drawing is to be read in conjunction with the relevant Structural Engineer's drawings, structural calculations and recommendations.
This drawing is to be read in conjunction with the relevant Fire Safety Strategy drawings

This drawing must be read in conjunction with LMA drawing 7500_Strategy_DesignersRiskAssessment which indicates all current and active designers risks that have been identified by Lovelock Mitchell Architects in accordance with the CDM Regulations 2015.

7002_Schedule_Numbered_Annotation

Reference	Description
Boundary Treatment	
BT1	New Facing Brick Wall: Red Multi: Private Access Via Individual Pedestrian Gates
BT2	New Landscape Buffer Along Southern Boundary: Refer to Landscape Strategy
Proposed Buildings	
B1.0	Semi-detached House: 4B7P Pair
B2.0	Apartment Building: 3 Storey Element: Non-accessible Sedum Roof
B2.1	Apartment Building: Main Entrance At Level 03
B2.2	Apartment Building: 4 Storey Element: Non-accessible Flat Roof
B2.3	Apartment Building: 3 Storey Element: Accessible Roof Terrace - Refer To GA Plans
B3.0	External Secure Bin Store
Site Feature	
SF1	Site Entrance Juction: Visibility Splay 2.4m x 40m
SF2	Private Gardens
SF3	Apartment Parking: 9no.
SF4	Retaining Wall: Timber Crib Lock (Subject to further design & agreement with LA post planning)
SF5	Seating Area
SF6	Vehicle Turning Head
SF7	Apartment Parking: 28no.
SF8	Main Apartment Entrance: Level 0
SF9	Secure Bin Storage
SF10	New Access (Road & street lighting subject to further agreement with local LA post planning)
SF11	Landscaping: Refer to Landscape Strategy

Rev.	Revision description	Drawn	Checked	Date
P1	Planning issue	CW	MR	12-11-21

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Project
Proposed Residential Development
Didsbury Road, Heaton Mersey

Title
Site_Plan_Proposed

LMA Project	Drawing number							Rev.
	Project	Originator	Zone	Level	Type	Role	Drawing/Number	
1837	AHM	LMA	00	XX	DR	A	7002	P1

D:\Autodesk\Revit Local\AHM-LMA-00-XX-M3-A-0001_SiteModel_chris.webster\N8SXT.rvt

Appendix B
Noise Legislation and Guidance

Appendix B Noise Legislation and Guidance

National Planning Policy Framework

In February 2021 the 'National Planning Policy Framework' (NPPF) was amended as the current planning policy guidance within England.

Paragraph 185 of the NPPF states:

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

a. *Mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development - and avoid noise giving rise to significant adverse impact on health and the quality of life;*

b. *Identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'…*

Paragraph 187 of the NPPF states:

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

Noise Policy Statement for England

With regard to 'significant adverse impacts on health and the quality of life' the NPPF refers to the 'Noise Policy Statement for England' (NPSE).

The Noise Policy Statement for England refers to the World Health Organisation when discussing noise impacts and introduces observed effect levels which are based on established concepts from toxicology that are applied to noise impacts by WHO.

Three levels are defined as follows:

'NOEL – No Observed Effect Level

- *This is the level 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 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'.*

The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided. The second aim refers to the situation where the impact lies somewhere between LOAEL and SOAEL, and it requires that all reasonable steps are taken to mitigate and minimise the adverse effects of noise. However, this does not mean that such adverse effects cannot occur.

Planning Practice Guidance – Noise

The Planning Practice Guidance (PPG) provides further detail about how the effect levels can be recognised. Above the NOEL noise becomes noticeable, however it has no adverse effect as it does not cause any change in behaviour or attitude. Once noise crosses the LOAEL threshold it begins to have an adverse effect and consideration needs to be given to mitigating and minimising those effects, taking account of the economic and social benefits being derived from the activity causing the noise. Increasing noise exposure further might cause the SOAEL threshold to be crossed. If the exposure is above this level the planning process should be used to avoid the effect occurring by use of appropriate mitigation such as by altering the design and layout. Such decisions must be made taking account of the economic and social benefit of the activity causing the noise, but it is undesirable for such exposure to be caused. At the highest extreme the situation should be prevented from occurring regardless of the benefits which might arise. Table 1 summarises the noise exposure hierarchy.

Table 1 - National Planning Practice Guidance 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

Table 1 - National Planning Practice Guidance noise exposure hierarchy			
Perception	**Examples of Outcomes**	**Increasing Effect Level**	**Action**
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; where there is no alternative ventilation, having to close 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. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening 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 Adverse Effect	Prevent

The PPG summarises the approach to be taken when assessing noise. It accepts that noise can override other planning concerns, but states:

"Neither the Noise Policy Statement for England nor the National Planning Policy Framework (which reflects the Noise Policy Statement) expects noise to be considered in isolation, separate from the economic, social and other environmental dimensions of proposed development"

ProPG: Planning & Noise Professional Practice Guidance on Planning & Noise

ProPG Planning and Noise, provides professional practice guidance in relation to new residential developments, exposed to noise from transport sources. It provides practitioners

with a recommended approach to the management of noise within the planning system in England.

The guidance reflects the Government's overarching National Planning Policy Framework, the Noise Policy Statement for England, and Planning Practice Guidance (including PPG-Noise) and draws on other authoritative sources of guidance. It provides advice for Local Planning Authorities and developers, and their professional advisors, on achieving good acoustic design in and around new residential developments.

British Standard 8233:2014 Guidance on sound insulation and noise reduction for buildings

British Standard 8233 "Guidance on sound insulation and noise reduction for buildings" 2014, suggests the following guideline noise levels and states that they are based on guidelines issued by the World Health Organisation;

- 35 dB $L_{Aeq\ (16\ hour)}$ during the day time in noise sensitive rooms
- 30 dB $L_{Aeq\ (8\ hour)}$ during the night time in bedrooms
- 45 dB $L_{Amax,F}$ during the night time in bedrooms
- 50 dB $L_{Aeq\ (16\ hour)}$ desirable external noise levels for amenity space such as gardens and patios
- 55 dB $L_{Aeq\ (16\ hour)}$ upper guideline value which would be acceptable in noisier environments.

In addition, for internal noise levels it states;

"*Where development is considered necessary or desirable, despite external noise levels above WHO guidelines, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved*."

Furthermore, with regard to external noise, the Standard states;

"*However, it is also recognised that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise 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*".

British Standard 4142:2014+A1:2019 (BS4142), Method for rating and assessing industrial and commercial sound:

BS4142 is used to rate and assess sound of an industrial and/or commercial nature including:

- sound from industrial and manufacturing processes;
- sound from fixed installations which comprise mechanical and electrical plant and equipment;
- sound from the loading and unloading of goods and materials at industrial and/or commercial premises; and
- sound from mobile plant and vehicles that is an intrinsic part of the overall sound emanating from premises or processes, such as that from forklift trucks, or that from train or ship movements on or around an industrial and/or commercial site.

The standard is applicable to the determination of the following levels at outdoor locations:

- rating levels for sources of sound of an industrial and/or commercial nature; and
- ambient, background and residual sound levels, for the purposes of:

  1) Investigating complaints;

  2) Assessing sound from proposed, new, modified or additional source(s) of sound of an industrial and/or commercial nature; and

  3) Assessing sound at proposed new dwellings or premises used for residential purposes.

The purpose of the BS4142 assessment procedure is to assess the significance of sound of an industrial and/or commercial nature.

BS4142 refers to noise from the industrial source as the 'specific noise' and this is the term used in this report to refer to noise which is predicted to occur due to activities associated with Ridgewood Industrial Park. The 'specific noise' levels, of the existing industrial premises that have been measured are detailed in Section 4 of this report.

BS4142 assesses the significance of impacts by comparing the specific noise level to the background noise level (LA90). Section 4 provides details of the background noise survey undertaken.

Certain acoustic features can increase the significance of impacts over that expected from a simple comparison between the specific noise level and the background noise level. In particular BS4142 identifies that the absolute level of sound, the character, and the residual

sound and the sensitivity of receptor should all be taken into consideration. BS4142 includes allowances for a rating penalty to be added if it is found that the specific noise source contains a tone, impulse and/or other characteristic, or is expected to be present. The specific noise level along with any applicable correction is referred to as the 'rating level'.

The greater the increase between the rating level over the background noise level, the greater the magnitude of the impact. The assessment criteria given by BS4142 are as follows:

- A difference of around +10dB or more is likely to be an indication of a significant adverse impact, depending on the context.
- A difference of around +5dB is likely to be an indication of an adverse impact, depending on the context.
- The lower the rating level is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

During the daytime, BS4142 requires that noise levels are assessed over 1-hour periods. However, during the night-time, noise levels are required to be assessed over 15-minute periods.

Where the initial estimate of the impact needs to be modified due to context, BS4142 states that all pertinent factors should be taken into consideration, including:

- The absolute level of sound;
- The character and level of the residual sound compared to the character and level of the specific sound; and
- The sensitivity of the receptor and whether dwellings or other premises used for residential purposes will already incorporate design measures that secure good internal and/or outdoor acoustic conditions.

AVO: Acoustics, Ventilation and Overheating Residential Design Guide

The AVO guide recommends an approach to acoustic assessments for residential development that takes into consideration the interdependence of provisions for acoustics, ventilation and overheating.

The application of the AVO Guide is intended to demonstrate good acoustic design in

accordance with ProPG. A two-stage assessment approach is advised as:

- Stage 1 – Site Risk Assessment
- Stage 2 – Detailed assessment of Adverse Effect

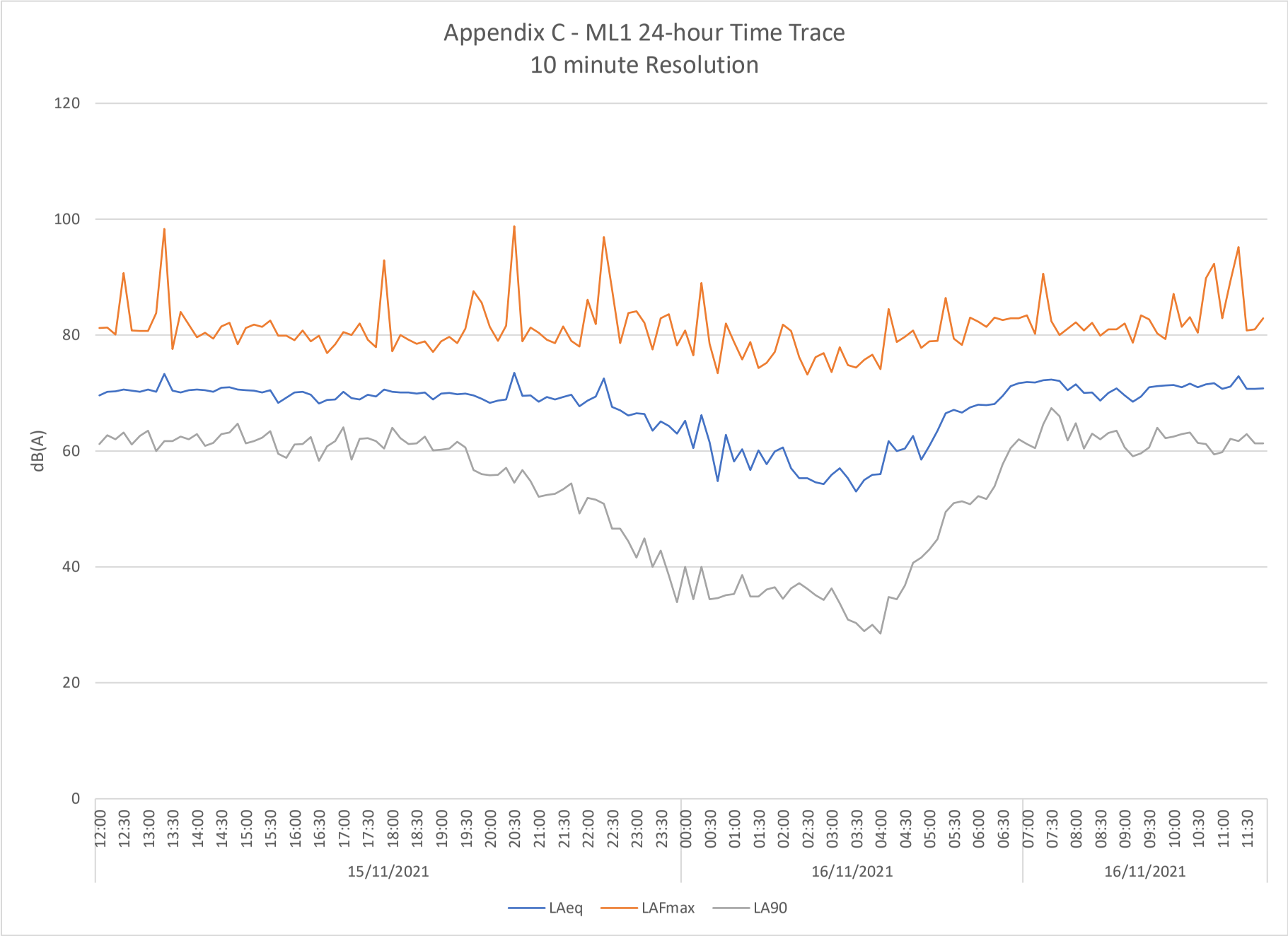
The guide provides a means of assessment to satisfy the need to consider acoustics, ventilation and overheating at the planning stage. It also assists in educating clients, environmental health officers, planning officers and other stakeholders of the interdependence of design for acoustics, ventilation and overheating.

Department of Transport's memorandum, "Calculation of Railway Noise" (CRN), 1995

The assessment methodology in the Calculation of Railway Noise (CRN) provides the guidance for noise predictions of railway noise.

The CRN procedure incorporates the type of train and frequency of trains operating over a particular section of track, to determine the overall LAeq for both daytime and night-time periods.

Appendix C
Noise Survey Results


Appendix C - ML1 24-hour Time Trace
10 minute Resolution
dB(A)
120
100
80
60
40
20
0
12:00
12:30
13:00
13:30
14:00
14:30
15:00
15:30
16:00
16:30
17:00
17:30
18:00
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07:00
07:30
08:00
08:30
09:00
09:30
10:00
10:30
11:00
11:30
15/11/2021
16/11/2021
16/11/2021
LAeq
LAFmax
LA90

Appendix D
AVO Assessment

APPENDIX D – Stage 2 Overheating Assessment

D.1 This appendix describes the steps carried out in Stage 2 of the overheating assessment, as carried out in line with the AVO guidance.

D.2 A Stage 1 assessment, has been carried out to assess the potential risk of overheating, caused by transportation noise at proposed dwellings across the site. This has shown that in the northern of the site, the risk of overheating is High during the daytime and night-time. Away from the identified noise source, Didsbury Road, the risk will be lower.

Degree of Noise Impact

D.3 BS8233 states that where the development is considered necessary or desirable, the internal targets may be relaxed by up to 5dB and reasonable internal conditions still achieved.

D.4 The noise risk assessment carried out in line with ProPG shows that proposed dwellings located adjacent to Didsbury Road are at a high risk of adverse effect due to noise. With the windows open for ventilation, the internal noise levels are likely to exceed the relaxed criteria.

D.5 This therefore increases the risk for significant adverse observed effect level for some parts of the development.

Frequency of Overheating

D.6 The proposed development is located in Stockport, Greater Manchester. Areas here are not traditionally exposed to high temperatures and dry climates. The development is located on the edge of a city area and is at moderate risk of experiencing the urban heat island effect.

D.7 The areas of the development with a high risk of overheating comprise singular residential dwellings as opposed to multi-storey apartment blocks. The potential for frequent internal build-up of heat is therefore low.

EARLY STAGE OVERHEATING RISK TOOL

Version 1.0, July 2019

This tool provides guidance on how to assess overheating risk in residential schemes at the early stages of design. It is specifically a pre-detail design assessment intended to help identify factors that could contribute to or mitigate the likelihood of overheating.

The questions can be answered for an overall scheme or for individual units. Score zero wherever the question does not apply. Additional information is provided in the accompanying guidance, with examples of scoring and advice on next steps.

Find out more information and download accompanying guidance at goodhomes.org.uk/overheating-in-new-homes.

Good Homes Alliance

KEY FACTORS INCREASING THE LIKELIHOOD OF OVERHEATING | **KEY FACTORS REDUCING THE LIKELIHOOD OF OVERHEATING**

Geographical and local context

#1 Where is the scheme in the UK? See guidance for map	South east	4	0
	Northern England, Scotland & NI	0	
	Rest of England and Wales	2	
#2 Is the site likely to see an Urban Heat Island effect? See guidance for details	Central London (see guidance)	3	1
	Grtr London, Manchester, B'ham	2	
	Other cities, towns & dense sub-urban areas	1	

#8 Do the site surroundings feature significant blue/green infrastructure? Proximity to green spaces and large water bodies has beneficial effects on local temperatures; as guidance, this would require at least 50% of surroundings within a 100m radius to be blue/green, or a rural context	1	1

Site characteristics

#3 Does the site have barriers to windows opening? - Noise/Acoustic risks - Poor air quality/smells e.g. near factory or car park or very busy road - Security risks/crime - Adjacent to heat rejection plant	**Day** - reasons to keep all windows closed	8	4
	Day - barriers some of the time, or for some windows e.g. on quiet side	4	
	Night - reasons to keep all windows closed	8	8
	Night - bedroom windows OK to open, but other windows are likely to stay closed	4	

#9 Are immediate surrounding surfaces in majority pale in colour, or blue/green? Lighter surfaces reflect more heat and absorb less so their temperatures remain lower; consider horizontal and vertical surfaces within 10m of the scheme	1	1
#10 Does the site have existing tall trees or buildings that will shade solar-exposed glazed areas? Shading onto east, south and west facing areas can reduce solar gains, but may also reduce daylight levels	1	0

Scheme characteristics and dwelling design

#4 Are the dwellings flats? Flats often combine a number of factors contributing to overheating risk e.g. dwelling size, heat gains from surrounding areas; other dense and enclosed dwellings may be similarly affected - see guidance for examples	3	0
#5 Does the scheme have community heating? i.e. with hot pipework operating during summer, especially in internal areas, leading to heat gains and higher temperatures	3	0

#11 Do dwellings have high exposed thermal mass AND a means for secure and quiet night ventilation? Thermal mass can help slow down temperature rises, but it can also cause properties to be slower to cool, so needs to be used with care - see guidance		1	1
#12 Do floor-to-ceiling heights allow ceiling fans, now or in the future? Higher ceilings increase stratification and air movement, and offer the potential for ceiling fans	>2.8m and fan installed	2	0
	> 2.8m	1	

Solar heat gains and ventilation

#6 What is the estimated average glazing ratio for the dwellings? (as a proportion of the facade on solar-exposed areas i.e. orientations facing east, south, west, and anything in between). Higher proportions of glazing allow higher heat gains into the space	>65%	12	0
	>50%	7	
	>35%	4	
#7 Are the dwellings single aspect? Single aspect dwellings have all openings on the same facade. This reduces the potential for ventilation	Single-aspect	3	0
	Dual aspect	0	

#13 Is there useful external shading? Shading should apply to solar exposed (E/S/W) glazing. It may include shading devices, balconies above, facade articulation etc. See guidance on "full" and "part". Scoring depends on glazing proportions as per **#6**

	Full	Part	
>65%	6	3	0
>50%	4	2	
>35%	2	1	

#14 Do windows & openings support effective ventilation? Larger, effective and secure openings will help dissipate heat - see guidance

	Openings compared to Part F purge rates			
	= Part F	+50%	+100%	
Single-aspect	minimum required	3	4	0
Dual aspect		2	3	

TOTAL SCORE **10** = Sum of contributing factors: **13** *minus* Sum of mitigating factors: **3**

High — 12 — Medium — 8 — Low

score >12:
Incorporate design changes to reduce risk factors and increase mitigation factors
AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score between 8 and 12:
Seek design changes to reduce risk factors and/or increase mitigation factors
AND Carry out a detailed assessment (e.g. dynamic modelling against CIBSE TM59)

score <8:
Ensure the mitigating measures are retained, and that risk factors do not increase (e.g. in planning conditions)

PSR1 - Proposed Dwellings at the Northern Site Boundary

	External free-field noise level (dB)	Level 1 Risk Assessment (AVO Table 3-2)	Calculated Internal Noise Levels with open windows (-13dB)	Good Homes Alliance Tool Value
Daytime LAeq,16hr	66	High	53	10
Night-time LAeq,8hr	60	High	47	
Night-time LAFmax	78	High Does not Exceed 78dB	65	

Notes on Overheating Mitigation and Requirements for Level 2 Assessment

Northern Elevations - Living Rooms and Bedrooms

The Stage 1 overheating assessment indicates that the proposed development is at a High risk of overheating during the daytime and night-time , with LAmax events regularly approaching 78dB

The anticipated internal noise levels, in bedrooms with a partially open window (13dB attenuation), located on the facades closest to and facing Didsbury Road, would be 53dB during the daytime, 47dB during the night-time, with the maximum level not normally being exceeded more than 10 times per night being 65dB. These levels are above the SOAEL level, and above a level at which noise can cause a material change in behaviour They are therefore considered unsuitable for occupants and alternative methods of mitigation overheating will be necessary.

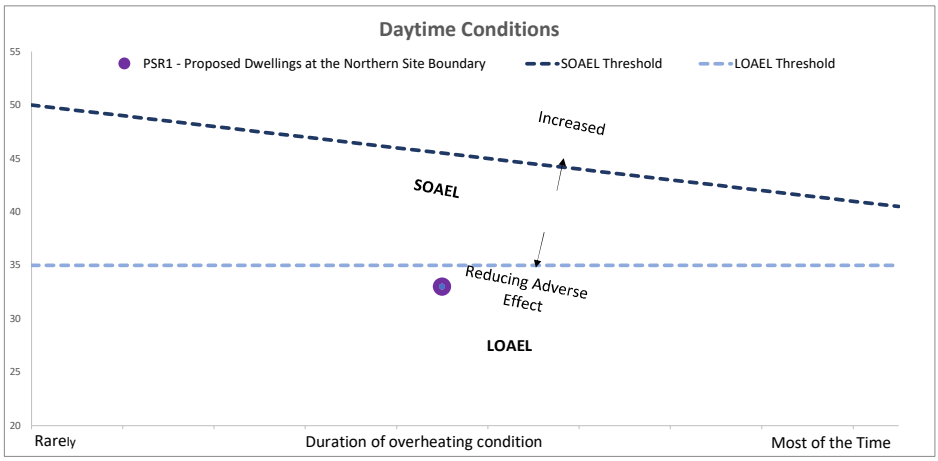
Standard opening windows are not considered to be suitable for facades facing Didsbury Road due to the high overheating risk and the likely need to have windows open for ventilation, which would cause an unacceptable noise impact if occurring for long periods.

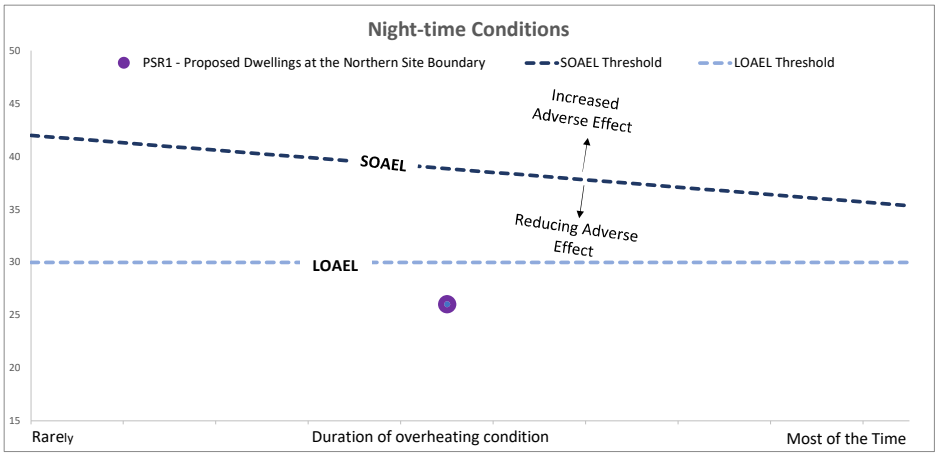
Façade mitigation for the identified plots close facing onto Didsbury Road have been undertaken with reference to the designed room sizes and gazing areas. The predicted internal noise levels for the worst case bedroom on the northern façade are shown below. It has been assumed that windows will remain openable, however, an alternative form of cooling will be provided, such as mechanical cooling or boost fans, to manage thermal comfort as part of the ventilation system. This mitigation strategy has been considered on the AVO diagrams below, these levels are below the SOAEL level for the daytime and night-time. We would recommend that advice is taken from an M&E specialist to ensure the right amount of air changes are achieved in the dwelling and that overheating conditions are avoided.

Approximate Internal Noise Levels Including Mitigation (Assumed 35dB Façade Mitigation)	Daytime LAeq,16hr	Night-time LAeq,8hr	Night-time LAFmax
	33	26	44

Level 2 Assessment (in line with Table 3-3, with mitigation)

Noise can be heard, but does not cause any change in behaviour with windows closed. This is below the LOAEL during the daytime and night-time.





Appendix E
Break In Calculation

Octave Band Composite SRI Break In Calculations

Project:	Heaton Mersey	Surface Area Wall	4.8		
Plot:	Houses	Surface Area Glazing	3.0		
Floor Level:	Floor 1	Roof Area	0.0	**Corrections**	
Room Type:	Bedroom 2	Number of vents	2	Distance	0.0
Description:	Night	Room Volume	37.9	Screening	0.0
		Room RT	0.5		

	Ref	Description
Wall	1	Two leaves of 102.5mm brickwork, 50mm cavity,rigid wall ties
Glazing	12	6/12/6
Vent	21	Greenwood 2500EAW.AC1
Roof	5	Tiled, 12mm plasterboard, 100mm mineral wool insulation
Source type	3	Reverberant field

Frequency (Hz)	***32***	***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***
Average Noise Level (dBz)	61.2	61.2	53.6	52.0	50.5	56.5	54.4	49.4	41.6
Maximum Noise Level (dBz)	35.8	53.3	57.5	64.1	71.6	74.0	70.5	68.2	59.4

SRI DATA

Total Facade Area	7.8	Effective Façade Area	27.8

Frequency (Hz)	***32***	***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***
SRI Wall	25	31	37	42	52	60	63	68	68
SRI Glazing	8	14	20	19	29	33	39	45	45
SRI Roof	12	18	24	34	40	45	49	49	49
D_{ne} Vent	26	32	39	38	29	47	43	40	40
T_{wall} X S_{wall}	0.015	0.004	0.001	0.000	0.000	0.000	0.000	0.000	0.000
$T_{glazing}$ X $S_{glazing}$	0.475	0.119	0.030	0.038	0.004	0.002	0.000	0.000	0.000
T_{roof} X S_{roof}	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
T_{vent} X S_{vent}	0.005	0.013	0.003	0.003	0.025	0.000	0.001	0.002	0.000
Composite T	0.018	0.005	0.001	0.001	0.001	0.000	0.000	0.000	0.000
Composite SRI (dB)	17	23	29	28	30	42	43	41	50

BREAK IN CALCULATIONS

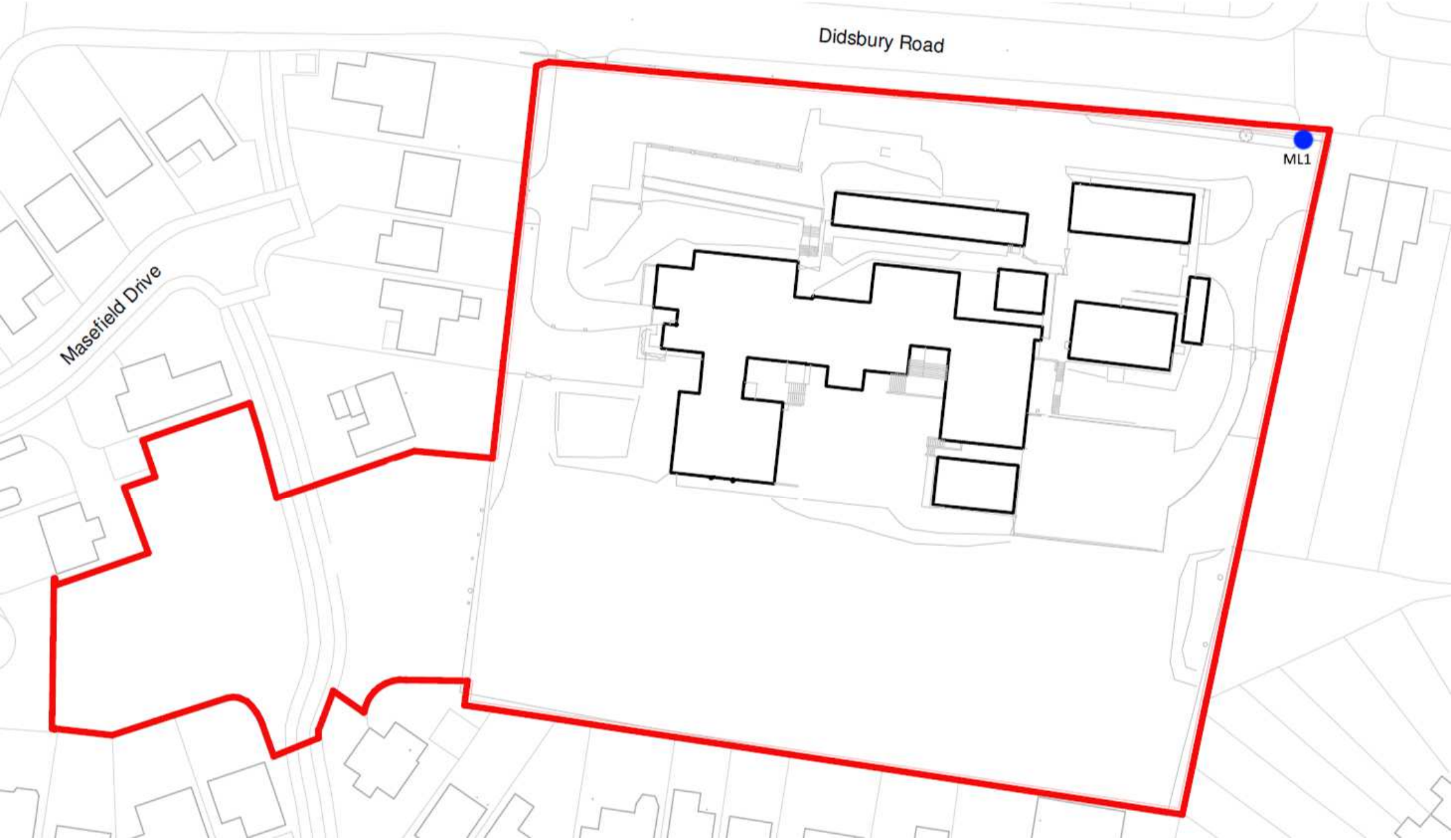
Frequency (Hz)	***32***	***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***
External Noise Level (dB)	61	61	54	52	51	57	54	49	42
Maximum External Noise Level (dB)	36	53	57	64	72	74	70	68	59
Composite SRI	17	23	29	28	30	42	43	41	50
Surface Area Correction	14	14	14	14	14	14	14	14	14
Absorption Correction	11	11	11	11	11	11	11	11	11
Source type correction	0	0	0	0	0	0	0	0	0
Distance Correction	0	0	0	0	0	0	0	0	0
Screening	0	0	0	0	0	0	0	0	0

RESULTS

Frequency (Hz)	***32***	***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***
Internal Noise Level (dB)	47	42	28	27	24	18	15	12	-5
A weighted	8	15	12	19	21	18	16	13	-6
Internal Noise Level dB(A)	**26**								

Frequency (Hz)	***32***	***63***	***125***	***250***	***500***	***1000***	***2000***	***4000***	***8000***
Internal Noise Level (dB)	22	34	32	39	45	36	31	31	13
A weighted	-18	8	16	31	42	36	32	32	12
Maximum Internal Noise Level dB(A)	**44**								

FIGURES


Didsbury Road
ML1
Masefield Drive

Key

- Didsbury Road
- Garden Fences
- Receiver

Daytime $L_{Aeq,16h}$ dB 1.5 m

<=	35.0
35.0 -	40.0
40.0 -	45.0
45.0 -	50.0
50.0 -	55.0
55.0 -	60.0
60.0 -	65.0
65.0 -	70.0
70.0 -	75.0
75.0 -	80.0
>	80.0

CLIENT: Anwyl Homes		
PROJECT: Heaton Mersey		
TITLE: Figure 2 - Daytime Noise Contours In Garden Areas		
DRG NO: GM12001/002		REV: A
DRG SIZE: A3	SCALE: 1:400	DATE: 03/12/2021
DRAWN BY MW	CHECKED BY SU	APPROVED BY SU

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Key

- Didsbury Road
- Garden Fences
- Receiver

Night time $L_{Aeq,8h}$ dB

<=	35.0
35.0 -	40.0
40.0 -	45.0
45.0 -	50.0
50.0 -	55.0
55.0 -	60.0
60.0 -	65.0
65.0 -	70.0
70.0 -	75.0
75.0 -	80.0
>	80.0

CLIENT: Anwyl Homes		
PROJECT: Heaton Mersey		
TITLE: Figure 3 - Night time Noise Contours		
DRG NO: GM12001/003		REV: A
DRG SIZE: A3	SCALE: 1:400	DATE: 03/12/2021
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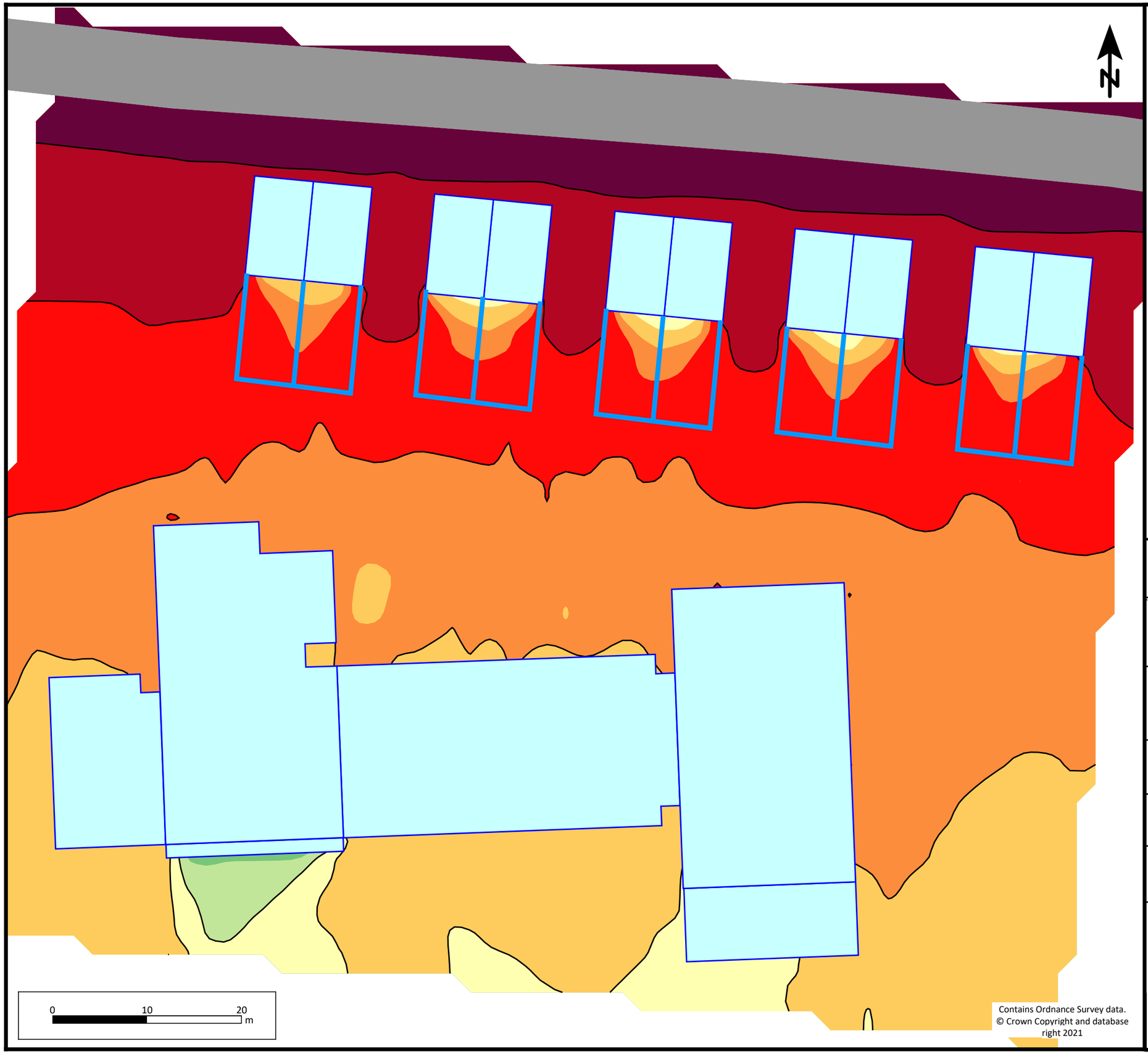

Key

- Didsbury Road
- Garden Fences
- Receiver

Night time $L_{Amax,f}$ Levels

<=	35.0
35.0 -	40.0
40.0 -	45.0
45.0 -	50.0
50.0 -	55.0
55.0 -	60.0
60.0 -	65.0
65.0 -	70.0
70.0 -	75.0
75.0 -	80.0
>	80.0

CLIENT: Anwyl Homes		
PROJECT: Heaton Mersey		
TITLE: Figure 4 - Night time Max Levels		
DRG NO: GM12001/004		REV: A
DRG SIZE: A3	SCALE: 1:400	DATE: 03/12/2021
DRAWN BY MW	CHECKED BY SU	APPROVED BY SU

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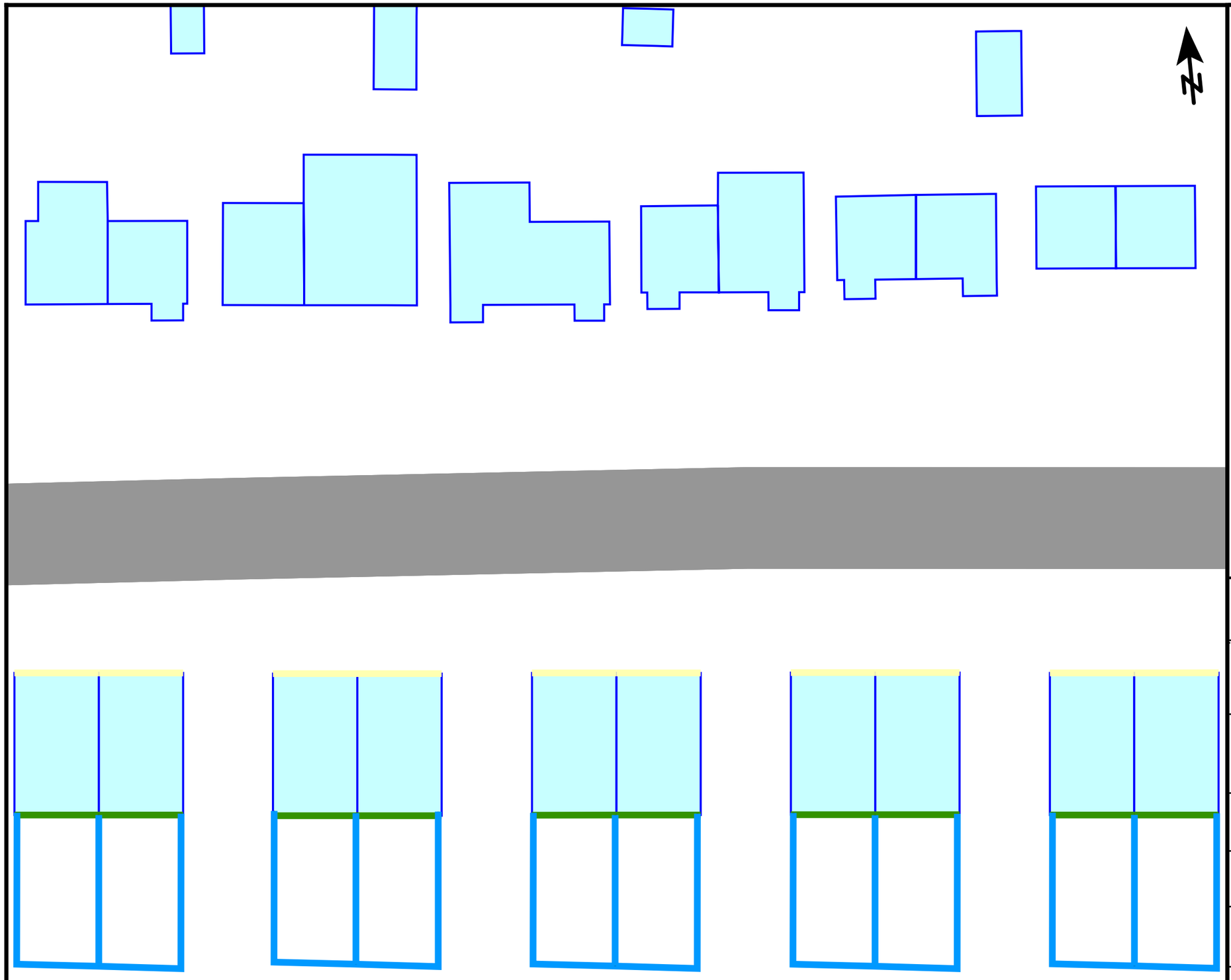

Key

Didsbury Road

1.8m Garden Fences

Houses, Ground Floor Mitigation

A - Glazing: 4/12/4 - Vent: Open Window
B - Glazing: 4/12/4 - Vent: Greenwood 2500EAW.AC1
C - Glazing: 6/12/6 - Vent: Greenwood 2500EAW.AC1

NOTE - Side Facade Ground Floor Windows shoud use Type B Mitigation

0 10 20 m

CLIENT:	Anwyl Homes
PROJECT:	Heaton Mersey
TITLE:	Figure 5 - Ground Floor Mitigation
DRG NO:	GM12001/005
REV:	A
DRG SIZE:	A3
SCALE:	1:300
DATE:	16/12/2021
DRAWN BY	MW
CHECKED BY	SU
APPROVED BY	SU

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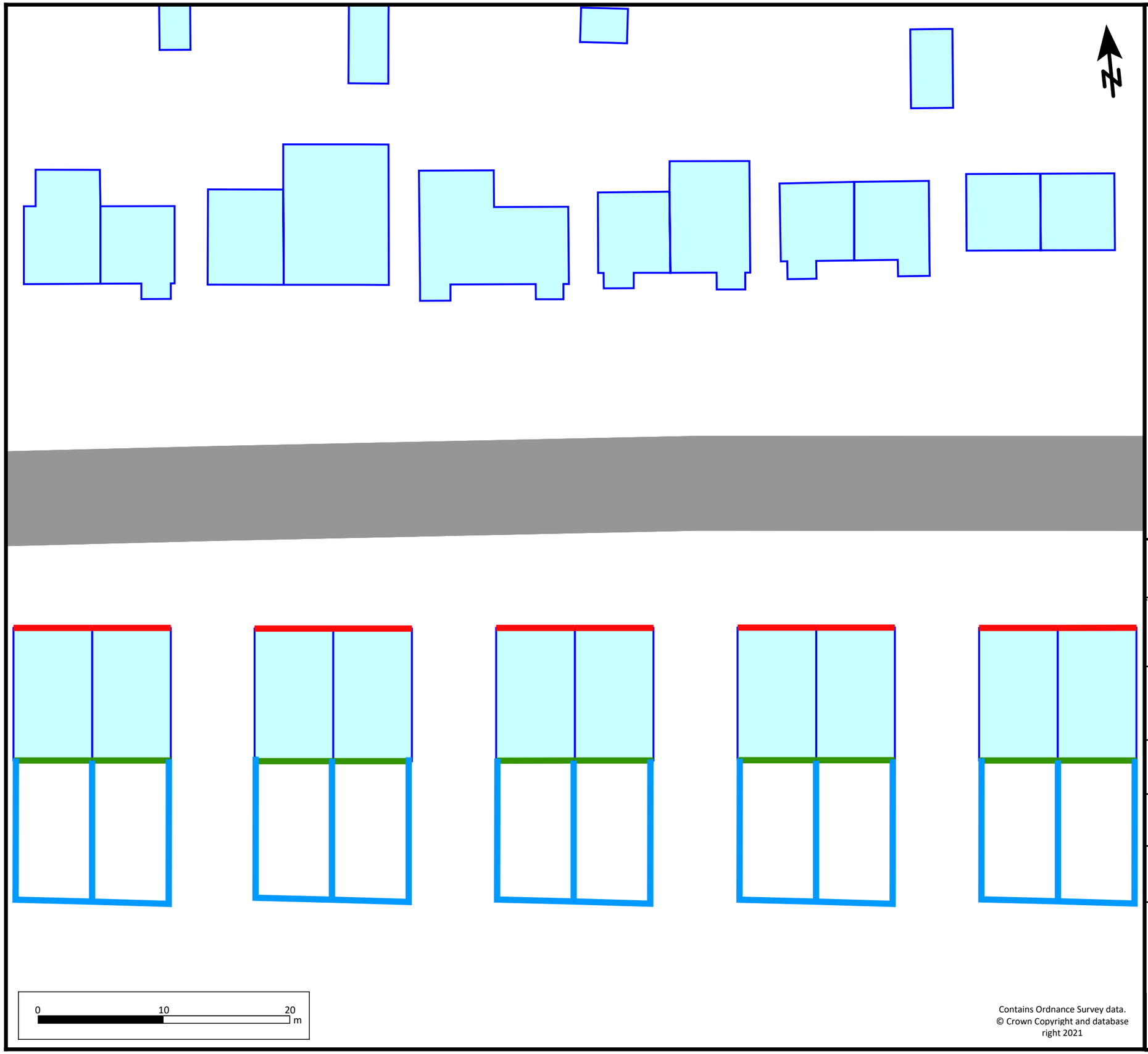

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Key

Didsbury Road

1.8m Garden Fences

Houses, First Floor Mitigation

A Glazing: 4/12/4 - Vent: Open Window
B Glazing: 4/12/4 - Vent: Greenwood 2500EAW.AC1
C Glazing: 6/12/6 - Vent: Greenwood 2500EAW.AC1

CLIENT: Anwyl Homes		
PROJECT: Heaton Mersey		
TITLE: Figure 6 - First Floor Mitigation		
DRG NO: GM12001/006		REV: A
DRG SIZE: A3	SCALE: 1:300	DATE: 16/12/2021
DRAWN BY MW	CHECKED BY SU	APPROVED BY SU

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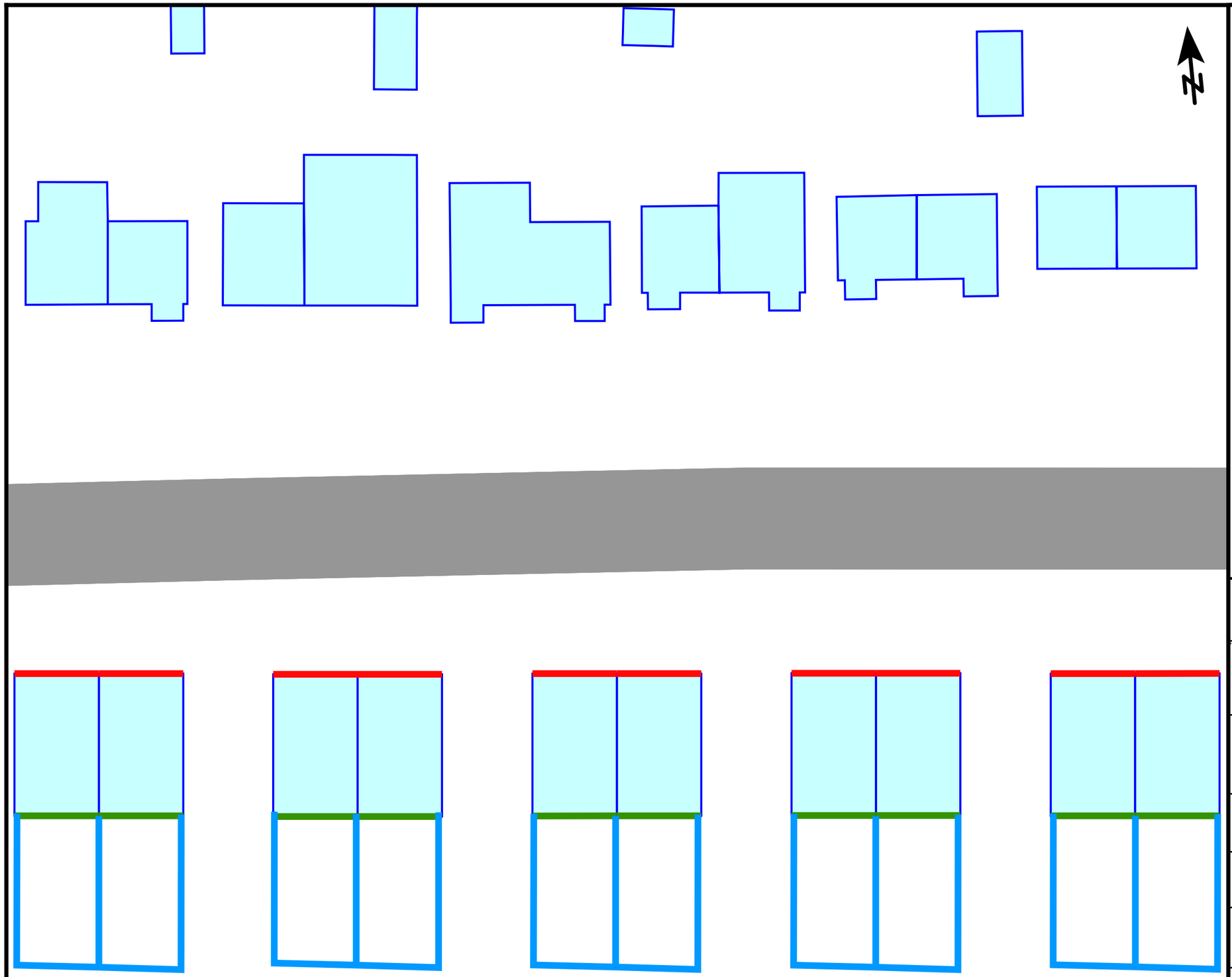

NOTE - Second Floor Windows only on South Facade

0 10 20 m

Key

Didsbury Road

1.8m Garden Fences

Houses, Second Floor Mitigation

A Glazing: 4/12/4 - Vent: Open Window
B Glazing: 4/12/4 - Vent: Greenwood 2500EAW.AC1
C Glazing: 6/12/6 - Vent: Greenwood 2500EAW.AC1

CLIENT: Anwyl Homes		
PROJECT: Heaton Mersey		
TITLE: Figure 7 - Second Floor Mitigation		
DRG NO: GM12001/007		REV: A
DRG SIZE: A3	SCALE: 1:300	DATE: 16/12/2021
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