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**CARO DEVELOPMENTS**

**CLEGG STREET, LIVERPOOL**

**NOISE ASSESSMENT REPORT**

**FEBRUARY 2018**

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**Wardell Armstrong**

2 The Avenue, Leigh, Greater Manchester, WN7 1ES, United Kingdom

Telephone: +44 (0)1942 260101 Facsimile: +44 (0)1942 261754 www.wardell-armstrong.com



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**REPORT NUMBER: 003**

**CARO DEVELOPMENTS**

**CLEGG STREET, LIVERPOOL**

**NOISE ASSESSMENT REPORT**

**FEBRUARY 2018**

**PREPARED BY:**

**N Auckland (MIOA)**

**Senior Acoustic Consultant**

A blue ink signature of N Auckland, consisting of a stylized 'N' followed by a large loop.

**R Calvert (MIOA)**

**Principal Acoustic  
Consultant**

A blue ink signature of R Calvert, written in a cursive style.

**APPROVED BY:**

**C M Dawson (MIOA)**

**Technical Director**

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## 1 INTRODUCTION

- 1.1.1 Wardell Armstrong LLP (WA) has been commissioned by Caro Developments to undertake a detailed noise assessment for a proposed residential development at Clegg Street, Liverpool.
- 1.1.2 The proposed development site is located approximately 1km to the north east of Liverpool city centre. To the north, the site is bordered by open land, with residential properties beyond. To the east, the site is bordered by Clegg Street and a site referred to as Phoenix Place at which a 7-storey residential apartment block is currently under construction. To the south, the site is bordered by Jamworks City Point student accommodation with Prince Edward Street and further development beyond. To the west, the site is bordered by Great Homer Street, and the A59 beyond. The red line boundary is shown on Drawing Number ST16464-002.
- 1.1.3 The site currently comprises a number of commercial units and the development proposals are for the demolition of the existing buildings and structures and erection of an eight-storey residential development comprising 95 apartments (C3 use), with associated access, servicing, landscaping and cycle storage. There are also 31 car parking spaces. Access to both the residential entrance and services will be from Clegg Street to the east.
- 1.1.4 A noise assessment report has been prepared in support of the detailed planning application. It assesses the results of a noise survey carried out in accordance with current guidance and makes specific recommendations for noise mitigation as appropriate.

## **2 ASSESSMENT METHODOLOGY**

### **2.1 Consultation and Scope of Works**

2.1.1 Prior to carrying out the noise assessment the potential impacts of the proposed development and general principles of the assessment methodology were sent to the Environmental Services team at Liverpool City Council. However, a response is yet to be received.

2.1.2 The potential noise issues that are addressed in this assessment are as follows:

- The impact of road traffic noise on proposed sensitive receptors;
- The impact of any proposed noise sources on proposed sensitive receptors.

2.1.3 The noise assessment takes into account current guidance, as detailed below:

- National Planning Policy Framework, 2012 (NPPF);
- Noise Policy Statement for England, 2010 (NPSE);
- Planning Practice Guidance - Noise, 2014 (PPG);
- The World Health Organisation Guidelines for Community Noise 1999 (WHO);
- British Standard 8233: 2014 Guidance on Sound Insulation and noise reduction for buildings (BS8233);
- Department of Transport's technical memorandum Calculation of Road Traffic Noise 1998 (CRTN); and
- British Standard 4142:2014 Methods for rating and assessing industrial and commercial sound (BS4142).

### **2.2 Noise Survey**

2.2.1 As part of this assessment, Wardell Armstrong LLP has carried out a survey to assess the current ambient and background noise level at proposed receptor locations. The survey is discussed in Section 3 of this report.

### **2.3 Assessment Methodology**

#### ***National Planning Policy Framework***

2.3.1 In March 2012 the 'National Planning Policy Framework' (NPPF) was introduced as the current planning policy guidance within England. Paragraph 123 of the NPPF states:

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

2.3.2 With regard to 'adverse impacts' the NPPF refers to the 'Noise Policy Statement for England' (NPSE), which defines three categories, 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'.*

2.3.3 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.

2.3.4 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
<b>Not noticeable</b>	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 Effect	No specific measures required
		No Observed Effect Level	
<b>Noticeable and not intrusive</b>	Noise can be heard and causes small changes in behaviour and/or attitude, eg turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	No Observed adverse Effect	No specific measures required
		Lowest Observed Adverse Effect Level	
<b>Noticeable and intrusive</b>	The noise causes a material change in behaviour and/or attitude, eg 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.	Observed Adverse Effect	Mitigate and reduce to a minimum
	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.	Significant Observed Adverse Effect Level	



Table 1 National Planning Practice Guidance noise exposure hierarchy			
Perception	Examples of Outcomes	Increasing Effect Level	Action
<b>Noticeable and disruptive</b>	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.	Significant Observed Adverse Effect	Avoid
<b>Noticeable and very disruptive</b>	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

2.3.5 The Noise Policy Statement for England refers to the World Health Organisation (WHO) when discussing noise impacts. The WHO Guidelines for Community Noise 1999 suggest guideline values for internal noise exposure which take into consideration the identified health effects and are set, based on the lowest effect levels for general populations. Guideline values for annoyance which relate to external noise exposure are set at 50 or 55 dB(A), representing day time levels below which a majority of the adult population will be protected from becoming moderately or seriously annoyed respectively.

- The following guideline values are suggested by WHO:
- 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  $L_{Amax}$  (fast) during the night time in bedrooms
- 50 dB  $L_{Aeq}$  (16 hour) to protect majority of population from becoming moderately annoyed
- 55 dB  $L_{Aeq}$  (16 hour) to protect majority of population from becoming seriously annoyed

2.3.6 British Standard 8233 “Guidance on sound insulation and noise reduction for buildings” 2014 bases its advice on the WHO Guidelines. 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.”*

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



*“For traditional external areas that are used for amenity space such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB  $L_{Aeq,T}$  with an upper guidance value of 55 dB  $L_{Aeq,T}$  which would be acceptable in noisier environments. 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”.*

- 2.3.8 However, there are no traditional external amenity areas proposed for the development. For these areas; BS8233 states;

*“Other locations, such as balconies, roof gardens and terraces, are also important in residential buildings where normal external amenity space might be limited or not available, i.e. in flats, apartment blocks, etc. In these locations, specification of noise limits is not necessarily appropriate. Small balconies may be included for uses such as drying washing or growing pot plants, and noise limits should not be necessary for these uses. However, the general guidance on noise in amenity space is still appropriate for larger balconies, roof gardens and terraces, which might be intended to be used for relaxation. In high-noise areas, consideration should be given to protecting these areas by screening or building design to achieve the lowest practicable levels. Achieving levels of 55 dB  $L_{Aeq,T}$  or less might not be possible at the outer edge of these areas, but should be achievable in some areas of the space.”*

- 2.3.9 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”.*

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

- 2.3.10 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.

2.3.11 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.

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

2.3.13 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 from any proposed noise sources within the development. The 'specific noise' level, of any audible industrial noise has been measured during the noise survey and are detailed in Section 3 of this report.

2.3.14 BS4142 assesses the significance of impacts by comparing the specific noise level to the background noise level ( $L_{A90}$ ). Section 3 provides details of the background noise survey undertaken.

2.3.15 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'.

2.3.16 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.

2.3.17 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.

2.3.18 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.

### 3 NOISE SURVEY

3.1.1 On the 30<sup>th</sup> and 31<sup>st</sup> October 2017 Wardell Armstrong LLP carried out a noise survey to assess the noise levels at the proposed development site.

3.1.2 Unattended noise measurements were carried out at a single monitoring location. The monitoring location (ML) is detailed in Table 2, and is shown on Drawing Number ST16464-002.

Table 2: Summary of Noise Monitoring Locations			
Monitoring Location	Location Description	Time Period Monitored	
		Start	End
1	At the southern boundary of the site, approximately 5m from Great Homer Street.	1426 hrs 30.11.17	1359 hrs 31.11.17

3.1.3 The noise measurements were made using a Class 1, integrating sound level meter. In accordance with guidance the sound level meter was mounted vertically 1.5m above the ground. However, due to the layout of the site and the existing building, the microphone was positioned approximately 1.5m from the building façade (i.e. reflective surface), therefore a façade correction will not be applied.

3.1.4 The sound level meter was calibrated to a reference level of 94dB at 1kHz both before, and on completion of, the noise survey. No drift in the calibration during the survey was noted.

3.1.5 On the 30<sup>th</sup> October 2017, the weather conditions during the survey were as follows:

- Southerly winds up to 3m/s;
- Dry ground;
- Temperature approximately +6°C; and
- 80% cloud cover.

3.1.6 On the 31<sup>st</sup> October 2017, the weather conditions during the survey were as follows:

- Southerly winds up to 3m/s;
- Dry ground;
- Temperature approximately +11°C; and
- 80% cloud cover.

3.1.7 For the purpose of this assessment daytime hours are taken to be 0700 to 2300 hours and night-time hours to be 2300 to 0700 hours.

3.1.8 A-weighted<sup>1</sup>  $L_{eq}$ <sup>2</sup> noise levels have been measured to comply with the requirements of BS8233, and WHO. A-weighted  $L_{90}$ <sup>3</sup> and  $L_{10}$ <sup>4</sup> noise levels, together with the maximum and minimum sound pressure levels to provide additional information. The measured noise levels are set out in full in Appendix A.

3.1.9 Observations allow detailed notes to be made of the significant noise sources which contribute to each of the measured levels. The observations identified the following significant noise sources at the site:

- **Road Traffic Noise:** Noise from road traffic on Great Homer Street and the surrounding road network was audible across the development site. Reduced noise levels from road traffic were noted during the night-time period.
- **Construction Noise:** Noise from construction activities associated with Phoenix Place, was occasionally audible during daytime working hours, however the majority of the noise was screened by the existing building.
- **Other sources:** Other contributing noise sources include emergency vehicle sirens, and birdsong during the daytime.

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<sup>1</sup> 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

<sup>2</sup>  $L_{eqs}$       Equivalent continuous noise level; the steady sound pressure which contains an equivalent quantity of sound energy as the time-varying sound pressure levels.

<sup>3</sup>  $L_{90}$       The noise level which is exceeded for 90% of the measurement period.

<sup>4</sup>  $L_{10}$       The noise level which is exceeded for 10% of the measurement period.

## 4 NOISE IMPACT ASSESSMENT

### 4.1 Measured Noise Levels

- 4.1.1 The measured noise levels from monitoring location 1 have been divided into daytime (0700-2300 hours) and night-time (2300-0700 hours) categories.
- 4.1.2 The results for the monitoring locations are presented in Table 3, and detailed in full in Appendix A.
- 4.1.3 The dominant noise source affecting the site is road traffic on the surrounding road network.

Table 3: Average Daytime and Night-time Noise Levels		
Time	Monitoring Location	Measured Noise Level (Figures in dB L <sub>Aeq</sub> )
0700-2300	1	72
2300-0700		66

- 4.1.4 In addition to the overall daytime and night-time noise levels, the maximum noise level measured during the night-time period of the survey, at the monitoring location, is summarised in Table 4.

Table 4: Summary of the Maximum Night-time Noise Levels (Figures in dB L <sub>Amax,t</sub> )	
Monitoring Location	Maximum Measured Noise Level
1	84

- 4.1.5 Based on the results obtained, a robust assessment can be made of the measured noise levels at the site and of the mitigation necessary to achieve the recommended noise levels at the development.

### 4.2 Proposed Noise Sources

- 4.2.1 A plant room and substation are to be located on the ground floor of the development. No noise level information is available for these rooms, however as they each have the potential to generate noise it is recommended that any external openings such as louvres or extraction fans be attenuated to ensure that noise emissions will be at or below background noise levels at the nearest proposed bedroom or living room. This will ensure that the amenity of future occupants is not affected by any industrial/commercial type noise, generated by the scheme itself.

## 5 NOISE ATTENUATION SCHEME

### 5.1 Introduction

5.1.1 The results of the noise assessment for the proposed residential areas of the development, indicate that noise mitigation measures would need to be incorporated into the proposed site design.

### 5.2 Assessment of the External Daytime Noise Levels at Proposed Apartment

5.2.1 The proposed development includes small balcony areas and Juliet balconies for a number of the proposed apartments on the upper floor. However, BS8233 states that noise level limits are not necessarily appropriate for small balcony areas. Therefore, mitigation measures are not required.

### 5.3 Assessment of Noise Levels in Living Room and Bedroom Areas

5.3.1 In accordance with the requirements of WHO and BS8233, the acceptable daytime noise level within living room areas is 35dB  $L_{Aeq}$ , and the acceptable night time noise levels in bedrooms are 30 dB  $L_{Aeq}$  and 45 dB  $L_{Amax,fast}$ .

5.3.2 The noise levels likely at the facades of the apartments closest to the main sources of noise have been determined during the daytime and night time periods. Detailed noise break in calculations have then been undertaken for daytime and night time for noise sensitive rooms. The results have been used to specify the degree of noise mitigation required at the apartments.

5.3.3 The required glazing and ventilation schemes to achieve 35dB  $L_{Aeq}$  in the combined living and dining areas, and 30dB  $L_{Aeq}$  in bedroom areas is detailed in Table 5.

Table 5: Glazing and Ventilation Requirements		
Residential Properties	Open Plan Living and Dining Rooms	Bedrooms
Residential apartments overlooking Great Homer Street, i.e. northern and western facades	10/12/6.4pvb and Passivent TVALdB 800	10/12/6.4pvb and Passivent TVALdB 800
Residential apartments overlooking Clegg Street, i.e. eastern and southern facades	4/12/4 + Passivent TVALdB 450	10/12/6 + Passivent TVALdB 450



- 5.3.4 The schemes will allow for passive ventilation to be provided in rooms to allow windows to remain closed, thereby maintaining an appropriate level of noise mitigation.
- 5.3.5 The sound reduction data of the glazing and ventilation scheme specified is detailed in Appendix B. It should be noted that the final glazing and ventilation products used should meet or exceed the specification.

## **6 CONCLUSIONS**

- 6.1.1 Wardell Armstrong has carried out a detailed noise assessment for a proposed residential development located at Clegg Street, Liverpool.
- 6.1.2 The dominant noise source, which will potentially affect the residents of the proposed residential development, is road traffic on the local road network, in particular Clegg Street and the A59.
- 6.1.3 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.
- 6.1.4 The resultant noise levels can be assessed against the guideline values suggested by the World Health Organisation. It should be remembered that the internal guideline values are health-based and are therefore relatively inflexible; however adequate noise mitigation is relatively straightforward to engineer.
- 6.1.5 To establish noise levels at the site, an unattended noise survey has been undertaken at the development site. Noise levels at the facades of the proposed residential block have been determined, and a suitable glazing and ventilation scheme has been prepared.
- 6.1.6 The proposed glazing and ventilation scheme will ensure that the relevant noise guideline levels are met across the site and will allow for passive ventilation to be provided in noise sensitive rooms where windows remain closed. It is considered that purge ventilation can be provided via extractor fans in kitchens and bathrooms and through the occasional opening of windows as required.
- 6.1.7 It is also recommended that, any external openings to noise generating rooms such as plant rooms be attenuated to ensure that noise emissions will be at or below background noise levels at the nearest proposed bedroom or living room. This will ensure that the amenity of future occupants is not affected by any industrial/commercial noise generated by the scheme itself.

## **6.2 Summary**

- 6.2.1 This noise report assesses the results of a noise survey carried out in accordance with current national guidance.

- 6.2.2 The report makes specific recommendations for noise mitigation as appropriate, and demonstrates that the noise impact associated with the proposed development will be acceptable, and noise can be adequately mitigated.
- 6.2.3 Proposed occupiers will not be exposed to unacceptably high noise levels, and the proposed development will meet the appropriate internal noise standards, with the use of mitigation, in compliance with national planning policy and guidance.

## **Appendix A**

### Noise Monitoring Results

## Appendix A

### Noise Monitoring Results

Monitoring Location 1					
Time	L <sub>Aeq</sub> (dB)	L <sub>A</sub> min (dB)	L <sub>A</sub> max (dB)	L <sub>A90</sub> (dB)	L <sub>A10</sub> (dB)
<b>30/11/2017 - Daytime</b>					
1426-2300	70.7	47.3	92.1	58.7	74.7
<b>30 + 31/11/2017 - Night Time</b>					
2300-0700	65.8	37.1	84.2	44.7	69.9
<b>31/11/2017 - Daytime</b>					
0700-1359	72.4	56.6	85.8	63.1	76.1

## **Appendix B**

### Glazing and Ventilation Sound Reduction Data

## Appendix B - Glazing and Ventilation Sound Reduction Data

Glazing Sound Reduction Data									
	Frequency (Hz)								
Description	31.5	63	125	250	500	1000	2000	4000	8000
4/12/4	12	18	24	20	25	23	29	35	35
10/12/6	14	20	26	27	34	40	38	46	46
10/12/6.4 pvb	15	21	27	29	36	41	42	52	52

Ventilation Sound Reduction Data									
	Frequency (Hz)								
Description	31.5	63	125	250	500	1000	2000	4000	8000
Passivent TVALdB 450 (Window Vent)	29.5	35.5	44.7	42.2	36.2	40.1	42.5	52.8	52.8
Passivent TVALdB 800 (Window Vent)	28.3	34.3	46.0	43.8	37.9	43.4	43.4	49.5	49.5

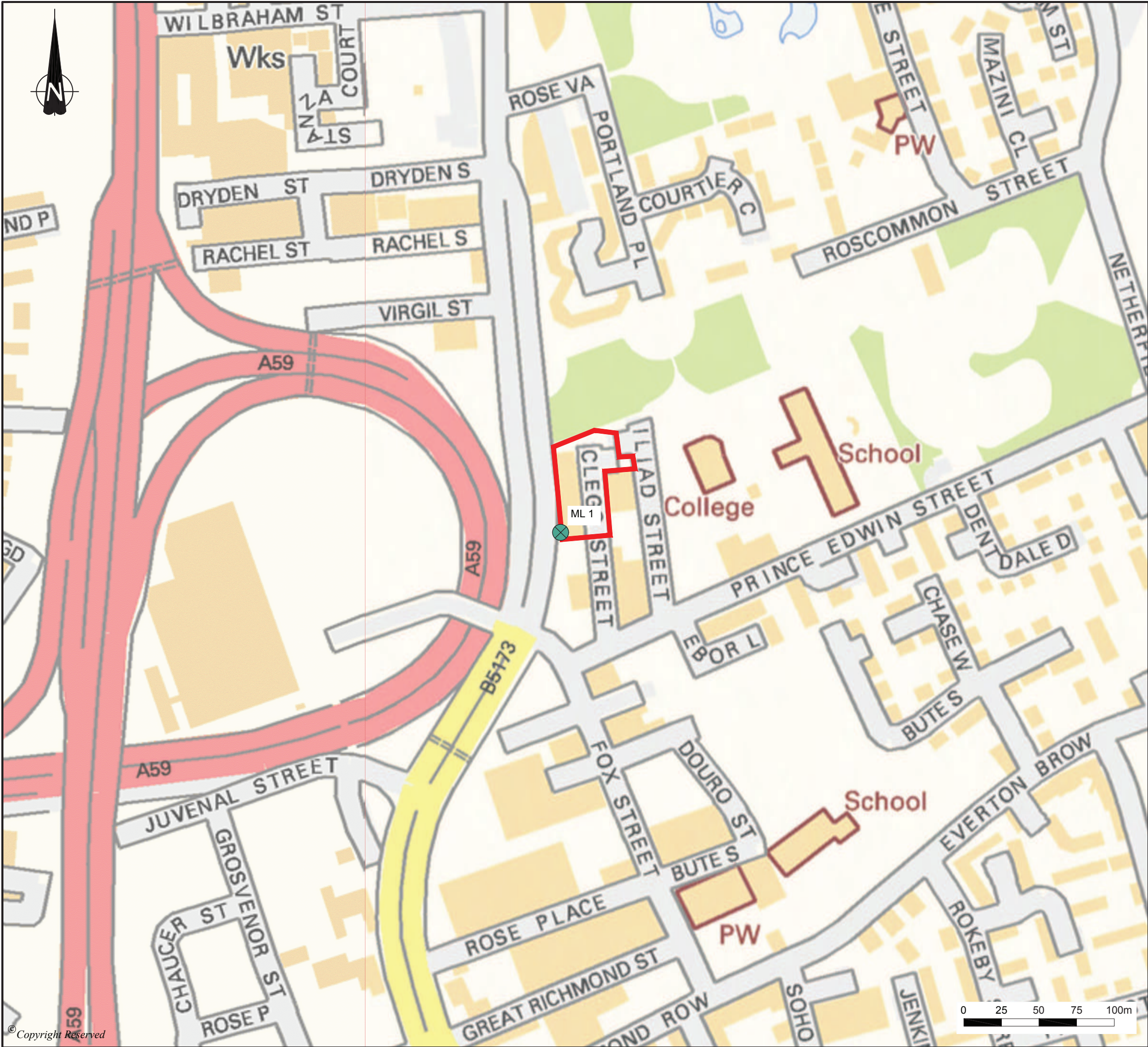
*Note - This specification has been used in the assessment, the proposed glazing and ventilation products used should meet or exceed this specification.*



## **Drawings**

Noise Monitoring Location





DO NOT SCALE FROM THIS DRAWING

REFERENCE

- SITE BOUNDARY
- ⊗ ML 1 NOISE MONITORING LOCATION

A	First Issue	07-11-17	DR	NA	MD
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REVISION	DETAILS	DATE	DR'N	CHK'D	APP'D
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CLIENT

Caro Developments

PROJECT

Clegg Street, Liverpool

DRAWING TITLE

Noise Monitoring Location

DRG No.	ST16464-002	REV	A
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DRG SIZE	A3	SCALE	1:2500	DATE	October 2017
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DRAWN BY	DR	CHECKED BY	NA	APPROVED BY	MD
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- STOKE-ON-TRENT (HEAD OFFICE) TEL 01782 276700 WEB: WWW.WARDELL-ARMSTRONG.COM
- |                                     |  |                                    |                                  |
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STOKE-ON-TRENT  
Sir Henry Doulton House  
Forge Lane  
Etruria  
Stoke-on-Trent  
ST1 5BD  
Tel: +44 (0)178 227 6700

BIRMINGHAM  
Two Devon Way  
Longbridge Technology Park  
Longbridge  
Birmingham  
B31 2TS  
Tel: +44 (0)121 580 0909

CARDIFF  
22 Windsor Place  
Cardiff  
CF10 3BY  
Tel: +44 (0)292 072 9191

CUMBRIA  
Marconi Road  
Burgh Road Industrial Estate  
Carlisle  
Cumbria  
CA2 7NA  
Tel: +44 (0)122 856 4820

EDINBURGH  
Great Michael House  
14 Links Place  
Edinburgh  
EH6 7EZ  
Tel: +44 (0)131 555 3311

GLASGOW  
2 West Regent Street  
Glasgow  
G2 1RW  
Tel: +44 (0)141 433 7210

LONDON  
46 Chancery Lane  
London  
WC2A 1JE  
Tel: +44 (0)207 242 3243

MANCHESTER (City Centre)  
76 King Street  
Manchester  
M2 4NH  
Tel: +44 (0)161 817 5038

MANCHESTER (Greater)  
2 The Avenue  
Leigh  
Greater Manchester  
WN7 1ES  
Tel: +44 (0)194 226 0101

NEWCASTLE UPON TYNE  
City Quadrant  
11 Waterloo Square  
Newcastle Upon Tyne  
NE1 4DP  
Tel: +44 (0)191 232 0943

SHEFFIELD  
Unit 5  
Newton Business Centre  
Newton Chambers Road  
Thornccliffe Park  
Chapelton  
Sheffield  
S35 2PH  
Tel: +44 (0)114 245 6244

TRURO  
Baldhu House  
Wheal Jane Earth Science Park  
Baldhu  
Truro  
TR3 6EH  
Tel: +44 (0)187 256 0738

International offices:  
ALMATY  
29/6 Satpaev Avenue  
Regency Hotel Office Tower  
Almaty Kazakhstan  
050040  
Tel: +7(727) 334 1310

MOSCOW  
21/5 Kuznetskiy Most St.  
Moscow  
Russia  
Tel: +7(495) 626 07 67