



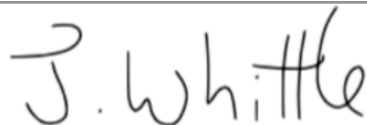
NS JV LTD

CITY WORKS, OPENSHAW, MANCHESTER

BREEAM 2018 HEA05 DESIGN ASSESSMENT - SHELL ONLY
R2090-REP02E-JW

2 MAY 2024

REPORT DETAILS

Project	City Works, Openshaw, Manchester		
Client	NS JV LTD Centrix House Crow Lane East Newton Le Willows St Helens WA12 9UY		
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1.0 INTRODUCTION

Red Acoustics has been commissioned by NS JV Ltd to assess the proposed industrial buildings at City Works, Openshaw, Manchester for compliance with the HEA 05 credit requirement of BREEAM 2018, New Construction, Non-Domestic Buildings (United Kingdom) for shell only.

This report presents the results of an environmental sound survey and sound break-in calculations. Target criteria have been identified for target internal noise levels. The assessment is suitable for submission to the BREEAM assessor for compliance with the HEA 05 requirements of BREEAM.

The assessment indicates that based on current proposals, compliance with the target criteria is likely to be achieved.

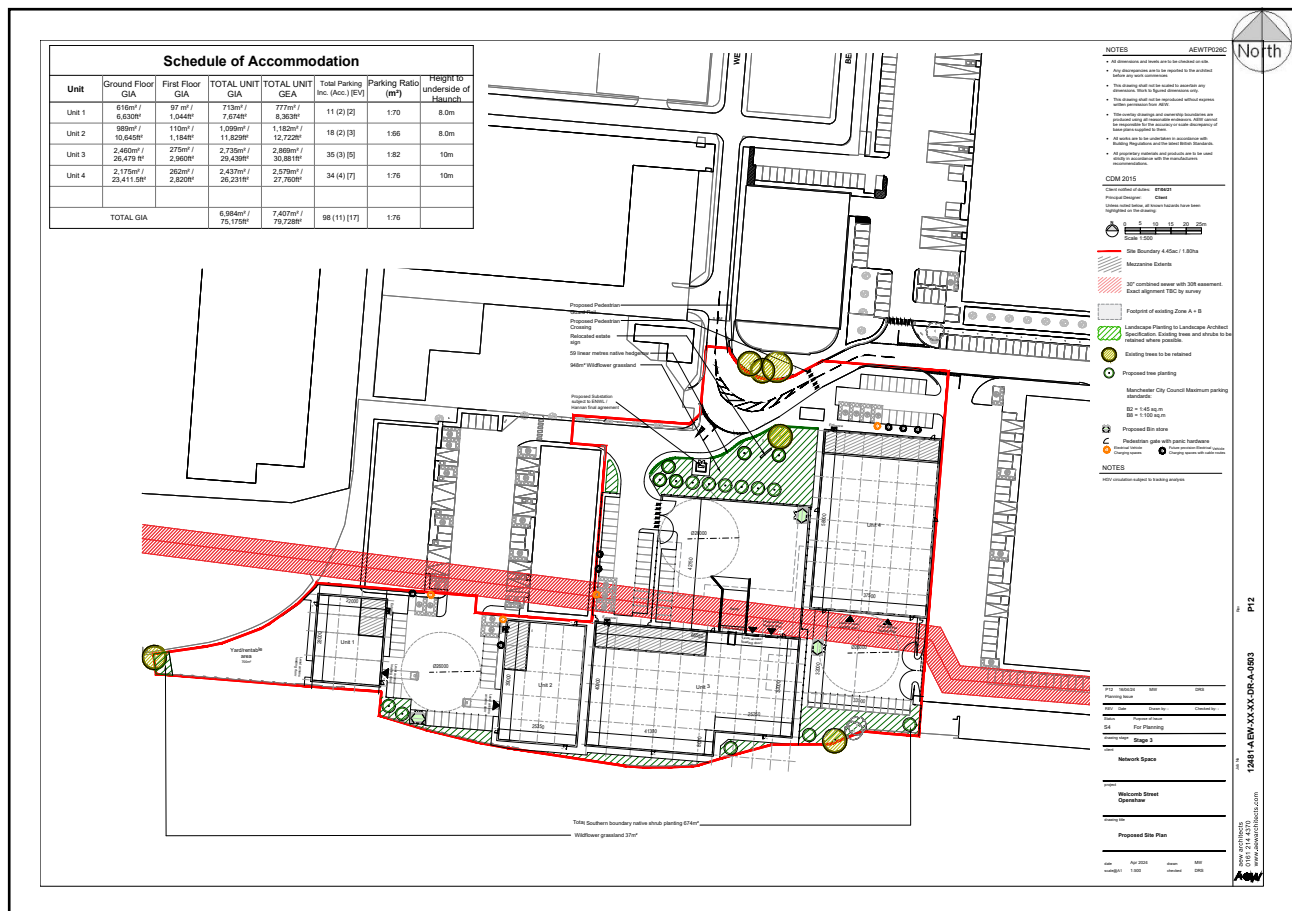
2.0 PROJECT & SITE DESCRIPTION

The development considered, consists of the new construction of an industrial, commercial facility. The proposed development consists of four mixed sized Industrial units. It is currently assumed that the units will be 'shell-only' with all fit-out to be undertaken by the future tenants.

Figure 2.1 below shows the location of the site in relation to the surroundings and Figure 2.2 show the proposed drawn site layout.

Figure 2.1: Site Location





3.0 PERFORMANCE STANDARDS

BREEAM 2018 New Constructions UK - Hea 05 Design Targets for Shell Only

The Aim of Hea 05 is to ensure the building is capable of providing an appropriate acoustic environment to provide comfort for building users. To establish the specific assessment scope the relevant BREEAM 2018 document extract detailing applicable assessment criteria and the specific assessment type are shown below in Tables 3.1 & 3.2 respectively, with the relevant scope and assessment type highlighted.

Assessment Scope

Table 3.1: BREEAM 2018 New Constructions UK - Assessment Scope: Extract

	Fully fitted	Simple building	Shell and core	Shell only
Applicable assessment criteria	All	All	1.b only, or 2 or 3.b on page 112 only (see ref 2.0)	1.b only, or 2 or 3.b on page 112 only (see ref 2.0)
Assessment type specific notes	None	None	see ref 1.0 and 1.1	see ref 1.0 and 1.1

For shell only buildings the applicable assessment criteria should be chosen from: 1.b, 2 or 3b. These applicable assessment criteria relate solely to Indoor ambient noise levels, with only one credit being available.

BREEAM 2018 states:

Up to three credits - Acoustic performance

For all building types, except Residential institutions (short term and long term stay), which have four credits available below.

- 1 *The building meets the appropriate acoustic performance standards and testing requirements defined in the relevant table below. These tables define criteria for the acoustic principles of:*

- 1.a *Sound insulation*
- 1.b *Indoor ambient noise level*
- 1.c *Room acoustics.*

OR

- 2 *A suitably qualified acoustician (SQA) is appointed to define a bespoke set of performance requirements for all function areas in the building. The bespoke performance requirements use the three acoustic principles defined in*

criterion Hea 05 Acoustic performance - Criterion 1 above, setting out the performance requirements for each and the testing regime required.

Table 3.2: BREEAM 2018 New Constructions UK- Specific Notes: Extract

Assessment type specific	
1.0	Alternative means of compliance The basic built form has a large impact on the acoustic performance of the building and would be outside the control of the tenant. A suitably qualified acoustician (SQA) must carry out a quantifiable assessment of the specification of the build form, construction and any external factors likely to affect the indoor ambient noise levels. The SQA must then confirm the developer's works will enable a future tenant utilising a typical fit-out and specification to meet the levels required to demonstrate compliance.
1.1	Bespoke performance requirements When assessing criteria 2 below for a shell and core or shell only building, only Indoor ambient noise level below should be assessed.
Building type specific	
2.0	Residential institutions (short term and long term stay) When assessing a shell and core or shell only residential institution, only Indoor ambient noise level below should be assessed.

Once the assessment scope and type has been identified the reference 'building type' criteria methodology must be followed. BREEAM 2018 extract for Industrial building types is detailed in Table 3.3, with the relevant criteria methodology highlighted.

Table 3.3: BREEAM 2018 New Constructions UK - Acoustic Criteria for Industrial Building Types

Industrial, Retail, Prisons and Other building types (three credits)	
First credit-Sound insulation	
All room functions	
Criteria	The sound insulation between rooms and other occupied areas complies with the performance criteria given in Section 7 of BS 8233:2014. Alternatively, propose performance standard based on demonstrably best practice.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology on the facing page section of this BREEAM issue.
Rooms with specific functions	Educational space (teaching and lecture spaces) refer to Table 5.14 on page 109 Medical treatment rooms refer to Table 5.15 on page 110
Second credit – Indoor ambient noise levels	
Criteria	Achieve indoor ambient noise levels that comply with the design ranges given in Section 7 of BS 8233:2014.
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology on the facing page section of this BREEAM Issue.
Rooms with specific functions	Education space (teaching and learning spaces) refer to Table 5.14 on page 109 Medical treatment rooms refer to Table 5.15 on page 110
Third credit - Room acoustics	
Criteria	Achieve the requirements relating to sound absorption and reverberation times, where applicable, set out in Section 7 of BS 8233:2014
Testing requirement	A programme of pre-completion acoustic testing is carried out by a compliant test body in accordance with the acoustic testing and measurement procedures outlined in the Methodology on the facing page section of this BREEAM issue. For spaces where the acoustic environment is controlled through the use of defined amounts of sound absorption, installation of a specification compliant with the BS 8233:2014 criteria demonstrates compliance. A site inspection by the developer or SQA is required to confirm that a compliant specification has been installed.
Rooms with specific functions	Educational space (teaching and learning spaces) refer to Table 5.14 on page 109 Medical treatment rooms refer to Table 5.15 on page 110

The specific design target performances for the 'Industrial Building Types' in relation to the Hea 05 credit requirements are summarised below.

To achieve the BREEAM criteria for Hea 05 for the shell only 'Industrial Buildings Types' the targets shown in Table 3.4 below are applicable and are in line with Section 7 BS8233:2014.

Table 3.4: Internal Noise Levels

Relevant Space	Indoor Ambient Noise Level Target dB L _{Aeq,t}
Warehouse Spaces	50-55
Office Spaces	35-45

In order that the credit can be awarded for the Hea 05 elements, commissioning testing in accordance with the BREEAM 2018 guidance will be required once the buildings are complete and the results presented in a commissioning report to the BREEAM assessor.

4.0 ENVIRONMENTAL SOUND SURVEY

An environmental sound survey has been carried out by Red Acoustics to determine the prevailing sound climate at the development site. At this stage the proposed operational hours of the industrial development are unknown, to assess the noise ingress from environmental sources, namely adjacent existing industrial noise sources and local road traffic noise the measured noise levels from 07:00hrs to 19:00hrs were employed to capture the two main 'rush hour' periods and potential worst case external environmental noise sources.

Measurements were undertaken by Red Acoustics at monitoring positions MP1 & MP2 over an extended 7 day period; 12th to 18th May 2022. The measurements were undertaken to determine the sound climate impacting the facades of the development from the surrounding environmental noise sources; industrial sites and the local road traffic. These measured sound levels have been employed for the purpose of undertaking a sound break-in calculation for assessment of indoor ambient noise levels for the proposed site.

Figure 4.1 below shows the location of the monitoring positions. Figures 4.2 & 4.3 show the surveys results.

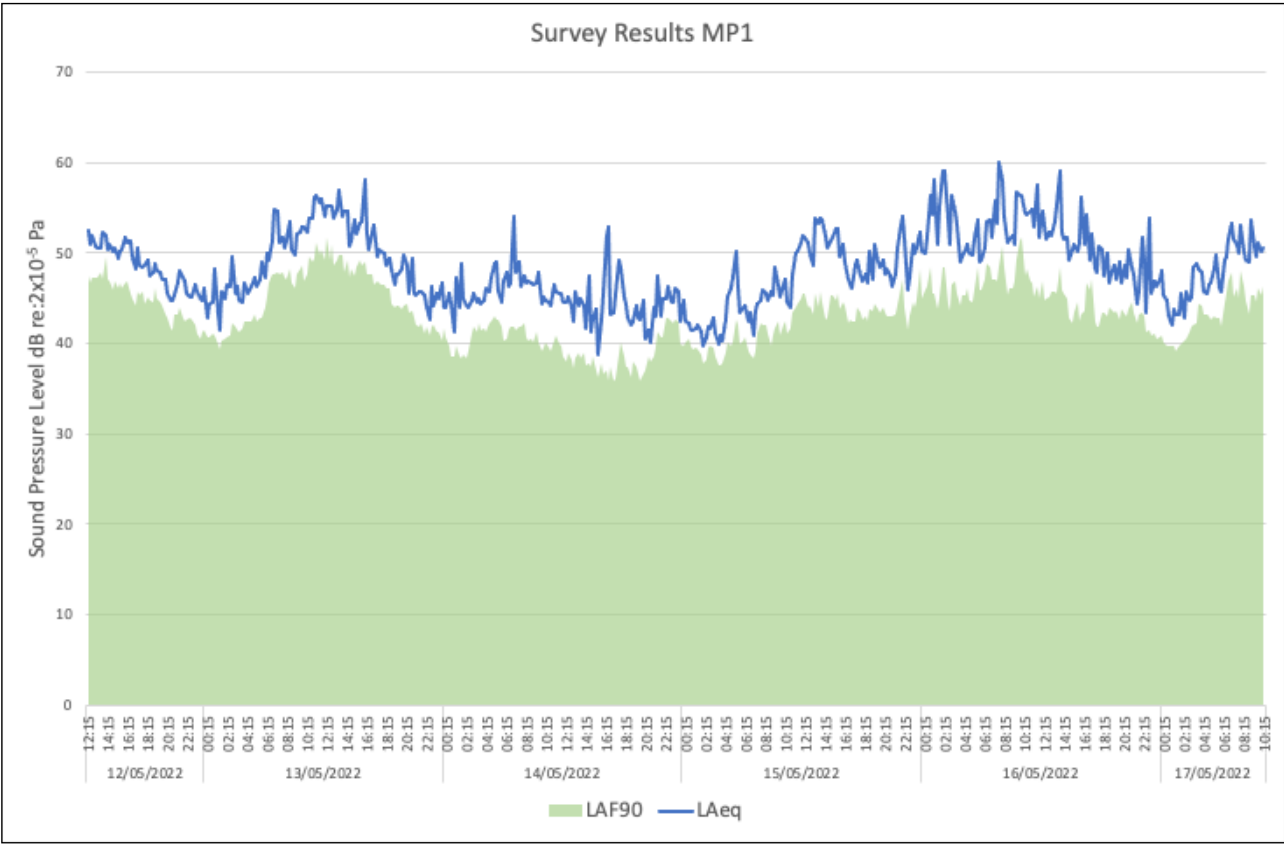
Figure 4.1: Survey Monitoring Positions



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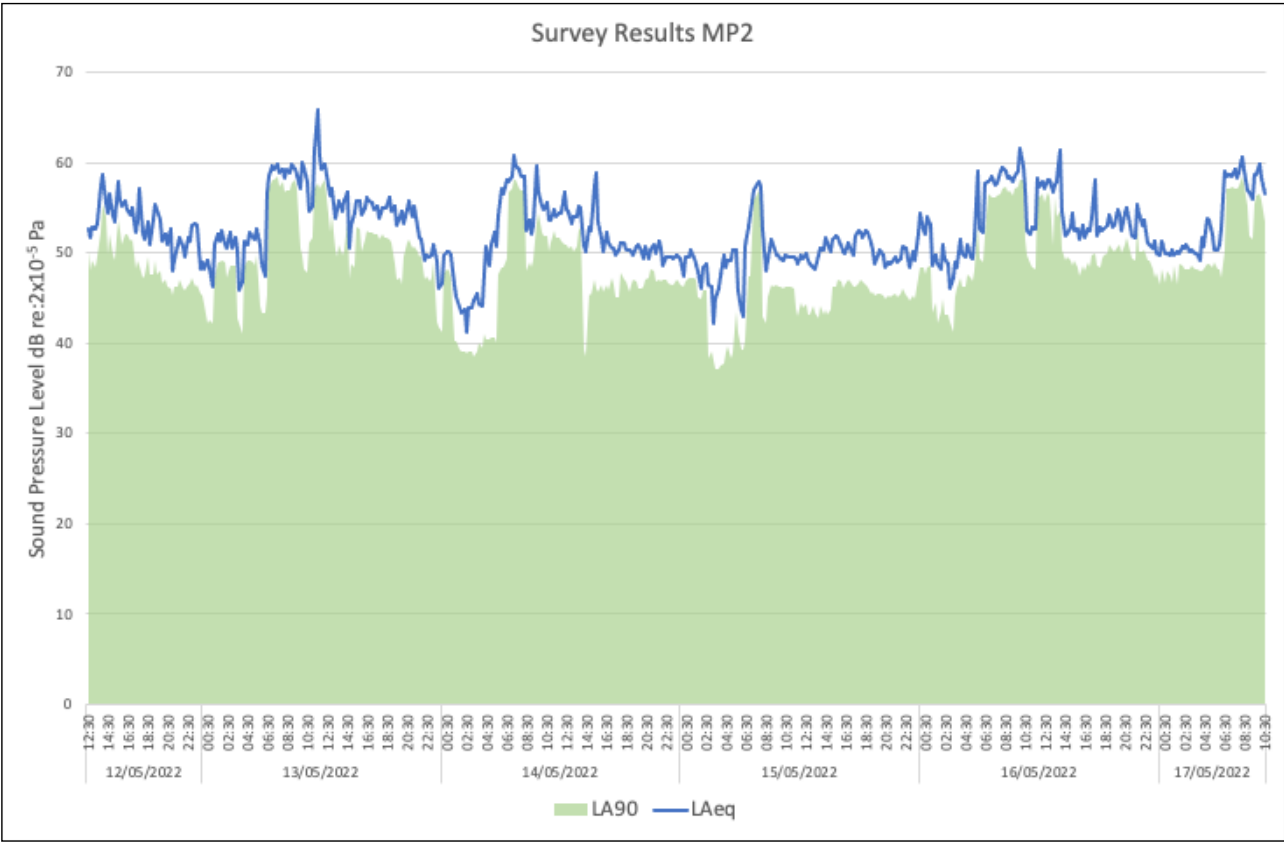
Figure 4.2: Survey Results MP1



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Figure 4.3: Survey Results MP2



The measurement at MP1 shows the typical daytime (07:00hrs to 19:00hrs) external sound level to be 39-60dBA with the typical daytime $L_{Aeq,12hr}$ being 54dBA. The measurement at MP2 shows the typical daytime (07:00hrs to 19:00hrs) external sound level to be 48-66dBA with the typical daytime $L_{Aeq,12hr}$ being 57dBA. The measured daytime typical octave band sound levels for the measurement period are shown in Table 4.1 below. These have been used in sound break-in calculations to assess the proposed construction for compliance with the target indoor ambient noise levels.

Table 4.1: Measured External Sound Levels

Position	Period	Measurement Period	Octave Band Centre Frequency Hz / dB					Measured Broadband (dBA)
			125	250	500	1000	2000	
MP1	Daytime Typical	$L_{Aeq,12hr}$	56.7	52.1	48.2	48	48.5	53.8
MP2	Daytime Typical	$L_{Aeq,12hr}$	59.9	58.5	55.0	50.5	47.2	56.8

Based on the measured external noise levels presented in Table 4.1 above and drawn information in relation to the proposed site layout, a noise break-in calculation has been undertaken for the Industrial development. The noise break-in calculation has been undertaken in line with the methodology outlined in BS8233:2014. Table 4.2 below presents the results of the noise break in calculation and compares this with the target indoor ambient noise level discussed above.

Office noise break in calculation assume basic office fit-out measures such as internal wall linings, soft floor finishes, ceilings at a height of 2.4m and standard double glazed window units without trickle ventilators. As drawn information in relation to the building fabric is not currently available, and for the purpose of the assessment and calculation, the building envelope is assumed to be a portal framed design which includes a standard single skin insulated cladding material for the wall and roof areas. The assumed sound reduction performance of a standard single skin insulated cladding material be $\leq 24dB R_w$ which is based on manufacturer data. Roller shutter doors were also accounted for using performance data held on file by Red Acoustics.

Table 4.2: Predicted IANL vs. Target

Location	Period	Predicted IANL dBA	Target IANL (dBA)
Warehouse Space	Daytime Typical	45-55	55
Office Space		40-45	45

5.0 ACOUSTICIAN CREDENTIALS

Red Acoustics Ltd is an accredited test body registered with the Association of Noise Consultants. The author of this report and the holds a Post Graduate Diploma in Noise Control Engineering issued by the Institute of Acoustics. The author is also an associate member of the Institute of Acoustics and full member of the Chartered Institute of Environmental Health with over 20 years experience in the assessment of noise. The author therefore complies with the requirements of a suitably qualified acoustician and is qualified to undertake the on-site testing and prepare the report for submission for the credits to be awarded.

Red Acoustics are accredited under the ANC scheme for undertaking pre-completion commissioning tests as an approved test body registered number 180.



6.0 CONCLUSION

An assessment of noise impact on the proposed Industrial development at City Works, Openshaw, Manchester has been undertaken to assess compliance with the requirements of BREEAM Hea 05. Recommended performance standards have been identified for indoor ambient noise levels.

Commissioning measurements will be undertaken following completion of the development to confirm compliance.

APPENDIX A: NOISE SURVEY DETAILS

Location

Welcomb Street, Openshaw, Manchester.

Survey Dates

12th May to 18th May 2022

Weather

Conditions during the surveys were dry with wind speeds $<5\text{ms}^{-1}$

Personnel

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Johnathan Whittle BSc (Hons), Pg. Dip. IOA AMIOA MCIEH.

Instrumentation

Table A1 below presents the instrumentation used during the surveys.

Methodology

Before and after the measurements the sound level meters were check calibrated to an accuracy of $\pm 0.3\text{dB}$ using their associated Class 1 Calibrators. No drift in the instruments' sensitivities were noted across any of the survey periods.

Calibration Certificates

Copies of all calibration certificates are kept on file by Red Acoustics Ltd and can be supplied if requested.

Table A1: Instrumentation

Equipment Description	Type Number	Manufacturer	Serial Number	Date of Last Calibration	Calibration Certificate Number
Sound Level Meter	CR:171B Type 1	Cirrus	G056973	25-Jun-20	35032
Microphone	MK:224	Cirrus	606043B	25-Jun-20	35031
Preamplifier	CRL:MV200F	Cirrus	0805F	25-Jun-20	35032
Sound Calibrator	CR:515 Type 1	Cirrus	59150	12-Aug-21	38703
Sound Level Meter	SVAN 957 Type 1	SVANTEK	28043	06-May-21	1500255-3
Preamplifier	SVAN SV12L	SVANTEK	31143	06-May-21	1500255-3
Microphone Capsule	SVAN 7052E	SVANTEK	53617	06-May-21	1500255-3
Sound Calibrator	Type 1251 IEC 60942-1997 Class 1	Norsonic	31040	12-Aug-21	38705