

Church Inn, Manchester

Noise Assessment Report

Alumno Developments Ltd

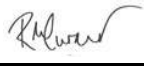
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Contents

1.0	Introduction	2
2.0	Assessment Criteria	4
2.1	Noise Policy Statement for England	4
2.2	National Planning Policy Framework	4
2.3	Planning Practice Guidance	5
2.4	BS 8223:2014 'Guidance on sound insulation and noise reduction for buildings'	5
2.5	Local Authority noise policy guidance	5
3.0	Environmental Noise Survey	7
3.1	Site Context	7
3.2	Noise survey methodology	8
3.3	Results summary	8
4.0	Noise Impact Assessment	11
4.1	Environmental Noise Model	11
4.2	Building envelope calculations	11
4.3	Glazing specification	11
5.0	External Plant Noise	16
5.1	Nearest noise sensitive receptors	16
5.2	Limiting noise levels	16
6.0	Conclusions	18
Appendix I	Environmental Noise Data	20
Appendix II	Acoustic Façade Noise Model	21

1.0

Introduction

1.0 Introduction

Cundall has been instructed by Alumno Developments Ltd to undertake a noise assessment for a proposed residential development at Cambridge Street, Manchester.

Submitted proposals are for a nine-storey building with a total of 62 bed spaces comprising;

- Four DDA compliant studios; and
- 58 studios

To establish the prevailing noise climate across the existing site, noise surveys have been undertaken by Cundall on the 22 and 23 May 2018.

The purpose of this assessment is to evaluate the findings of the surveys in relation to the proposed residential scheme being brought forward and, if required, provide recommendations for mitigation measures in order to achieve a comfortable internal acoustic environment, in line with the relevant British Standards and local and national Planning Policy.

The scope of the assessment is based on the technical guidance provided by the Local Planning Authority, good practice techniques and extensive previous experience of similar projects.

2.0

Assessment Criteria

2.0 Assessment Criteria

This section of the report outlines the key legislation and guidance relevant to the assessment of noise for a development of this type.

2.1 Noise Policy Statement for England

The Noise Policy Statement for England (NPSE) was published by Defra in March 2010. This NPSE sets out the long-term vision of Government noise policy:

“Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.”

The NPSE long term vision is supported by the following aims:

“Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *Avoid significant adverse impacts on health and quality of life;*
- *Mitigate and minimise adverse impacts on health and quality of life; and*
- *Where possible, contribute to the improvement of health and quality of life.”*

2.2 National Planning Policy Framework

The revised National Planning Policy Framework was updated on 19 February 2019 and sets out the Government's planning policies for England and how these are expected to be applied.

This revised Framework replaces the previous National Planning Policy Framework published in March 2012 and revised in July 2018. The NPPF states:

170. Planning policies and decisions should contribute to and enhance the natural and local environment by; [...]

e) preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability. Development should, wherever possible, help to improve local environmental conditions such as air and water quality, taking into account relevant information such as river basin management plans;

180. Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts 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 impacts 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; [...]

182. Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses 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.”

2.3 Planning Practice Guidance

The Planning Practice Guidance for noise was published in 2014 and updated in March 2019. This online document advises on how planning can manage potential noise impacts in new development.

2.4 BS 8223:2014 'Guidance on sound insulation and noise reduction for buildings'

British Standard 8223:2014 provides guidance on internal ambient noise levels in residential spaces. The following table summarises this guidance:

Location	Day (07:00 – 23:00 hours)	Night (23:00 – 07:00 hours)
Bedroom	≤ 35 dBA $L_{Aeq,16\text{hour}}$	≤ 30 dBA $L_{Aeq,8\text{hour}}$

Table 1 – BS 8223:2014 Indoor ambient noise levels in unoccupied spaces

BS 8223:2014 does not provide internal noise criteria for individual events in terms of L_{AFmax} . However, it does state:

“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. Sporadic noise events could require separate values.”

2.5 Acoustics Ventilation and Overheating Guide

In 2020 the Association of Noise Consultants (ANC) and Institute of Acoustics (IoA) jointly published the Acoustics, Ventilation and Overheating Guide (AVO Guide). This document provides guidance on how to assess noise impacts related to the ventilation and overheating design in residential buildings. Assessment in accordance with this guide is outside of the scope of this assessment.

2.6 Local Authority noise policy guidance

2.6.1 Residential development

Manchester City Council's guidance on planning and noise are outlined in section 3.0 of Manchester City Council's Planning & Noise Technical Guidance document (December 2015).

Section 3.6.1.1 of the document relates to internal noise limits for residential properties and states:

“Manchester City Council has adopted the following internal noise limits for residential properties:

- *Bedrooms (night-time – 23.00 – 07.00) 30 dB L_{Aeq} (individual noise events should not normally exceed 45 dB $L_{Amax,F}$ by more than 15 times)*
- *Living Rooms (daytime – 07.00 – 23.00) 35 dB L_{Aeq}*

2.6.2 Noise and vibration from fixed plant / equipment

Section 3.6.1.5.1 of the document relates to noise limits for building services plant and states:

“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.”

3.0

Environmental Noise Survey

3.0 Environmental Noise Survey

3.1 Site Context

The development site is located in central Manchester and currently comprises the vacant 'The Church Inn' public house. Proposals are for the development of 62 new student apartments.

The site is bounded by Cambridge Street to the north-east, and the existing five-storey Cambridge House and Manchester House apartment buildings to the north-west and south-east, respectively. Cambridge Street is a major arterial route to Manchester city centre and is heavily trafficked during the daytime and moderately trafficked during the night-time.

To the south west of the development lie existing three-storey terrace houses accessed off Chervil Close and Cavendish Street.

An aerial photograph indicating the indicative red line site boundary and proposed building footprint (orange) is presented in Figure 1 below:



Figure 1 – Proposed development location

3.2 Noise survey methodology

In order to assess the prevailing levels of environmental noise affecting the proposed development, daytime and night-time environmental noise surveys were undertaken at two locations. The attended daytime noise monitoring was carried out between 06:00 to 11:00 hours on the 23 May 2018 with night-time monitoring between 23:00 and 02:00 hours on the 22 to 23 May 2018.

The approximate measurement locations are shown in Figure 2 below:



Figure 2 - Noise measurement positions

The weather conditions during both surveys were calm and dry, with temperatures around 10°C and wind speeds below 5 m/s.

Noise measurements were made using a Casella CEL 633 (serial number 1211404) precision sound level meter, generally in accordance with BS EN 60651:1994 and BS 7445:1993. The meter was field calibrated before and after with no significant drift witnessed. Calibration certificates for all equipment are available upon request.

Monitoring equipment was set up by competently trained Cundall staff and all measurements have been reported for free-field conditions. Subjective impressions from site were that the noise climate was generally dictated by road traffic on local roads.

3.3 Results summary

A summary of the average ambient noise levels recorded is detailed within . The values are the logarithmically averaged $L_{Aeq,15min}$, the typical $L_{AFmax,15min}$ and the range of $L_{A90,15min}$ and $L_{A10,15min}$ values measured. All values have been rounded to the nearest integer value (as fractions of a decibel are imperceptible) and are given in dBA.

Monitoring Location	Assessment period	Duration	Average $L_{Aeq,15min}$ (dB)	Typical ** $L_{AFMax,15min}$ (dB)	Range $L_{A10,15min}$ (dB)	Range $L_{A90,15min}$ (dB)
MP1	Daytime	07:00 – 09:30 hrs	71	87	74 – 75	63 – 65
	Night-time	23:00 – 00:30 hrs*	66	83	70 – 71	56 – 58
		06:00 – 07:00 hrs	69		71 – 74	60 – 64
MP2	Daytime	09:45 – 11:15 hrs	60	73	60 – 67	56 – 57
	Night-time	00:45 – 02:15 hrs	52	73	53 – 57	46 – 49

*Measurements during the period between 23:15 – 23:30 hours have been excluded from summary values above due to erroneous continuous noise from ambulance sirens very close to the microphone position.

** Typical L_{AFmax} has been defined as the 3rd highest value to occur during night-time measurements at MP1. In the absence of recorded L_{AFmax} data for the full 8-hour night-time period, this is considered representative of a worst-case assumption for the highest L_{AFmax} value to occur up to 15 times during a single night.

Table 2 – Summary of noise measurement data

Full single-figure survey results are presented in Appendix I of this report.

4.0

Noise Impact Assessment

4.0 Noise Impact Assessment

Based on guidance given in BS 8233:2014 and the Local Authority noise policy requirements, the external building fabric for residential dwellings is to be designed such that a maximum steady-state internal night-time noise level of $L_{Aeq,8hours}$ 30 dBA and a daytime level of $L_{Aeq,8hours}$ 35 dBA can be achieved within habitable rooms.

For a reasonable standard in bedrooms, the Local Authority requirements also state that individual noise events should not normally exceed 45 dB $L_{Amax,F}$ by more than 15 times.

It is considered that suitable glazing and ventilation attenuation can be provided to habitable rooms, such that internal average noise levels would be within acceptable limits, as per BS 8233.

4.1 Environmental Noise Model

In order to determine road traffic noise propagation across the proposed development site, a model has been produced using SoundPLAN 8.0 acoustic modelling software. This model is capable of accurately determining sound propagation, by taking into account variations in topography, barrier attenuation provided by existing landscaping and buildings, and distance attenuation.

Road traffic noise sources within the 3D model have been calibrated based upon the average L_{Aeq} results obtained during the attended daytime and night-time noise surveys.

The resultant façade noise maps are presented in Appendix II of this report. Levels shown in these figures and referred to in the following sub-sections are 'free-field values' at the façade i.e. they do not include additional contribution from acoustic reflections from the proposed building façade.

4.1.1 Discussion

It can be seen from façade noise maps presented in Appendix II that predicted noise levels at façades directly overlooking Cambridge Street are up to 70 dB $L_{Aeq,T}$ during the daytime at lower floor levels, reducing to approximately 63 dB $L_{Aeq,T}$ at higher floor levels. At the rear elevation screened from Cambridge Street, daytime façade noise impacts are not anticipated to exceed 62 $L_{Aeq,T}$ during the daytime.

Night-time $L_{Aeq,T}$ values at Cambridge Street are anticipated to be 2 to 3 dB lower than for daytime values.

4.2 Building envelope calculations

Calculation procedures follow the "more rigorous calculation method" outlined in BS 8233:2014

Within the vast majority of traditionally-built façades (which include masonry external walls and slate or tile roofs) the weakest elements of the external elevation are the glazing and any ventilation openings. Normally, the specification of these elements will be the primary factor in determining the internal ambient noise level within residential rooms due to noise ingress from outside. A copy of full detailed BS 8233 break-in calculations is available at request.

4.3 Glazing specification

Based on the varying noise impact across the site, it is suggested that up to three different acoustic performance 'conditions' for glazing could be specified, as indicated in Figure 3.

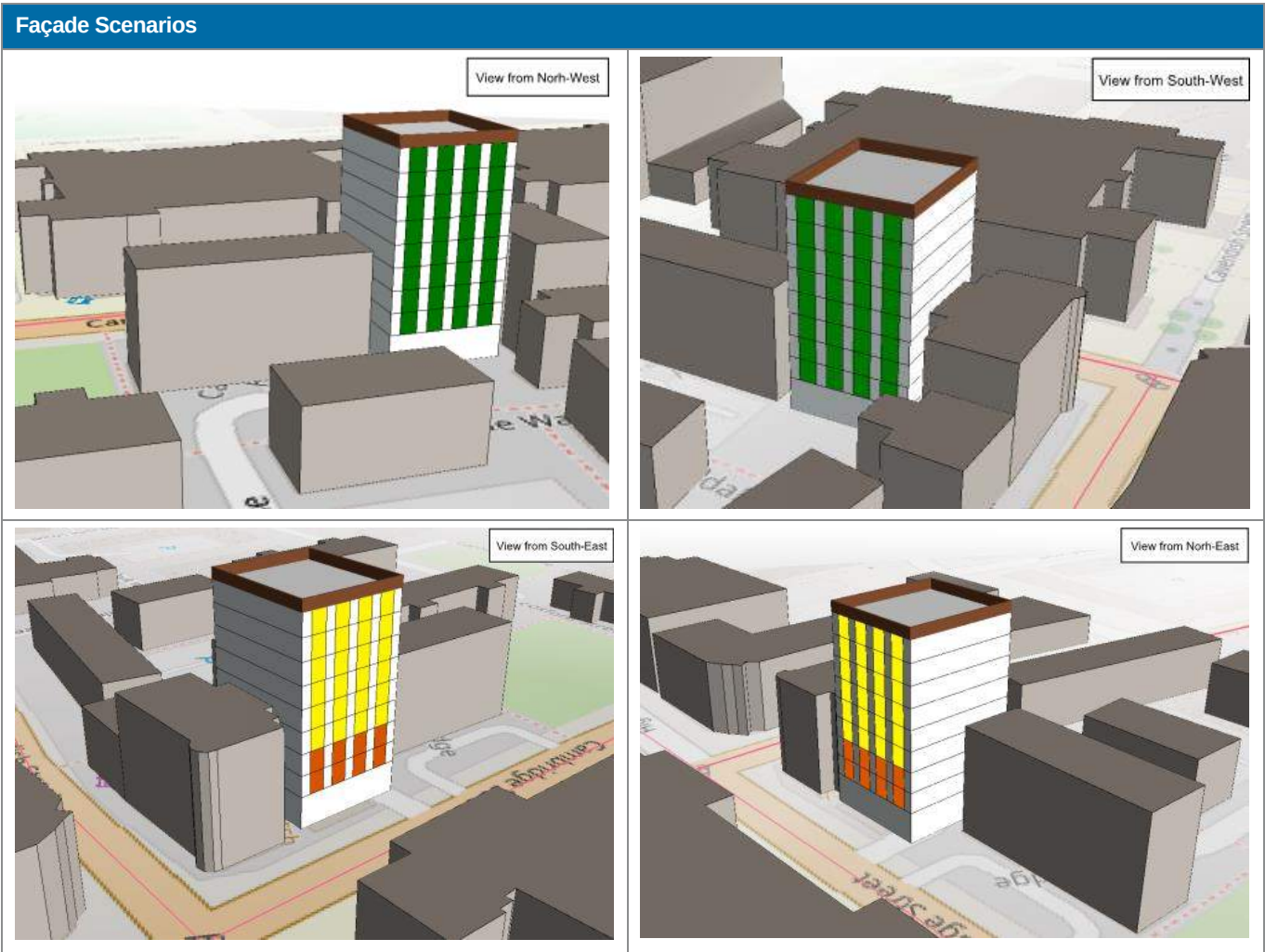


Figure 3 – Proposed façade conditions

Conditions have been defined based on the level of predicted night-time L_{Aeq} façade noise impact, as achieving the MCC night-time internal noise limit (≤ 30 dB L_{Aeq}) has been identified as the most onerous criterion and should see that all other design criteria should be achieved by default.

The corresponding minimum glazing and ventilation acoustic performance requirements for each 'condition' are presented in Table 3 overleaf.

Glazing 'Condition' reference	Night-time external façade noise level not exceeding (dB $L_{Aeq,8hours}$)	Required Sound Insulation (dB $R_w + C_{tr}$)	Assumed ventilation sound insulation rating* (dB $D_{n,e,w}$)	Example Glazing Specification
Condition 1	59	30	39	10 mm pane 6 to 20 mm air gap 4 mm pane This construction is rated $R_w + C_{tr}$ 30 dB by BS 12354
Condition 2	62	32	42	6 mm pane 12 mm air gap 6.4 mm SGG laminated pane This construction is rated $R_w + C_{tr}$ 32 dB by BS 12354
Condition 3	66	37	42	10 mm pane 12 mm air gap 8.4 mm SGG laminated pane This construction is rated $R_w + C_{tr}$ 37 dB by Pilkington
*Assumes one louvre per habitable room				

Table 3 – Proposed glazing and ventilation conditions

4.3.1 General glazing and ventilation notes

The following general recommendations are made for glazing and ventilation:

- The ventilation strategy should be capable of providing the background ventilation rates given in Part F of the Building Regulations. Calculations have been based upon providing a single acoustic louvre per room;
- Glazing and ventilation elements in the external facades are generally considered to be the weakest elements acoustically. To maintain the integrity of the external façade, particularly where very high levels of sound attenuation have been highlighted as being required (e.g. facades overlooking Cambridge Street), it will be necessary for the external wall construction to be carefully considered. Details of the external wall build-up should be forwarded to the project acoustician for review once available;
- For glazing specifications of 35 dB $R_w + C_{tr}$ and above, the manufacturer should provide evidence that the glazing **and frames** are capable of achieving the required sound insulation. BS 12354-3 suggests that for glazing attenuation requirements of 37 dB or less, the frames should have negligible impact on the overall performance of glazing and frame;
- To meet the requirements for purge ventilation, it should be acceptable to open windows. Purge ventilation, as described in Part F of the Building Regulations is 'intermittent, i.e. required only when such occasional activities occur.' Likely reasons for purge ventilation include the 'removal of high concentrations of pollutants and water vapour released from occasional activities such as painting and decorating or accidental releases such as smoke from burnt food or spillage of water.' During these short periods of time, increases in noise levels are considered acceptable.
- The cooling strategy will rely on open windows to control overheating. During periods when windows are open to provide relief from overheating, internal ambient noise levels exceed the proposed internal limits given in Table 1. For 'Condition 2' and 'Condition 3' facades, the level of exceedance will be significant. The magnitude of impact this will have on occupants will depend on the internal noise levels when windows are open and how often this will occur

(i.e. how often windows need to be open to help avoid overheating). As internal noise levels are likely to exceed normally recommended values in some rooms, where practically possible all attempts should be made to:

- Minimise the period of time windows are required to be open to provide relief from overheating; and
- Reduce internal noise levels when windows are open to provide relief from overheating.

5.0

External Plant Noise

5.0 External Plant Noise

As detailed in Section 2.6, Manchester City Council stipulate the following criteria with respect to noise emissions from new building services plant installations:

“Externally mounted ancillary plant, equipment and servicing shall be selected and/or acoustically treated in accordance with a scheme designed so as to achieve a rating level of 5 dB (L_{Aeq}) below the typical background (L_{A90}) level at the nearest noise sensitive location.”

5.1 Nearest noise sensitive receptors

The nearest noise-sensitive receptors to the proposed development are considered to be the Cambridge House and Manchester House apartment buildings.

5.2 Limiting noise levels

Table 4 below summarises the existing background noise levels measured at the site along with limiting noise levels for all new items of services plant (5dB below background), when measured at 1 m from the nearest noise sensitive receptor.

Time period	Existing background noise level* - L_{A90} (dB)	Plant noise rating level not to be exceeded at 1 m from nearest noise-sensitive receptor - $L_{A,T,r}$ (dB)
Daytime (07:00 – 23:00)	60	55
Night-time (07:00 – 23:00)	46	41
* Existing background noise value based on lowest measured $L_{A90,15min}$ value during attended noise surveys at MP2		

Table 4 – Limiting noise levels for services plant

The above limit is applicable to the cumulative noise level from all new items of plant when running under normal operation. Where applicable, acoustic feature corrections should be applied to the specific plant noise level to account for any distinguishable acoustic characteristics (e.g. tonality, impulsivity, intermittency).

6.0

Conclusions

6.0 Conclusions

Attended daytime and night-time noise surveys were undertaken at the site in order to assess the prevailing levels of environmental noise affecting the proposed development.

The noise levels impacting onto the new development have been calculated using 3D Acoustic Modelling software, and an assessment of the site has been made in accordance with Local and National Planning Policy.

Based on these predicted façade noise impacts, initial glazing and ventilation specifications have been suggested based on achieving internal ambient noise levels compliant with the Manchester City Council noise policy guidance.

Limiting noise levels have been provided for external noise impacts at existing nearby noise-sensitive receptors. A full review of potential building services noise impacts should be undertaken by the project Acoustician once plant selections have been finalised.

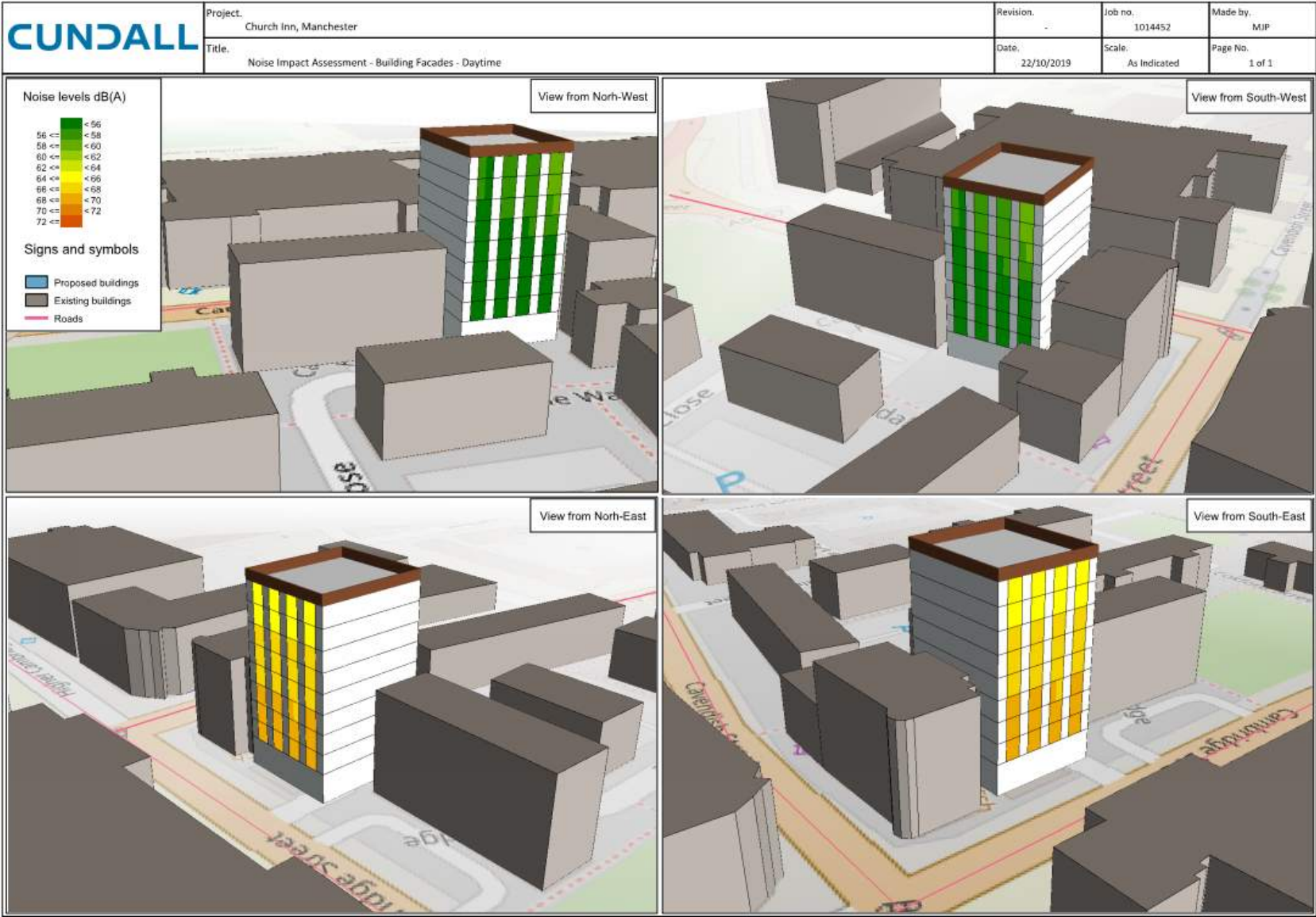
Appendices

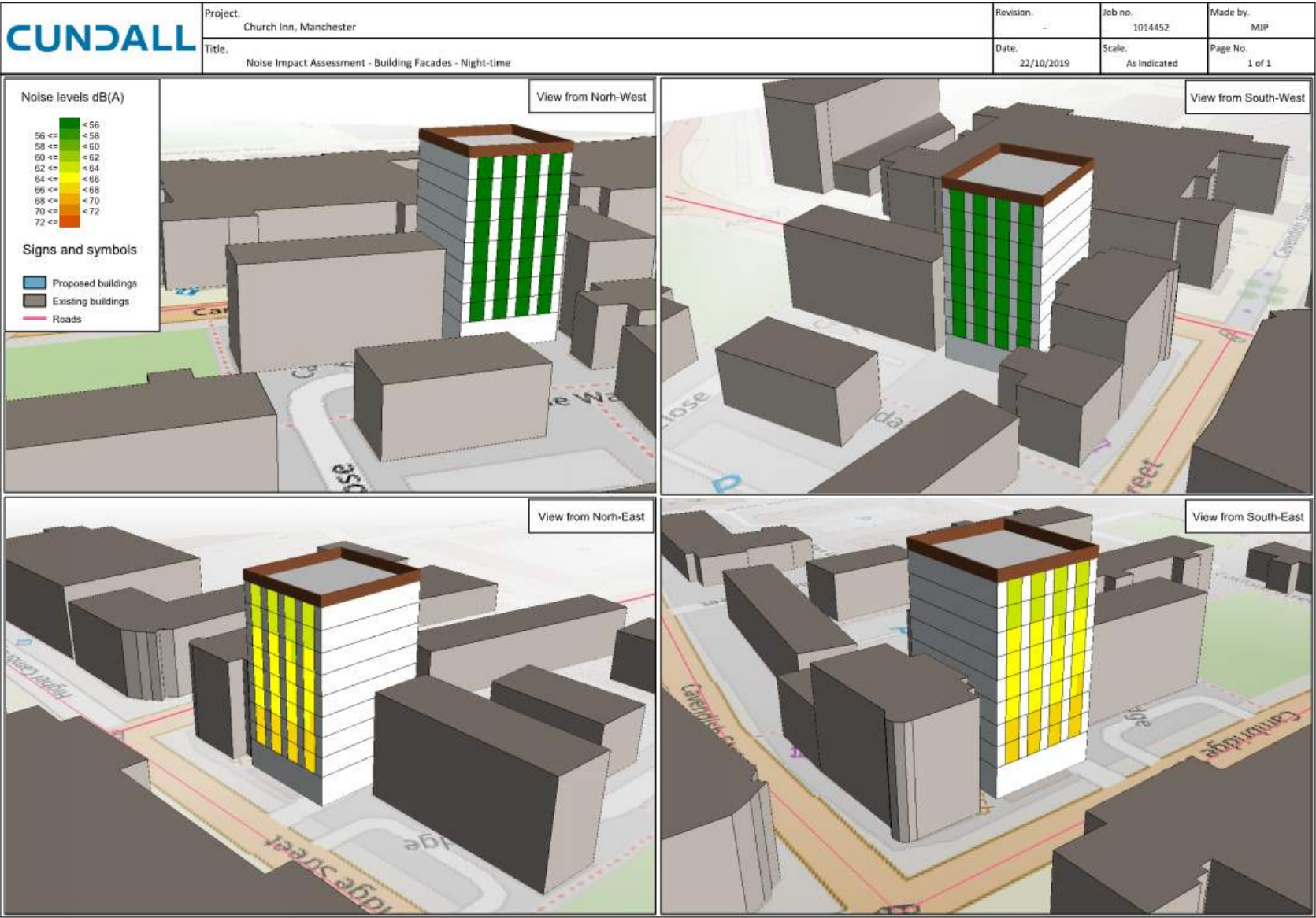
Appendix I Environmental Noise Data

Start date and time		Position	L _{Aeq}	L _{AFMax}	L _{A10}	L _{A90}
22/05/2018	23:00	1	67	81	71	58
22/05/2018*	23:15*		71*	97*	72*	58*
22/05/2018	23:30		66	78	70	57
22/05/2018	23:45		67	84	71	57
23/05/2018	00:00		67	81	71	57
23/05/2018	00:15		66	80	70	56
23/05/2018	00:41	2	54	70	57	49
23/05/2018	00:56		52	69	55	48
23/05/2018	01:11		51	65	54	47
23/05/2018	01:26		51	72	54	47
23/05/2018	01:41		52	73	55	47
23/05/2018	01:56		50	60	53	46
23/05/2018	06:00	1	67	82	71	60
23/05/2018	06:15		68	79	72	62
23/05/2018	06:30		69	86	73	63
23/05/2018	06:45		70	83	74	64
23/05/2018	07:00	1	70	81	74	64
23/05/2018	07:15		71	87	74	63
23/05/2018	07:30		70	80	74	63
23/05/2018	07:45		70	81	74	65
23/05/2018	08:00		70	80	74	63
23/05/2018	08:15		71	86	75	64
23/05/2018	08:30		70	81	74	63
23/05/2018	08:45		71	87	74	63
23/05/2018	09:00		71	80	75	64
23/05/2018	09:15		71	81	74	64
23/05/2018	09:41	2	59	67	60	57
23/05/2018	09:56	2	59	65	60	57
23/05/2018	10:11		63	70	67	57
23/05/2018	10:26		59	73	60	57
23/05/2018	10:41		58	70	60	57
23/05/2018	10:56		58	67	60	56

*Measurement excluded from analysis and calibration of 3D noise model due to erroneous noise from ambulance sirens

Appendix II Acoustic Façade Noise Model





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