

AVAL



Noise Impact Assessment

Site

310 Deansgate, Manchester M3 4HE

Client: Dahna Manchester

Project Information

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1. Introduction

1.1 Overview

Aval Consulting Group Ltd has been commissioned to carry out a noise assessment for the proposed changes at 310 Deansgate, Manchester, M3 4HE.

This report will investigate the noise levels from the proposed development. The main purpose of this report is to carry out a noise survey to determine if the noise impact from the proposed changes is likely to have a detrimental impact on the nearby receptors. The requirement of the planning conditions is a noise impact assessment to ensure that the noise emissions from the extraction system do not have a significant impact on local receptors. This has been assessed in accordance with BS4142: 2014 +A1 2019.

1.2 Site Location and Proposal Information

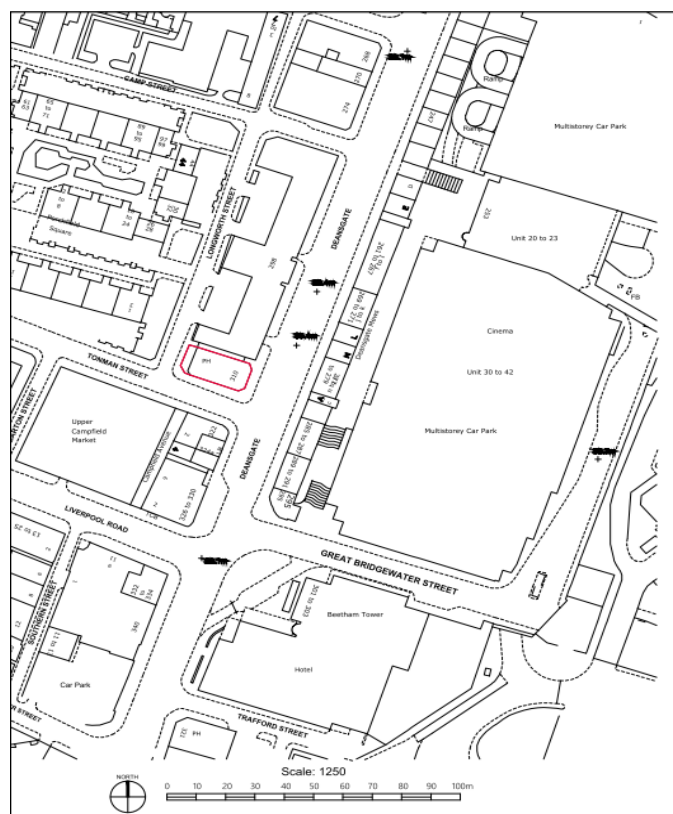
Figure 1.1 shows the proposed site location. The site is in question is located in the city centre and is bounded by Tonman Street to the South and by the A56 to the east. Commercial buildings are present to the North and further south of the development. It is also understood that an extension that involves an external roof-top seating area where smoking will be allowed is also part of the development. It is anticipated that no more than 40 people will be allowed in the smoking area at any point in time. Detailed drawings can be found in Appendix B

The most sensitive receptors have been identified as

- The residential units at around 25m from the site

It was also noted that the normal operating hours would be from 11.00 – 23.00

Figure 1-1 Proposed site location (Source: Client)



2. Relevant Noise Standards

This section summarises all legislation, policy, statutory and non-statutory guidelines relevant to the proposed development. Furthermore, the latest regional and local planning policy guidance specifically applicable to the proposed development has been reviewed.

2.1 The 'National Planning Policy Framework (NPPF)

The updated 2018/19 version of the 'National Planning Policy Framework (NPPF)'¹ contains information and general guidance to Local Authorities in relation to considering and taking into account noise. The National Planning Policy Framework (NPPF) guidance reinforces that noise should be taken into account considering planning policies and decisions. Some of the guidance contained in the 'National Planning Policy Framework (NPPF)' includes the following:

- Paragraph 170e: "...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..."
- Paragraph 180a,b: "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;..."
- Paragraph 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.

In conjunction with the 'National Planning Policy Framework (NPPF)', 'The Noise Policy Statement for England (NPSE)'², dated March 2010, states the following regarding a long-term vision of government noise policy:

"Noise Policy Statement for England Aims:

- *The first aim of the NPSE:*
Avoid significant adverse impacts on health and quality of life from environmental, neighbour, and neighbourhood noise within the context of Government policy on sustainable development.
- *The second aim of the NPSE:*
Mitigate and minimize adverse impacts on health and quality of life from environmental, neighbour, and neighbourhood noise within the context of Government policy on sustainable development.

¹ The National Planning Policy Framework (2018/19) <https://www.gov.uk/guidance/national-planning-policy-framework>

² Noise Policy Statement for England (NPSE) <https://www.gov.uk/government/publications/noise-policy-statement-for-england>

- The third aim of the NPSE:

Where possible, contribute to the improvement of health and quality of life through the effective management and control of environmental, neighbour, and neighbourhood noise within the context of Government policy on sustainable development.”

In terms of the NPSE, the impact of noise can be categorised by the following terms:

- NOEL – No Observed Effect Level – The level where no effect can be detected
- LOAEL – Lowest Observed Adverse Effect Level – The level where adverse effects on health and quality of life can be detected
- SOAEL – Significant Observed Adverse Effect Level – The level where significant adverse effects on health and quality of life may occur.

The NPSE further states that:

“It is not possible to have a single objective noise-based measure that defines SOAEL that is applicable to all sources of noise in all situations. Consequently, the SOAEL is likely to be different for different noise sources, for different receptors, and at different times.”

No specific guidance is detailed or given in the ‘National Planning Policy Framework (NPPF)’, or ‘The Noise Policy Statement for England (NPSE)’ in terms of acceptable acoustic criteria/noise criteria in order to achieve the ‘NOEL, LOAEL, or SOAEL’. Therefore, it is considered necessary to refer to alternate national guidance, preferably standardised or regulated such as an appropriate British Standard (BS), or in the absence of this, alternate World Health Organisation (WHO) guidelines, etc.

The British Standard 8223: Sound Insulation and Noise Reduction for Buildings/Code of Practice BS 8223: Sound Insulation and Noise Reduction for Buildings/Code of Practice states that for different spaces, there might be a range of noise levels that are considered acceptable.

2.2 WHO ‘Guidelines for Community Noise’

Where noise is assessed against the ‘Absolute Level’, then this can be split into separate daytime and night-time legislation. The WHO ‘Guidelines for Community Noise’ state in 4.2.7 “Annoyance Responses” that:

“During the daytime, few people are seriously annoyed by activities with L_{Aeq} levels below 55 dB; or moderately annoyed with L_{Aeq} levels below 50dB. Sound pressure levels during the evening and night should be 5-10 dB lower than during the day....”

The guidance goes on to provide a daytime³ internal acoustic criteria relative to critical health effect(s) that of 35 dB $L_{Aeq,16\text{ hour}}$, and a night-time⁴ level of 30 dB $L_{Aeq,8\text{ hour}}$ / 45 dB L_{AFmax} linked with dwelling indoors. Therefore, assuming a maximum external noise level of 50 dB $L_{Aeq,t}$ during the daytime, (considering a 15 dB reduction in noise via a partially open window) an internal noise level of 35 dB $L_{Aeq,t}$ should be achieved.

During the night-time periods, a further publication; WHO Night Noise Guidelines For Europe’ published in 2009 states that:

“Below the level of 30 dB $L_{night,outside}$, no effects on sleep are observed except for a slight increase in the frequency of body movements during sleep due to night noise. There is no sufficient evidence that the biological effects observed at the level below 40 dB $L_{night,outside}$ are harmful to health. However, adverse health effects are observed at the level above 40 dB $L_{night,outside}$, such as self-reported sleep disturbance, environmental insomnia, and increased use of somnifacient drugs and sedatives. Therefore, 40 dB $L_{night,outside}$ is equivalent to the LOAEL for night noise..... The LOAEL of night noise, 40 dB $L_{night,outside}$, can be considered a health-based limit value of the night noise guidelines (NNG) necessary to protect the public,

³ daytime is typically between 07:00 h and 23:00 h.

⁴ night-time is between 23:00 h and 07:00 h.

including most of the vulnerable groups such as children, the chronically ill and the elderly, from the adverse health effects of night noise.”

Therefore, where absolute levels need to be referenced, a maximum daytime noise limit of 50 dB $L_{Aeq,t}$ can be considered, with the LOAEL for night of 40 dB $L_{night,outside}$ being considered.

2.3 IEMA (Institute of Environmental Management & Assessment)

IEMA also defines the sensitivity of receptors according to the table below

Very Substantial	Greater than 10 dB L_{Aeq} change in sound level perceived at a receptor of great sensitivity to noise
Substantial	Greater than 5 dB L_{Aeq} change in sound level at a noise-sensitive receptor; or a 5 to 9.9 dB L_{Aeq} change in sound level at a receptor of great sensitivity to noise
Moderate	A 3 to 4.9 dB L_{Aeq} change in sound level at a sensitive or highly sensitive noise receptor; or a greater than 5 dB L_{Aeq} change in sound level at a receptor of some sensitivity
Slight	A 3 to 4.9 dB L_{Aeq} change in sound level at a receptor of some sensitivity
None/Not Significant	Less than 2.9 dB L_{Aeq} change in sound level and/or all receptors are of negligible sensitivity to noise or marginal to the zone of influence of the proposals

Table 2.1 Effect Descriptors (Guidelines For Environmental Noise Assessment, 2014)

2.4 The British Standard 8223: Sound Insulation and Noise Reduction for Buildings/Code of Practice

BS 8223: Sound Insulation and Noise Reduction for Buildings/Code of Practice provides acceptable noise levels. Table 4 of British Standard BS 8223 reproduced below (Table 2.1) provides appropriate criteria and limits for different situations, which are primarily intended to guide the design of new buildings or refurbished buildings undergoing a change of use, rather than to assess the effect of changes in the external noise climate.

Activity	Location	07:00 to 23:00 (Day Time)	23:00 to 07:00 (Night Time)
Resting	Living Room	35 dB $L_{Aeq, 16 \text{ hour}}$	-
Dinning	Dining Room/area	40 dB $L_{Aeq, 16 \text{ hour}}$	-
Sleeping (Daytime Resting)	Bedroom	35 dB $L_{Aeq, 16 \text{ hour}}$	30 dB $L_{Aeq, 8 \text{ hour}}$

Table 2.2: British Standard recommended indoor noise levels for dwellings (Source: British Standard BS: 8223)

In addition, the WHO Guidelines 1999 recommends that to avoid sleep disturbance, indoor night-time guideline noise values of 30 dB L_{Aeq} for continuous noise and 45 dB L_{AFmax} for individual noise events should be applicable. It is to be noted that the WHO Night Noise Guidelines for Europe 2009 makes reference to research that indicates sleep disturbance from noise events at indoor levels as low as 42 dB L_{AFmax} . The number of individual noise events should also be taken into account and the WHO guidelines suggest that indoor noise levels from such events should not exceed approximately 45 dB L_{AFmax} more than 10 – 15 times per night. The WHO document recommends that steady, continuous noise levels should not exceed 55 dB L_{Aeq} on balconies, terraces, and outdoor living areas. It goes on to state that to protect the majority of individuals from moderate annoyance, external noise levels should not exceed 50 dB L_{Aeq} .

BS 8223 also states that the ambient noise levels in non-domestic buildings should not normally exceed the design ranges in the table below.

Activity	Location	Design Range dB L _{Aeq,T}
Speech or telephone communications	Department store, Cafeteria, canteen, Kitchen	50-55
	Concourse Corridor, circulation space	45-55
Study and work requiring concentration	Library, gallery, museum	40-50
	Staff/meeting room, training room	35-45
	Executive office	35-40
Listening	Place of worship, counselling, meditation, relaxation	30-35

Table 2.2: Typical Noise levels in non-Domestic Buildings (Source: British Standard BS: 8223)

2.5 BS 4142: 2014; Methods for rating and assessing industrial and commercial sound

In terms of industrial/commercial development, guidance is set out in BS 4142: 2014, 'Methods for rating and assessing industrial and commercial sound'. BS 4142 requires the noise from the process/equipment (in L_{Aeq}) to be compared with the background sound level (L_{A90}) in conjunction with the new noise source.

BS 4142 states that if the rated noise level exceeds the L_{A90} background sound level by around +10 dB or more, then it is likely that the resultant noise may have a significant adverse impact, a difference of around +5 dB over the background sound level is likely to have an adverse impact, and where the rating level does not exceed the background sound level it is an indication that the resultant noise is likely to have a low adverse impact.

BS 4142: 2014 provides a method for assessing whether an industrial or commercial sound source (e.g. fixed mechanical plant) is likely to cause a disturbance to persons living near to the sound source.

The 2014 document introduces three main acoustic features:

- **Tonality:** Defined as more sound in the 1/3 octave band than those nearby 1/3 octave bands or more sound in a given frequency than in those nearby frequencies. The tonality feature correction +6dB and can be applied using subjective method or an objective method using 1/3 octave bands.
- **Impulsivity:** defined as sound that increases by a rate of at least 10dB per second, regardless of its duration. The impulsivity feature correction range from 0-9 dB and can be applied using a subjective method or an objective method using a sound level meter capable of sampling sound at either once every 0.01s interval or once every 0.025s interval.
- **Intermittency:** Defined as sound that can be identified as being on/off during the measurement period in which case the correction factor that is applied to the specific sound source (e.g. fume extraction system) is +3 DB.

BS 4142 assesses potential significant effect by comparing the source noise (extractor duct vent noise) with the measured background noise level (L_{A90}). The standard provides a penalty (correction factor) for acoustic features for instance bangs or tonal qualities that can increase the likelihood of noise complaints and in these cases, the standard requires a

correction to be added to the source noise level. The source noise level along with the correction factor is referred to as the 'rating level'. The rating level is then compared with the background level (La90). BS 4142:2014 advocates the use of LAeq,T - a level, which is directly measurable and termed the Specific Sound Level.

- Subjectively the Specific Sound Level may be corrected as follows:

The Specific Sound Level is subject to a correction for tonality between 0dB to +6dB for sound ranging from not tonal to prominently tonal. Subjectively, this can be converted to a penalty of 2dB for a tone which is just perceptible at the noise receptor, 4 dB where it is clearly perceptible, and 6dB where it is highly perceptible.

The Specific Sound Level may be also corrected to impulsivity. A correction of up to +9dB can be applied for sound that is highly impulsive, considering both the rapidity of the change in sound level and the overall change in sound level. Subjectively, this can be converted to a penalty of +3dB for impulsivity which is just perceptible at the noise receptor, 6dB where it is clearly perceptible, and 9dB where it is highly perceptible.

Other sound characteristics that are neither tonal nor impulsive, though otherwise are readily distinctive against the residual acoustic environment, can have a penalty of 3dB applied.

Where tonal and impulsive characteristics are present in the specific sound within the same reference period then these two corrections can both be taken into account. If one feature is dominant then it might be appropriate to apply a single correction. Where both features are likely to affect perception and response, the corrections ought normally to be added in a linear fashion.

Further corrections may be applied due to intermittency. When the specific sound has identifiable on/off conditions, the specific sound level ought to be representative of the time period of length equal to the reference time interval which contains the greatest total amount of on time. This can necessitate measuring the specific sound over a number of shorter sampling periods that are in combination less than the reference time interval in total, and then calculating the specific sound level for the reference time interval allowing for time when the specific sound is not present. If the intermittency is readily distinctive against the residual acoustic environment, a penalty of 3dB can be applied.

If the subjective method is not sufficient for assessing the audibility of tones in sound or the prominence of impulsive sounds, BS4142:2014 suggests using the one-third octave method and/or the reference methods, as appropriate.

The one-third octave method tests for the presence of a prominent, discrete-frequency spectral component (tone) typically compares the LZeq,T sound pressure level averaged over the time when the tone is present in a one-third-octave band with the time-average linear sound pressure levels in the adjacent one-third-octave bands. For a prominent, discrete tone to be identified as present, the time-averaged sound pressure level in the one-third-octave band of interest is required to exceed the time-averaged sound pressure levels of both adjacent one-third-octave bands by some constant level difference. The level differences between adjacent one-third-octave bands that identify a tone are:

- 15 dB in the low-frequency one-third-octave bands (25Hz to 125Hz);
- 8 dB in the middle-frequency one-third-octave bands (160Hz to 400Hz); and
- 5 dB in the high-frequency one-third-octave bands (500Hz to 10,000Hz).

- The reference (objective) method.

If the presence of audible tones is in dispute, a special measurement procedure can be used to verify their presence. Based on the prominence of the tones this procedure also provides recommended level adjustments. The aim of the reference method is to assess the prominence of tones in the same way as listeners do on average. The method is based on the psychoacoustic concept of critical bands, which are defined so that sound outside a critical band does not contribute significantly to the audibility of tones inside that critical band. The method includes procedures for steady and varying tones, narrow-band sound and low-frequency tones, and the result is a graduated 0dB to 6dB adjustment. It is known as the Joint

Nordic Method 2 and is to be found in ISO 1996-2. The reference method is also described in BS4142:2014.

Specific Sound Level with (or without) added contentions is termed the Rating Level. When used to assess industrial or commercial sound, the Rating Level is determined and the LA90 background level is subtracted from it. Typically, the greater this difference, the greater the magnitude of the impact.

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.

In addition to above, based on the Guidance of Control of Odour and Noise from Commercial Kitchen Exhaust Systems (2018), there are two fundamental categories of noise source are of relevance. The first is the noise produced by the fan, which is a function of the type of fan (axial, centrifugal, mixed flow, etc), the rate of the airflow and the pressure drop. For these calculations, the octave band sound power from the fan is required. This can normally be obtained from the manufacturer.

The second category of noise is generated by turbulence as the air passes within the ducts or through the exit grille or louver. In this case, the amount of noise is determined by the design of duct, grille, or louver, the pressure drop across terminations, the velocity of the air (this can be variable across the duct, grille, or louver) and the area of the duct or opening. The problem with this form of noise, especially at terminations, is that in most situations it can only be controlled at its source. For example, at the feature that is generating the noise as there is no further length of duct in which to install noise control equipment.

In some situations, a third source may need to be considered. This is where noise generated within the building breaks into the ductwork and is radiated from the outlet. The area of the duct walls, the acoustic properties of the duct walls, and the area of any inlets determine the amount of break-in noise. Once this noise has broken into the ducts it can be treated as if it were an additional component of the fan noise. However, the nature of this additional noise is such that it usually contains a relatively high level of low-frequency sound which can be difficult to attenuate.

The attenuation of fan noise (and break-in noise) provided by the ductwork is determined by the length of the ducts, the presence of any bends, changes in cross-section, the presence of any plenum chambers and termination effects (including sound-attenuating louvers if present and the attenuation provided by any change in cross-section). A balance has to be struck between the acoustic benefit of bends and louvers etc and the pressure drop that these create, possibly requiring a larger fan.

The sound energy components arising from fan noise, turbulence within the duct and at outlets, and from noise break-in, combine to produce an acoustic source at the outlet. The energy will then propagate away from the outlet in a manner determined by the nature and geometry of surrounding buildings and terrain. The nature, temporal characteristic and level of the resultant sound that reaches the ears of people in the vicinity (usually quantified by considering the noise at façades), and its level relative to the background noise, all contribute to its potential to cause disturbance and complaint. These factors should be taken into account at the planning stage as a matter of course. They form the basis of BS 4142 "Rating industrial noise affecting mixed residential and industrial areas" which is also used by Local Authority as support to the issue of a Noise Abatement Notice under the Environmental Protection Act.

2.6 Noise at Work 2005

For new premises or premises covered by planning conditions restricting the impact of noise the system shall be designed to prevent an acoustic impact on the external environment and therefore harm to the amenity, as well as ensuring that noise exposure of kitchen staff does not constitute an occupational noise problem (see Control of Noise at Work Regulations 2005).

The lower exposure action values are

- (a) a daily or weekly personal noise exposure of 80 dB (A-weighted); and
- (b) a peak sound pressure of 135 dB (C-weighted).

The upper exposure action values are

- (a) a daily or weekly personal noise exposure of 85 dB (A-weighted); and
- (b) a peak sound pressure of 137 dB (C-weighted).

The exposure limit values are

- (a) a daily or weekly personal noise exposure of 87 dB (A-weighted); and
- (b) a peak sound pressure of 140 dB (C-weighted).

Where the exposure of an employee to noise varies markedly from day to day, an employer may use weekly personal noise exposure in place of daily personal noise exposure for the purpose of compliance with these Regulations.

3. Noise Survey

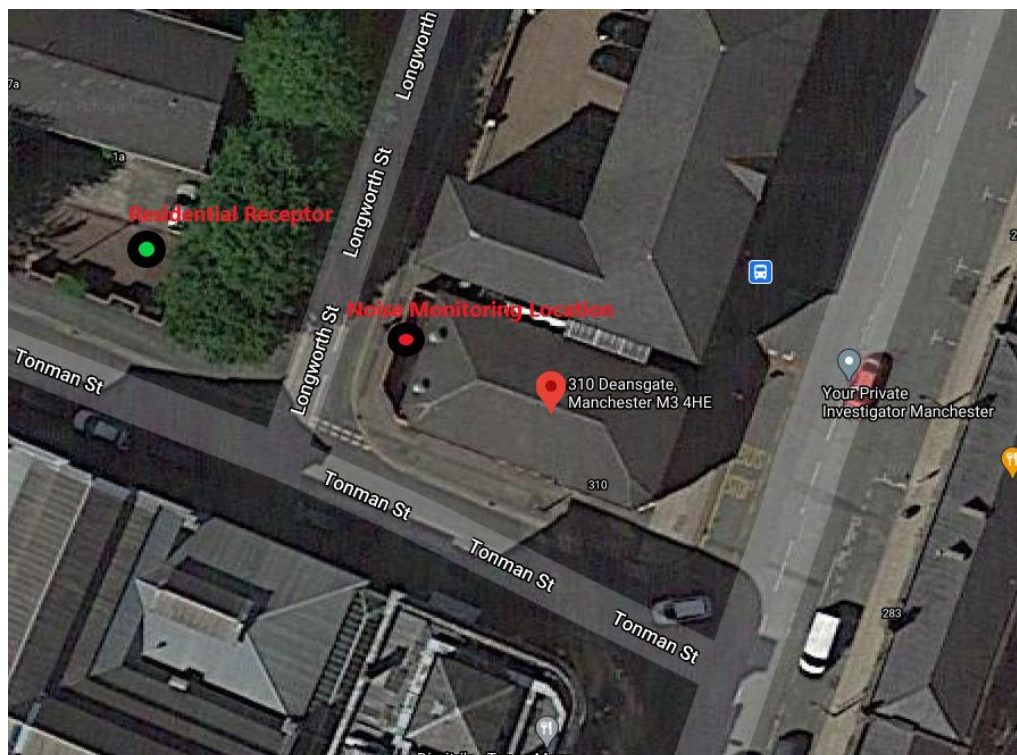
3.1 Overview

This section provides the details of the methodological approach taken to assess the prevailing acoustic environment at the site where existing noise-sensitive receptors will be present. Establishing the current acoustic environment requires the monitoring of noise levels at the site and where applicable establishes the key noise indicators namely L_{AeqT} , L_{A10T} , L_{A90} , T , and $L_{Amax,T}$ as described in Appendix A.

3.2 Noise Monitoring Location

Noise, for the specific site, was monitored at the location shown in figure 3.1 below. The noise monitoring was carried out in a strategic location where prevailing background noise levels could be measured. The choice of location was also influenced by it being more secure than the open areas.

Figure 3.1 Location of Noise Monitoring



3.3 Noise Survey Periods

The noise survey was carried out for a period of 24 hours and noise levels were recorded at 1min intervals. Details of the survey periods have been tabulated below.

Table 3.2 Noise Survey Periods

Measurement Location	Start Date	Start Time	End Date	End Time
1	09/02/21	11.00	10/02/21	11.00

3.4 Details of Noise Monitoring Equipment

The details of the equipment used for noise monitoring have been tabulated below. Please note that all equipment are class 1 monitors and are calibrated before and after surveys.

Table 3.3 Noise Equipment Details

Equipment	Serial Number	Last Calibration Date
B&K 2250	3000701	08 July 2020

3.5 Weather Conditions and observations

The following climate conditions were recorded for the site:

Wind: Less than 3 m/s.

Humidity: The weather was clear.

Temperature: 7-15 Degrees C.

Precipitation: None

The above weather conditions are suitable for the measurement of environmental noise in accordance with BS7445: Description and Measurement of Environmental Noise.

During the measurement of prevailing background levels, it was observed that the area could have been a bit more quiet than usual because of the COVID-19. However, it is considered that this would affect the BS4142 survey in a positive way and in turn allow for robust mitigation measures.

4. Noise Survey Results

4.1 Noise from Proposed Equipment

As it is understood, the existing equipment consists of 2 extractor fans located at the first-floor level as well as a cooling unit and an air intake unit and already benefits from planning permission. However, this has still been considered as part of the overall impact. The details of the noise emissions from the existing equipment have been presented in the table below and have been obtained from the manufacturers. A penalty of 3dB has also been applied for intermittence as per BS4142 (see section 2) where required. BS8233 states that a raised voice emits a noise level of 62dB. Assuming 40 people are on the rooftop extension with raised voices, the noise levels would sum up to 58dB. These noise levels as well as the existing attenuation levels from screens/attenuators have been also considered and the rating levels are presented in the table below.

Table 4.1 Details and Noise emissions of proposed equipment

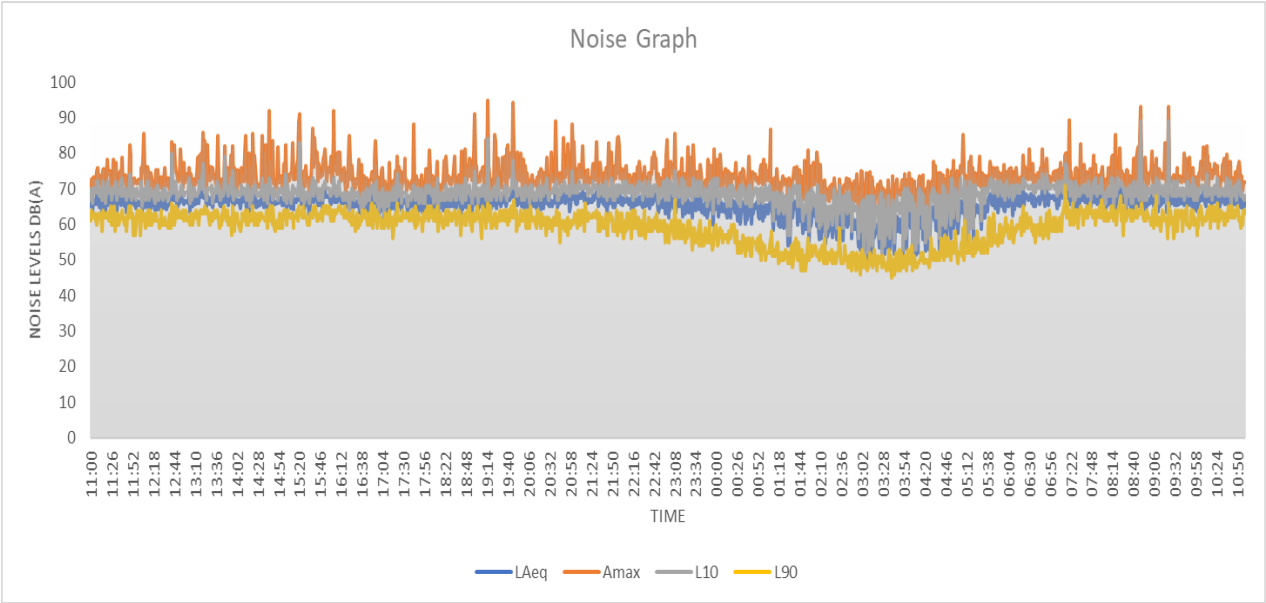
Noise Source	Specific Sound Level/attenuation dB (A)	Acoustic Feature Correction dB (A)	Existing Attenuation Levels dB	Rating Levels dB(A)
Cellar Cooling Condenser	69	-	-10	59
Kitchen Canopy Extract	69	3	-5	67
Kitchen fresh air inlet	65	-	-5	60
Extract Fan 1	65	3	-5	63
Extract Fan 2	65	3	-5	63
Roof top Extension	58	-	-	58

4.2 Background noise levels

The results of the background noise monitoring (also see Section 3) have been summarised below.

Table 4.2 Summary of Noise Monitoring results

	Noise Indicator	Noise Monitoring Location 1 All values are in dB(A)
Daytime (07.00-23.00)	L_{Aeq}	68
	L_{A90}	62
	L_{Amax}	95
Night-time (23.00-07.00)	L_{Aeq}	64
	L_{A90}	56
	L_{Amax}	87



5. Noise Impact Assessment

Referring to section 4 of this report, the impact of the predicted noise levels from the proposed development was compared to the prevailing background noise levels and this has been elaborated on below.

The noise levels generated by all the equipment (presented in table 4.1) have been rated and penalised for acoustic feature corrections according to BS4142.

A distance correction factor has been considered to estimate the noise impact at the most sensitive receptor, which is estimated at a distance of 25 m. The following equation was used:

$$\text{Equation 1: } \text{SPL}_2 = \text{SPL}_1 - 20\log(r_2/r_1),$$

Where, r_2 is the receiver distance,

r_1 is the measurement distance,

SPL_1 is the noise level at r_1 and

SPL_2 is the noise level at the new receiver location

The noise impact levels estimated at the most sensitive receptor have been tabulated below:

Table 5.1 Noise Impact levels at nearest receptor

Equipment Details	Rating Levels dB (A)	Distance from receptor in metres	Noise Impact level at receptor after distance correction factor dB (A)
Cellar Cooling Condenser	59	25	31
Kitchen Canopy Extract	67	35	33
Kitchen fresh air inlet	60	25	32
Extract Fan 1	63	30	30
Extract Fan 2	63	38	28
Noise from rooftop extension	58	25	30
Total Noise level			39

Comparing the total noise emission levels from the development (above table) to the lowest recorded background level (night-time of 56dB) from section 4 of this report, it was found that the noise emission levels from the development is 17dB below prevailing background levels and is therefore considered as insignificant.

6. Mitigation

In regard to the previous section of this report, it is understood that the extraction fan will be fitted with an acoustic fan jacket and as per the calculations in Section 5 of this report, no further mitigation is deemed necessary.

7. Conclusions

This report provides an assessment of the potential noise impact from all the external equipment related to the proposed changes at 310 Deansgate, Manchester M3 4HE, to fulfil the planning requirements.

Noise Surveys were undertaken to determine prevailing noise levels on-site and a noise impact assessment was made to determine how the proposed development would affect nearby residential amenity.

Based on the results presented in section 5 of this report and the proposed equipment, no mitigation measures were deemed necessary.

It can, therefore, be concluded that the proposed development is not considered to conflict with any national, regional, or local planning policy in relation to operational phase noise impact on existing receptors.

Appendix A: Noise Indicators

Decibel scale - dB

In practice, when sound intensity or sound pressure is measured, a logarithmic scale is used in which the unit is the 'decibel', dB. This is derived from the human auditory system, where the dynamic range of human hearing is so large, in the order of 10^{13} units, that only a logarithmic scale is the sensible solution for displaying such a range.

Decibel scale, 'A' weighted - dB(A)

The human ear is less sensitive at frequency extremes, below 125Hz and above 16Khz. A sound level meter models the ears variable sensitivity to sound at different frequencies. This is achieved by building a filter into the Sound Level Meter with a similar frequency response to that of the ear, an A-weighted filter where the unit is dB(A).

Octave Bands

In order to completely determine the composition of a sound it is necessary to determine the sound level at each frequency individually. Usually, values are stated in octave bands. The audible frequency region is divided into 11 such octave bands whose centre frequencies are defined in accordance with international standards. These centre frequencies are: 16, 31.5, 63, 125, 250, 500, 1000, 2000, 4000, 8000 and 16000 Hertz.

Reference Time Interval, T

The specified time interval over which an equivalent continuous A-weighted sound pressure level is determined.

$L_{Aeq,T}$

The A-weighted equivalent continuous sound level. This is the sound level of a notionally steady sound having the same energy as the fluctuating sound over a specified measurement period, T.

$L_{A10,T}$

The A-weighted sound level exceeded for 10% of the specified measurement period, T.

L_{Amax}

The highest short duration A-weighted sound level recorded during a noise event.

L_{A90}

The A-weighted sound pressure level of the residual noise at the assessment position that is exceeded for 90 % of a given time interval, T.

Addition of noise from several sources

Noise from different sound sources combines to produce a sound level higher than that from any individual source. Two equally intense sound sources operating together produce a sound level which is 3dB higher than a single source and 4 sources produce a 6dB higher sound level.

Attenuation by distance

Sound which propagates from a point source in free air attenuates by 6dB for each doubling of distance from the noise source. Sound energy from line sources (e.g. stream of cars) drops off by 3dB for each doubling of distance.

Subjective impression of noise

Hearing perception is highly individualised. Sensitivity to noise also depends on frequency content, time of occurrence, duration of sound and psychological factors such as emotion and expectations. The following table is a guide to explain increases or decreases in sound levels for many scenarios.

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible

6	Clearly noticeable
10	About twice as loud

Transmission path(s)

The transmission path is the path the sound takes from the source to the receiver. Where multiple paths exist in parallel, the reduction in each path should be calculated and summed at the receiving point. Outdoor barriers can block transmission paths, for example traffic noise. The effectiveness of barriers is dependent on factors such as its distance from the noise source and the receiver, its height and construction.

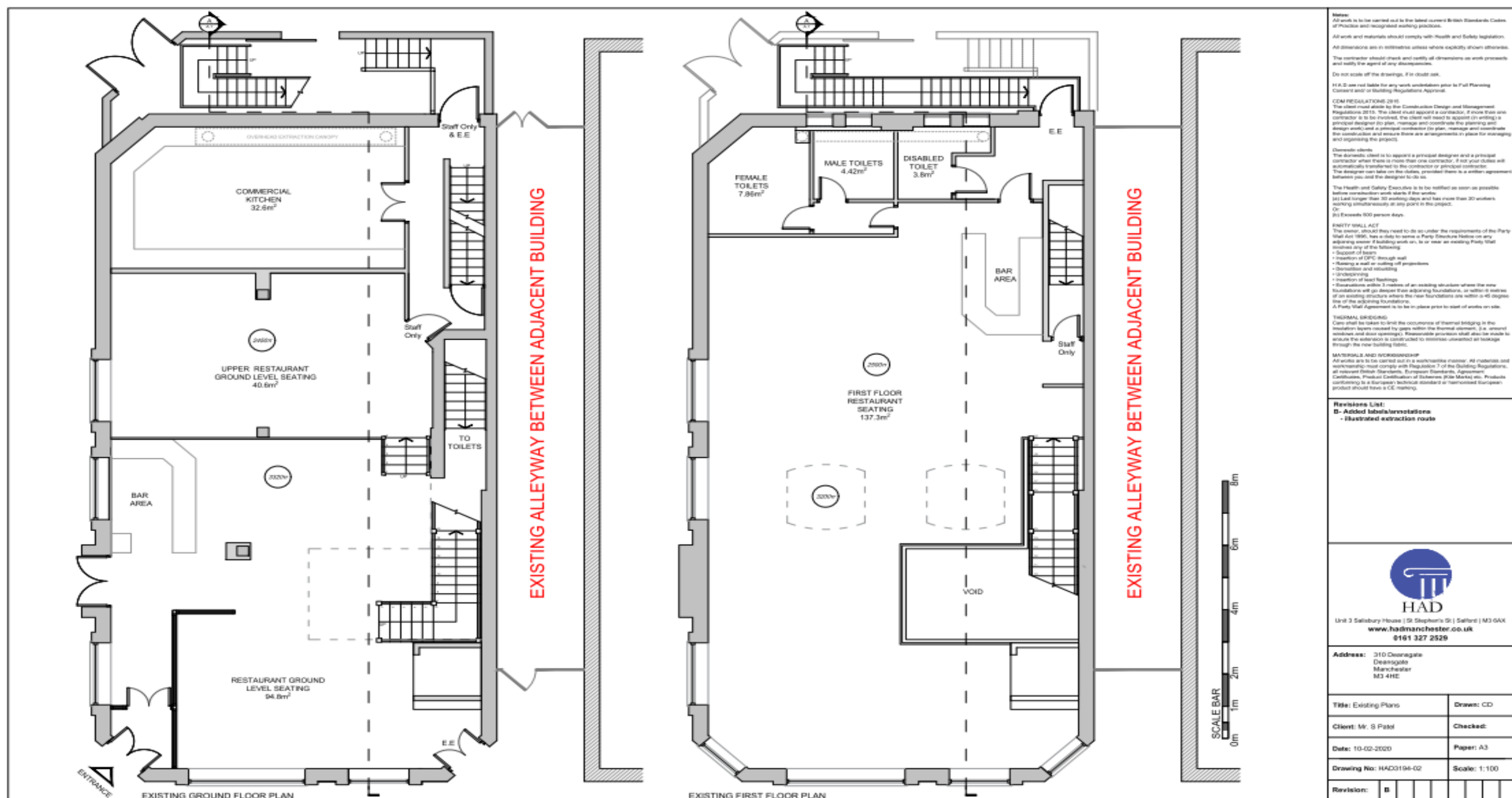
Ground-borne vibration

In addition to airborne noise levels caused by transportation, construction, and industrial sources there is also the generation of ground-borne vibration to consider. This can lead to structure-borne noise, perceptible vibration, or in rare cases, building damage.

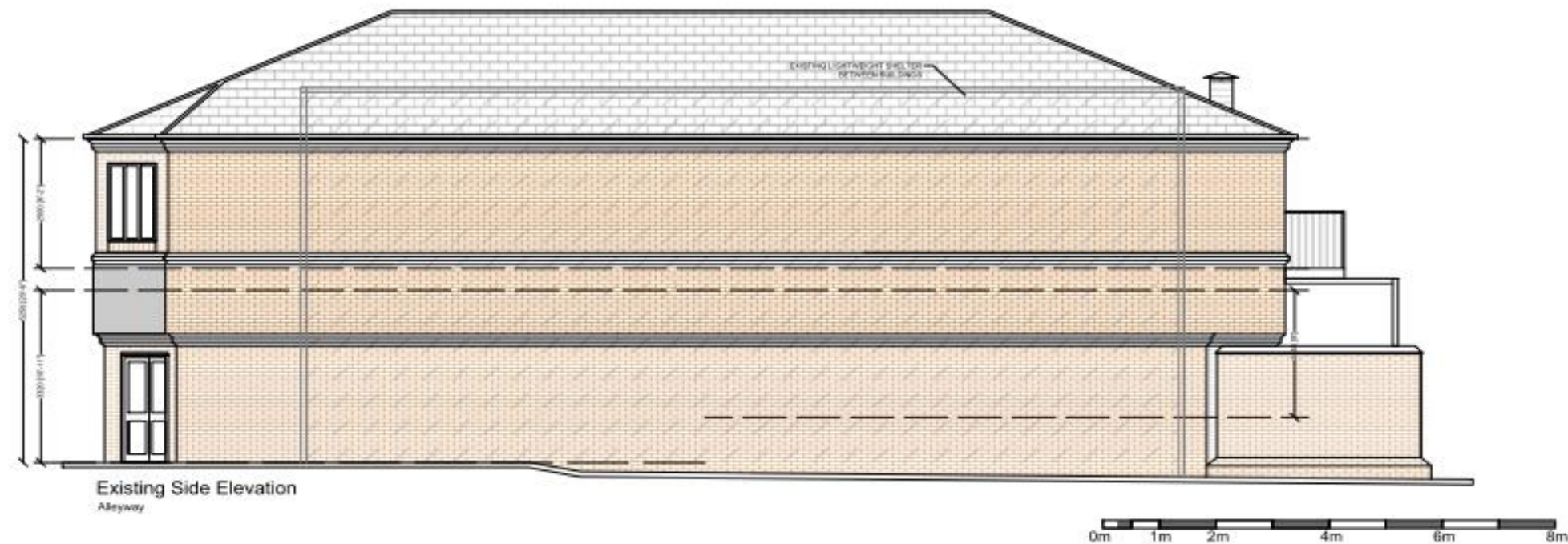
Sound insulation - Absorption within porous materials

Upon encountering a porous material, sound energy is absorbed. Porous materials which are intended to absorb sound are known as absorbents, and usually absorb 50 to 90% of the energy and are frequency dependent. Some are designed to absorb low frequencies, some for high frequencies and more exotic designs being able to absorb very wide ranges of frequencies. The energy is converted into both mechanical movement and heat within the material; both the stiffness and mass of panels affect the sound insulation performance.

Appendix B: Site Drawings







Notes:
All work is to be carried out to the latest current British Standards Codes of Practice and recognised working practices.
All work and materials should comply with Health and Safety legislation.
All dimensions are in millimetres unless stated otherwise.
The contractor should check and verify all dimensions on work presented and notify the agent of any discrepancies.
Do not scale off the drawings, if in doubt ask.
H.A.S. are not liable for any work undertaken prior to Full Planning Consent and/or Building Regulations Approval.

CDM REGULATIONS 2015:
The client must appoint a Principal Designer and Management Regulations 2015. The client must appoint a contractor, if more than one contractor is to be involved, the client will need to appoint (or acting) a principal designer to plan, manage and coordinate the planning and design work and a principal contractor to plan, manage and coordinate the construction and ensure there are arrangements in place for managing and organising the project.

Domestic clients:
The domestic client is to appoint a principal designer and a principal contractor when there is more than one contractor. If not your duties will automatically transfer to the contractor or principal contractor.
The designer can take on the duties, provided there is a written agreement between you and the designer to do so.
The Health and Safety Executive is to be notified as soon as possible before construction work starts if the work:
(a) Last longer than 30 working days and has more than 30 workers working simultaneously at any point in the project.
Or:
(b) Exceeds 500 person days.

PARTY WALL ACT:
The owner should first need to be in order the requirements of the Party Wall Act 1999, has a duty to serve a Party Structure Notice on any adjoining owner if building work on, to or near an existing Party Wall involves any of the following:
• Support of beams
• Insertion of DPC through wall
• Raising a wall or cutting off projections
• Demolition and rebuilding
• Underpinning
• Insertion of steel beams
• Excavations within 3 metres of an existing structure where the new foundations will go deeper than existing foundations, or within 6 metres of an existing structure where the new foundations are within a 60 degree line of the existing foundations.
A Party Wall Agreement is to be in place prior to start of works on site.

THERMAL BRIDGING:
Care shall be taken to limit the occurrence of thermal bridging in the insulation layers caused by gaps rather than thermal element, i.e. around windows and door openings. Remediable provision shall also be made to ensure the exterior is constructed to minimise unwanted air leakage through the new building fabric.

MATERIALS AND WORKMANSHIP:
All work is to be carried out in a workmanlike manner. All materials and workmanship must comply with Regulation 7 of the Building Regulations, all relevant British Standards, European Standards, Agreement Certificates, Product Certification of Suppliers (Kitemark) etc. Products conforming to a European technical standard or harmonised European product should have a CE marking.

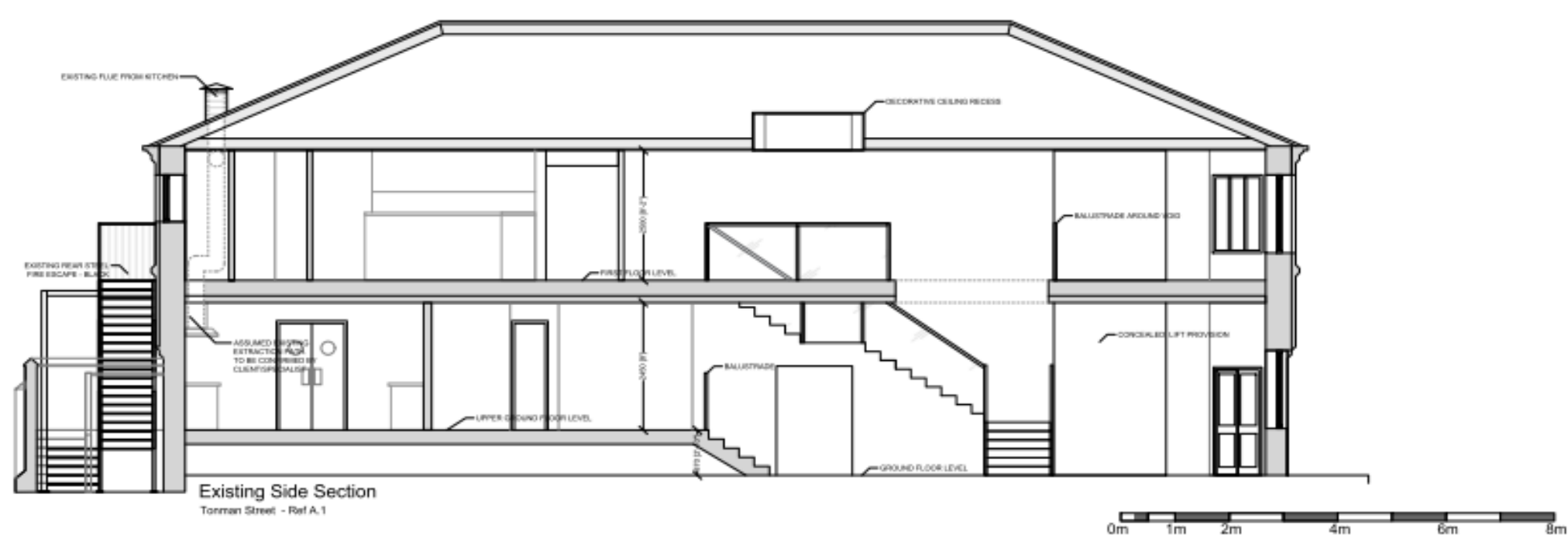
Revisions List:
B- Added labels/annotations



HAD
Unit 3 Salisbury House | St. Stephen's Dr | Salford | M3 6AN
www.hadmanchester.co.uk
0161 327 2529

Address: 310 Deansgate
Deansgate
Manchester
M3 4HE

Title: Existing Elevations	Drawn: CD										
Client: Mr. S Patel	Checked:										
Date: 10-02-2020	Paper: A3										
Drawing No: HAD0194-04	Scale: 1:100										
Revision:	<table><tr><td>B</td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr></table>	B									
B											



Notes:
All work is to be carried out to the latest current British Standards Codes of Practice and recognised working practices.

All work and materials should comply with Health and Safety legislation.
All dimensions are in millimetres unless where explicitly shown otherwise.

The contractor should check and verify all dimensions on work previously and verify the agreed on any discrepancies.

H.R.D. are not liable for any work undertaken prior to Full Planning Consent and/or a Building Regulations Approval.

CDM REGULATIONS 2015:
The client must abide by the Construction Design and Management Regulations 2015. The client must appoint a contractor, if more than one

contractor is to be involved, the client will need to appoint (in writing) a principal designer (to plan, manage and coordinate the planning and design work) and a principal contractor (to plan, manage and coordinate the construction and ensure there are arrangements in place for managing and organising the project).

Domestic clients
The domestic client is to appoint a principal designer and a principal contractor when there is more than one contractor, if not your duties will automatically transfer to the contractor or principal contractor.

The designer can take on the clubs, provided there is a written agreement between you and the designer to do so.

(a) Last longer than 30 working days and has more than 20 workers working simultaneously at any point in the project.

PARTY SHALL ACT
This manner, when it has caused to do so under the provisions of the Zurich

Wall Act 1996, has a duty to serve a Party Structure Notice on any adjoining owner if building work on, in or near an existing Party Wall involves any of the following:

- Insertion of OPC through wall
- Flaming a wall or cutting off projections
- Demolition and rebuilding
- Underpinning

- Excavations within 3 metres of an existing structure where the new foundations will go deeper than adjoining foundations, or within 6 metres of an existing structure where the new foundations are within a 60 degree

A Party Wall Agreement is to be in place prior to start of works on site.

Care shall be taken to limit the occurrence of thermal bridging in the insulation layers caused by gaps within the thermal element, (i.e. around windows and door openings). Reasonable provision shall also be made to ensure the exterior is constructed to minimise unwanted air leakage.

MATERIALS AND WORKMANSHIP
All work was to be carried out in a workmanlike manner. All materials and

workmanship must comply with Regulation 7 of the Building Regulations, all relevant British Standards, European Standards, Agreement Certificates, Product Certifications of Suppliers (Kitemark) etc. Products contributed by a Contractor, Technical Consultant or subcontracted Specialist

Manufacturer's list:

TABLE 1
continued

11

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Address: 310 Deargate
Dunsmuir

Manchester
M3 4HE

Title: Existing Section	Drawn: CD
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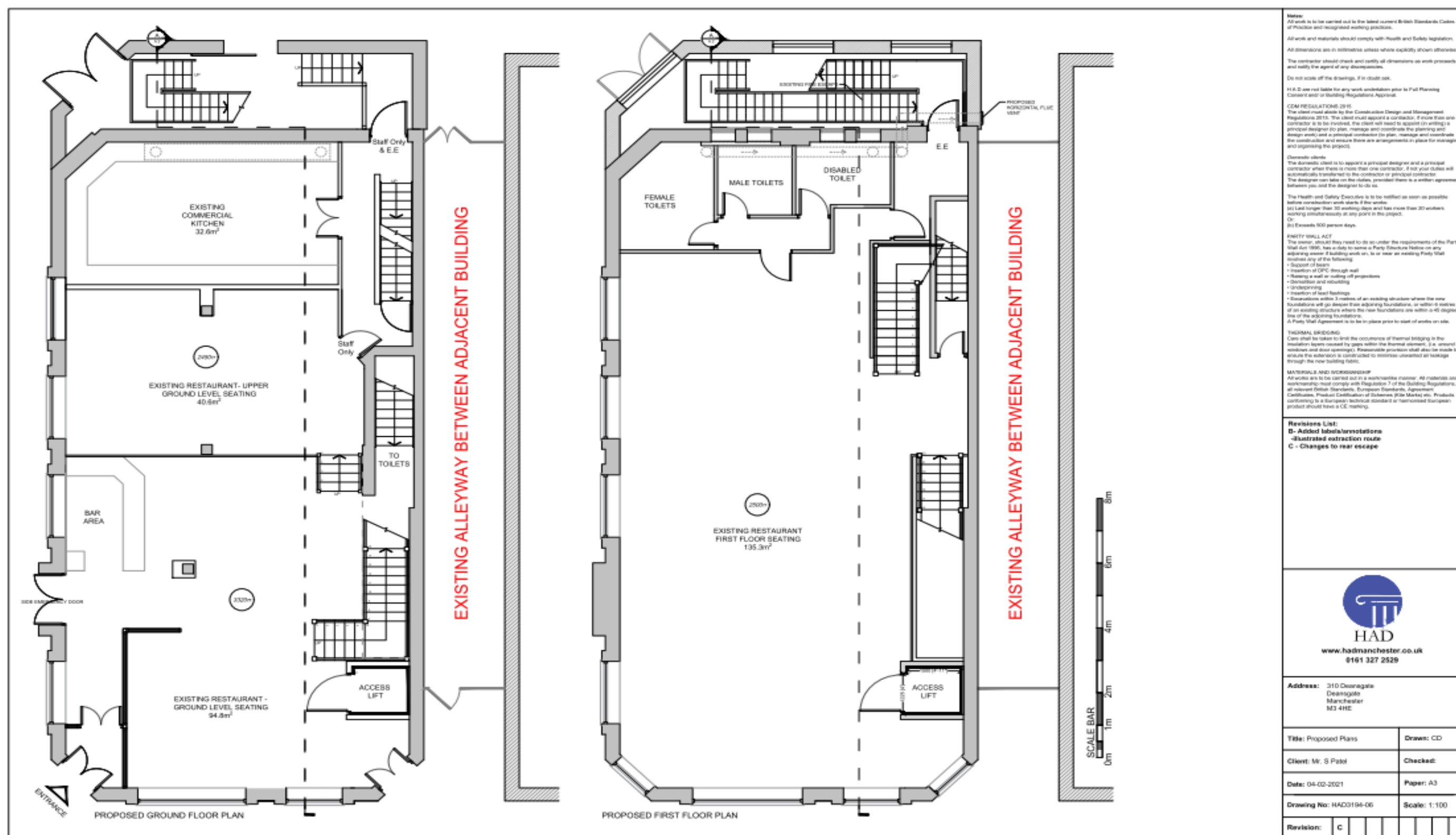
Rel - A.1	
Client: Mr. S. Patel	Checked:

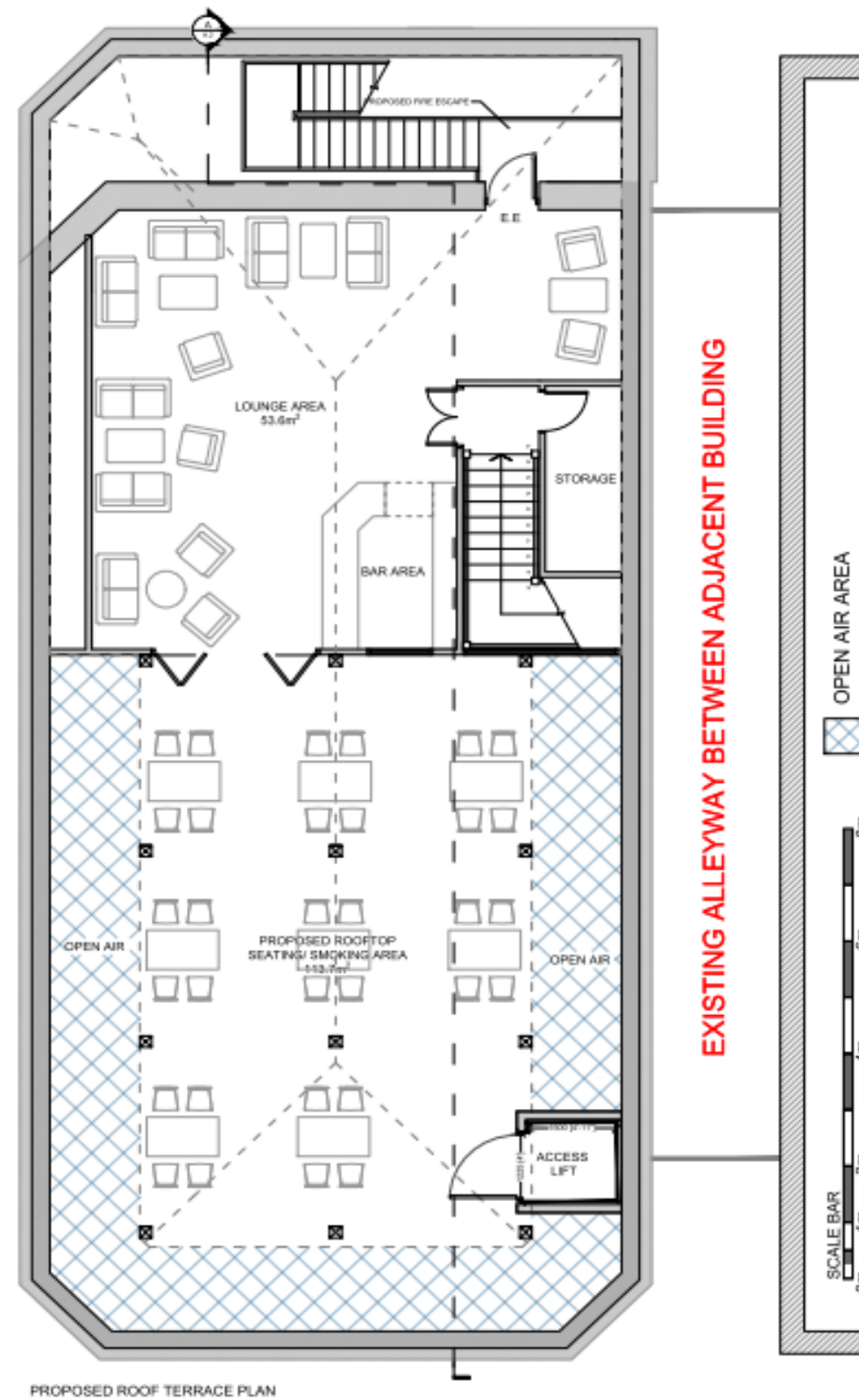
Notes: 12.00.0000 Pages: 43	Notes: 12.00.0000 Pages: 43
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Drawing No: HAD0196-05	Scale: 1:100
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Revision:	0						
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[illegible]





Wall Area Calculation				
Wall Name	Wall Width [m]	Wall Height [m]	Wall Area [m²]	Percent
A	2.48	2.51	6.23	
B	8.177	2.465	20.16	
C	1.75	2.465	4.31	
D	1.8	2.465	4.44	
E	1.75	2.465	4.31	
F	1.07	2.465	2.64	
G	1.468	2.465	3.62	
H	7.468	2.465	18.42	
I	1.468	2.465	3.62	
J	10.989	2.465	27.09	
Total Wall Area			94.82	[100%]
Overall Open Air Required			48.36	[51%]

Open Air Area Calculation				
Wall Name	Wall Width [m]	Wall Height [m]	Wall Area [m²]	Percent
A	6.545	2.51	16.43	
C	0.25	2.465	0.62	
D	1.8	2.465	4.44	
E	0.25	2.465	0.62	
Total Wall Excluding Open Air			22.10	[23.9%]
Total Open Air			72.72	[76.1%]

Notes:
All work is to be carried out to the latest current British Standards Codes of Practice and recognised working practices.
All work and materials should comply with Health and Safety legislation.
All dimensions are in millimetres unless where explicitly shown otherwise.
The contractor should check and verify all dimensions as work proceeds and notify the agent of any discrepancies.
Do not scale off the drawings, if in doubt ask.
H.A.D. are not liable for any work undertaken prior to Full Planning Consent and/or Building Regulations Approval.
CDM REGULATIONS 2015:
The client must appoint a Construction Design and Management (CDM) 2015. The client must appoint a contractor, if more than one contractor is to be involved, the client will need to appoint (in writing) a principal designer to plan, manage and coordinate the planning and design work and a principal contractor (in plan, manage and coordinate the construction and ensure there are arrangements in place for managing and organising the project).
Domestic clients:
The domestic client is to appoint a principal designer and a principal contractor when there is more than one contractor, if not your duties will automatically transferred to the contractor or principal contractor. The designer can take on the duties, provided there is a written agreement between you and the designer to do so.
The Health and Safety Executive is to be notified as soon as possible before construction work starts if the works:
(a) Last longer than 30 working days and has more than 30 workers working simultaneously at any point in the project.
Or:
(b) Exceeds 500 person days.
PARTY WALL ACT
The owner, should they need to do so under the requirements of the Party Wall Act 1996, has a duty to serve a Party Structure Notice on any adjoining owner if building work on, or near an existing Party Wall involves any of the following:
• Support of beams
• Insertion of DPC through wall
• Raising a wall or cutting off projections
• Demolition and rebuilding
• Underpinning
• Insertion of lead flashings
• Excavations within 3 metres of an existing structure where the new foundations will go deeper than adjoining foundations, or within 6 metres of an existing structure where the new foundations are within a 45 degree line of the adjoining foundations.
A Party Wall Agreement is to be in place prior to start of works on site.
THERMAL BRIDGING
Care shall be taken to limit the occurrence of thermal bridging in the insulation layers created by gaps within the thermal element, i.e. around windows and door openings. Reasonable provision shall also be made to ensure the extension is constructed to minimise unwanted air leakage through the new building fabric.
MATERIALS AND WORKMANSHIP
All work is to be carried out in a workmanlike manner. All materials and workmanship must comply with Regulation 7 of the Building Regulations, all relevant British Standards, European Standards, Agreements, Certificates, Product Certification of Suppliers (CE Marking) etc. Products conforming to a European technical standard or harmonised European product should have a CE marking.

Revisions List:
B - Added labels/notations
- Illustrated extraction route
C - Changes to rear escape



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Address: 310 Deansgate
Deansgate
Manchester
M3 4HE

Title: Proposed Plans	Drawn: CD
Client: Mr. S Patel	Checked:
Date: 04-02-2021	Paper: A3
Drawing No: HAC0194-06	Scale: 1:100
Revision:	C



Proposed Front Elevation
Deansgate



Proposed Rear Elevation
Longworth Street

Notes:
All work is to be carried out to the latest current British Standards Codes of Practice and recognised working practices.
All work and materials should comply with Health and Safety legislation.
All dimensions are in millimetres unless otherwise stated.
The contractor should check and verify all dimensions as work proceeds and notify the agent of any discrepancies.
Do not scale off the drawings, if in doubt ask.
H & C are not liable for any work undertaken prior to Full Planning Consent and/or Building Regulations Approval.
CEM REGULATIONS 2015:
The client must abide by the Construction Design and Management Regulations 2015. The client must appoint a contractor, if more than one contractor is to be involved, the client will need to appoint an entry level principal designer to plan, manage and coordinate the planning and design and a principal contractor to plan, manage and coordinate the construction and ensure there are arrangements in place for managing and organising the project.
Domestic clients:
The domestic client is to appoint a principal designer and a principal contractor when there is more than one contractor. If not, your duties will automatically transfer to the contractor or principal contractor. The designer can take on the duties, provided there is a written agreement between you and the designer to do so.
The Health and Safety Executive is to be notified as soon as possible before construction work starts if the work:
(a) Lasts longer than 30 working days and has more than 30 workers working simultaneously at any point in the project.
Or
(b) Exceeds 500 person days.
PARTY WALL ACT
The owner should be aware that they need to do so under the requirements of the Party Wall Act 1996, has a duty to serve a Party Structure Notice on any adjoining owner if building work on, or near an existing Party Wall involves any of the following:
• Support of beams
• Insertion of DPC through wall
• Raising a wall or cutting off projections
• Demolition and rebuilding
• Underpinning
• Insertion of new footings
• Reservations within 3 metres of an existing structure where the new foundations will go deeper than adjoining foundations, or within 6 metres of an existing structure where the new foundations are within a 6 degree line of the adjoining foundations.
A Party Wall Agreement is to be in place prior to start of work on site.
THERMAL BRIDGING
Care shall be taken to limit the occurrence of thermal bridging in the insulation layers caused by gaps within the thermal element, (i.e. around windows and door openings). Reasonable provision shall also be made to ensure the extension is constructed to minimise unwanted air leakage through the new building fabric.
MATERIALS AND WORKMANSHIP
All work is to be carried out in a workmanlike manner. All materials and workmanship must comply with Regulation 7 of the Building Regulations, all relevant British Standards, European Standards, Agreement, Certificates, Product Certification of Suppliers (BBA Mark) etc. Products conforming to a European technical standard or harmonised European product should have a CE marking.

Revisions List:
B- Added labels/notations
C-Elevation and roof changes



Address: 310 Deansgate
Deansgate
Manchester
M3 4HE

Title: Proposed Elevations	Drawn: CD
Client: Mr. S Patel	Checked:
Date: 04-02-2021	Paper: A3
Drawing No: HADG194-06	Scale: 1:100
Revision:	
C	



Notes:
All work is to be carried out to the latest current British Standards Codes of Practice and recognised working practices.
All work and materials should comply with Health and Safety legislation.
All dimensions are in millimetres unless where explicitly stated otherwise.
The contractor should check and verify all dimensions on work presented and notify the agent of any discrepancies.
Do not scale off the drawings, if in doubt ask.
H.R.C are not liable for any work undertaken prior to Full Planning Consent and/or Building Regulations Approval.
CDM REGULATIONS 2015
The client must appoint a principal designer and a principal contractor. If more than one contractor is to be involved, the client will need to appoint (in writing) a principal designer to plan, manage and coordinate the planning and design work, and a principal contractor to plan, manage and coordinate the construction and ensure there are arrangements in place for managing and organising the project.
Domestic clients
The domestic client is to appoint a principal designer and a principal contractor when there is more than one contractor. If not your client will automatically transfer to the contractor or principal contractor. The designer can take on the duties, provided there is a written agreement between you and the designer to do so.
The Health and Safety Executive is to be notified as soon as possible before construction work starts if the work:
(a) Lasts longer than 30 working days and has more than 20 workers working simultaneously at any point in the project.
Or
(b) Exceeds 500 person days.
PARTY WALL ACT
The owner, should they need to do so under the requirements of the Party Wall Act 1996, has a duty to serve a Party Notice on any adjoining owner if building work on, is or near an existing Party Wall includes any of the following:
• Excavation of land
• Insertion of a wall or raising of projections
• Demolition and rebuilding
• Driveway
• Insertion of new openings
• Excavations within 3 metres of an existing structure where the new foundations will go deeper than the existing foundations, or within 6 metres of an existing structure where the new foundations are within a 45 degree line of the adjoining foundations.
A Party Wall Agreement is to be in place prior to start of work on site.
THERMAL BRIDGING
Care shall be taken to limit the occurrence of thermal bridging in the insulation layers created by open wall or thermal elements, i.e. around windows and door openings. Reasonable provision shall also be made to ensure the structure is constructed to minimise unwanted air leakage through the new building fabric.
MATERIALS AND WORKMANSHIP
All work is to be carried out in a workmanlike manner. All materials and workmanship must comply with Regulation 7 of the Building Regulations, all relevant British Standards, European Standards, Agreements, Certificates, Product Certification of Suppliers (PCE) and, Products conforming to a European technical standard or harmonised European product should have a CE marking.

Revisions List:
B - Added labels/notations
C - Elevation and roof changes



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www.hadmanchester.co.uk
0161 327 2529

Address: 210 Deansgate
Deansgate
Manchester
M3 4HE

Title: Proposed Elevations		Drawn: CD	
Client: Mr. S Patel		Checked:	
Date: 04-02-2021		Paper: A3	
Drawing No: HAD0196-09		Scale: 1:100	
Revision:	C		

