

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

BURO HAPPOLD



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Manchester Life, Poland Street zone Jersey Wharf

Acoustic planning report

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A	12 Nov 21		Christian Clark	James Atha
B	7 Jan 22	Inclusion of TM 59 assessment	Christian Clark	James Atha
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D	4 May 22	Updates following comments from Deloitte	James Atha	Mark Howarth

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Summary

Sandy Brown has been commissioned by Manchester Life Development Company 3 Limited to provide acoustic advice in relation to the proposed development, Manchester Life, Poland Street zone, Jersey Wharf at Jersey Street, Ancoats, Manchester.

An environmental noise survey has been carried out to determine the existing sound levels in the area. These are used to set appropriate plant noise limits in line with the requirements of Manchester City Council.

Noise surveys have been carried out at two positions at the site between 3 September and 7 September 2021 (facing Jersey Street), and between 25 February 2021 and 8 March 2021 (facing the canal side). To the north of the site (Jersey Street), the representative background sound level measured during the survey were $L_{A90,15min}$ 42 dB during the daytime and $L_{A90,15min}$ 36 dB at night. To the south of the site (canal side), the representative background sound level measured during the survey were $L_{A90,15min}$ 36 dB during the daytime and $L_{A90,15min}$ 32 dB at night.

Based on the requirements of Manchester City Council, plant limits have been set such that the cumulative noise levels at 1 m from the worst affected window of the nearby noise sensitive premises is to be at least 5 dB below the typical background noise levels measured, when taking into account facade effects. These limits are cumulative and apply with all plant operation under normal conditions. If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied, and the limits will be more stringent than those set.

A noise ingress assessment has been carried out for the apartments based on the survey results and 3D acoustic modelling. Minimum recommended facade sound insulation requirements have been set based on controlling noise ingress to meet with the requirements of Manchester City Council. This assessment indicates that standard thermal double glazing e.g. (6/16/6) providing a performance of $R_w + C_{tr}$ 28 dB is expected to be sufficient for all apartments within the scheme.

An assessment against the Acoustics, Ventilation and Overheating Guidance (AVO) has been carried out for the apartments which indicates that partially opening windows will be feasible to control overheating without resulting in significant adverse effects.

An assessment of noise ingress to bedrooms during the night in line with Approved Document O has also been undertaken. The assessment indicates that compliance is expected.

The survey results have been used to set amplified sound breakout limits for the commercial units proposed, outside the nearby noise sensitive receptors, in line with the typical requirements of Manchester City Council. Guidance on internal limits is provided which will be subject to further design development and the final constructions/arrangements installed.

Noise transfer limits from commercial units to apartments within the development have also been set in line with criteria from Manchester City Council.

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1 Introduction

Sandy Brown has been commissioned by Manchester Life Development Company 3 Limited to provide acoustic advice in relation to the proposed development, Manchester Life, Poland Street zone, Jersey Wharf.

As part of this, an environmental noise survey has been carried out, the purpose of which is to establish the existing sound levels on and around the site. The results of the survey have been used to set appropriate limits for noise egress in line with the requirements of Manchester City Council.

The results of the survey have also been used to inform then design of the development with respect to environmental noise ingress through the building envelope, plant noise egress, and operational noise egress, in line with the requirements of Manchester City Council.

This report presents the survey method, results of the environmental noise survey, and determines appropriate noise egress limits at the nearest noise sensitive premises. Guidance on amplified noise breakout, facade sound insulation, an AVO assessment and assessment against Approved Document O are also provided.

2 Site description

2.1 Description of the development

The proposed development comprises of 190 residential units with five commercial units, staff facilities, cycle stores, plant rooms, a loading bay, disabled parking and refuse at ground floor.

The key noise sources within the scheme can be broadly divided into two categories:

- Building services plant
- Internal activity in commercial units including the loading bays.

The potential impact of these sources has been assessed and mitigation measures have been proposed to minimise impact on existing noise sensitive premises around the development.

2.2 The site and its surroundings

The site location in relation to its surroundings is outlined in yellow in Figure 1.

The site is bounded by Jersey Street to the north, Rochdale Canal to the south and Flint Glass Wharf (a residential building) to the west, and grassland to the east.

There is proposed residential development (Eliza Yard) on the corner of Jersey Street and Poland Street which is opposite the site.



Figure 1 Aerial view of site (courtesy of Google Earth Pro)

2.3 Adjacent premises

The site is located within a mixed residential, commercial and industrial area. A summary of the nearby premises are set out below in reference to Figure 1.

1. Residential premises on Jersey St, Rodney St and Mozart Close (highlighted in yellow)
2. Residential premises at Flint Glass Wharf (highlighted in light blue)
3. Residential premises at Canal Point, Navigation Street, Burgess House, Avro House, 3 New Union St (highlighted in blue)
4. Proposed residential accommodation on Eliza Yard (highlighted in red)
5. Trading estate at City Court (highlighted in orange)
6. Flint Glass Works, 62-64 Jersey St understood to be office space (highlighted in green)
7. Commercial area including site offices and depot (highlighted in pink)

Warehouse spaces are located on George Leigh St and Naval St (highlighted in purple).

3 Assessment criteria

3.1 NPPF and NPSE

The National Planning Policy Framework, July 2021 (NPPF) sets out the UK government's planning policies for England. It supersedes previous guidance notes such as PPG24. No

specific noise criteria are set out in the NPPF, or in the Noise Policy Statement for England (NPSE) to which it refers.

The NPPF states:

‘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:

- *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.*
- *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason.’*

and

‘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.’

The NPSE states that its aims are as follows:

‘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.’*

As such, neither document sets out specific acoustic criteria for new residential developments, but they require consideration of the effect of existing noise on the new development and the effect of noise from the development on the surroundings.

3.2 Noise egress

3.2.1 Standard guidance

BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound* (BS 4142) provides a method for assessing noise from items such as building services plant

against the existing background sound levels at the nearest noise sensitive premises.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

3.2.2 Local Authority criteria

Manchester City Council (MCC) provides guidance in relation to plant noise emissions in *Planning and Noise Technical Guidance* document dated December 2015. It states the following in relation to plant noise egress:

'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.'

3.3 Noise ingress

3.3.1 Manchester City Council Guidance and BS8233

Guidance on acceptable internal noise levels in residential dwellings is given in Manchester City Council's Planning and Noise Technical Guidance. This also references BS 8233:2014 *Sound insulation and noise reduction for buildings*.

Manchester City Council's guidance includes 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}
- Gardens and terraces (daytime) 55 dB L_{Aeq} .

These internal levels are based on BS8233 criteria which uses annual average data. It is normal to exclude occasional events, such as fireworks night or New Year's Eve.

Where development is considered necessary or desirable, the internal target levels may be relaxed by up to 5 dB and reasonable internal conditions still achieved.

For external amenity areas, such as gardens and patios, BS8233 states:

'it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$ with an upper guideline value of 55 dB $L_{Aeq,T}$ which would be acceptable in noisier environments. However, it is also recognized that these guideline values are not achievable in all circumstances where development might be desirable. In higher noise areas, such as

city centres or urban areas adjoining the strategic transport network, a compromise between elevated noise levels and other factors, such as the convenience of living in these locations or making efficient use of land resources to ensure development needs can be met, might be warranted. In such a situation, development should be designed to achieve the lowest practicable levels in these external amenity spaces, but should not be prohibited.'

3.3.2 Amplified sound breakout criteria

Manchester City Council require amplified sound egress to be 10 dB below the typical background noise level in octave bands outside the nearby noise sensitive premises.

3.3.3 Acoustics, Ventilations and Overheating Guide (AVO)

Guidance on external noise levels from transport noise sources and the assessment of risk in an overheating condition is given in the Association of Noise Consultants *Acoustics Ventilation and Overheating, Residential Design Guide* (AVOG). The guidance internal noise levels during the overheating condition from AVOG are reproduced for reference in Table 1.

As illustrated in Figure 2, the potential for adverse risk increases with the duration of exposure to noise, ie, a shorter exposure will result in a lower risk of adverse outcomes. L_{AFmax} 65 dB is known to correspond to remembered awakenings and so represents significant sleep disturbance.

Table 1 Guidance for assessment of noise from transport sources relating to overheating condition

Risk description	Internal noise level		
	Daytime (07:00-23:00)	Night (23:00-07:00)	
Standard design condition	$L_{Aeq} \leq 35$ dB	$L_{Aeq} \leq 30$ dB	L_{AFmax} 45 dB not normally exceeded
Typically accepted exceedance	$L_{Aeq} > 35$ dB and $L_{Aeq} \leq 40$ dB	$L_{Aeq} > 30$ dB and $L_{Aeq} \leq 35$ dB	-
Risk dependent on duration	$L_{Aeq} > 40$ dB and $L_{Aeq} \leq 50$ dB	$L_{Aeq} > 35$ dB and $L_{Aeq} \leq 42$ dB	-
Upper limit	$L_{Aeq} > 50$ dB	$L_{Aeq} > 42$ dB	L_{AFmax} 65 dB not exceeded

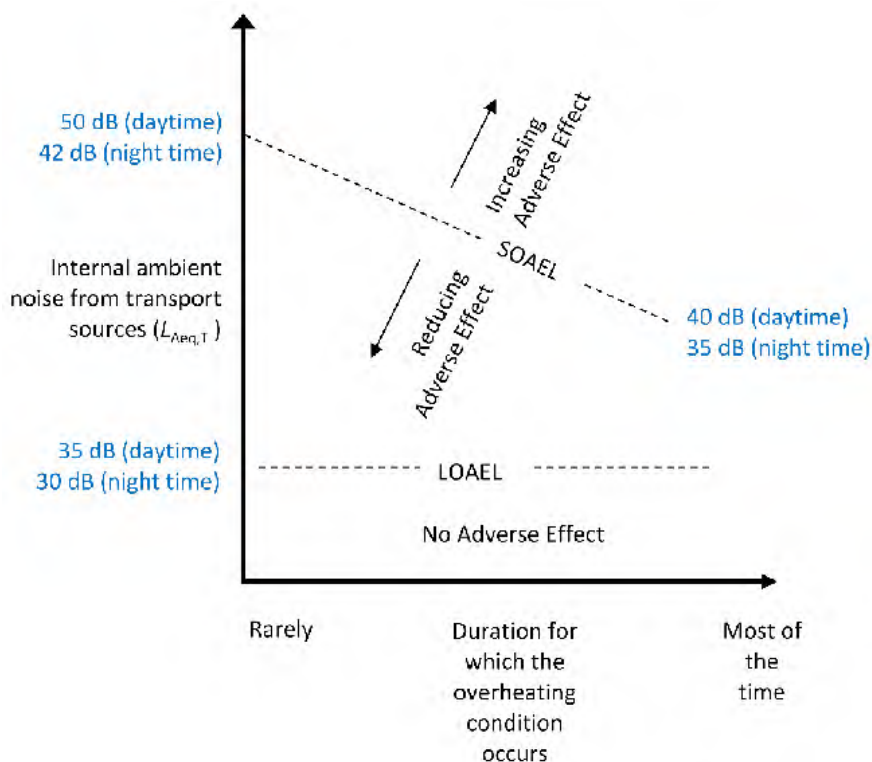


Figure 2 Internal ambient noise levels and increasing adverse effects for an overheating condition

3.3.4 Approved Document O

Approved Document O 2021 Edition (to the Building Regulations 2010) states the following in relation to noise ingress during overheating periods:

'In locations where external noise may be an issue (for example, where the local planning authority considered external noise to be an issue at the planning stage), the overheating mitigation strategy should take account of the likelihood that windows will be closed during sleeping hours (23:00-07:00 hours).

Windows are likely to be closed during sleeping hours if noise within bedrooms exceeds the following limits.

- a. $L_{Aeq,T}$ 40 dB average over 8 hours (between 23:00-07:00)
- b. L_{AFmax} 55 dB more than 10 times a night (between 23:00-07:00).'

The above applies to residential dwellings, institutional residential accommodation, and other types of residential accommodation, such as student accommodation.

ADO2021 takes effect on 15 June 2022 for use in England. It does not apply to work subject to a building notice, full plans application or initial notice submitted before that date, provided the work for each building is started before 15 June 2023.

4 Noise survey method

The survey included both unattended and attended noise measurements.

4.1 Unattended measurements

The unattended measurement locations are indicated in Figure 1.

At position A, facing Jersey Street, unattended measurements were carried out by Daniel Shaw between 3 September and 7 September 2021.

At position B, facing the canal, the unattended measurements were taken over 15 minute periods between 13:45 on 5 March 2021 and 10:15 on 8 March 2021. The equipment was installed and collected by José M. González.

At position A the microphone was mounted on a tripod approximately 1.2 m above the ground level and at least 3 m from any other reflective surface. At position B the microphone was mounted 1 m from the facade out of a first-floor window. Measurements were carried out in 15 minute periods. Photographs of the locations are provided below.

Details of the equipment used and the noise indices measured are provided in Appendix A.



Figure 3 Photograph of measurement positions A (left) and B (right)

4.2 Weather conditions

Weather conditions during the survey are described in Appendix A.

5 Noise survey results

5.1 Attended measurements

Attended synchronised daytime sample measurements were performed by José M. González at 3 locations around the site. These are indicated in Figure 1 as positions 1 to 3. The measurements were carried out on 5 March 2021, over 5 minute periods.

At each position the microphone was mounted on a tripod approximately 1.2 m above the ground level. For position 1, the microphone was located approximately 1 m from a reflective surface. For positions 2 and 3, the microphone was located at least 5 m from a reflective surface. Details of the equipment used and the noise indices measured are provided in Appendix A.

Dominant noise sources occurring during the measurements were noted.

5.2 Observations

At position A, the dominant noise sources observed at the site during the survey consisted of road traffic on Jersey Street. At position B, noise sources observed at the site during the survey consisted of occasional distant road traffic and distant construction activities.

Less significant noise sources included distant construction site, pedestrians passing by talking and wildlife.

5.3 Unattended measurement results (position A)

Graphs showing the results of the unattended measurements are provided in Appendix B.

Day and night-time ambient noise levels measured during the unattended survey are presented in Table 2.

Table 2 Ambient noise levels measured during the unattended survey at position A

Date	Daytime (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Friday 3 September 2021	-	45
Saturday 4 September 2021	52	45
Sunday 5 September 2021	50	47
Monday 6 September 2021	54	45
Average	53	46

In line with BS 4142: 2014, for the purpose of analysis and establishing representative background sound levels, daytime and night-time typical levels have been quantified using statistical analysis from the continuous logging measurements.

Daytime and night-time statistical analysis of representative values for the site are given in the graphs below.

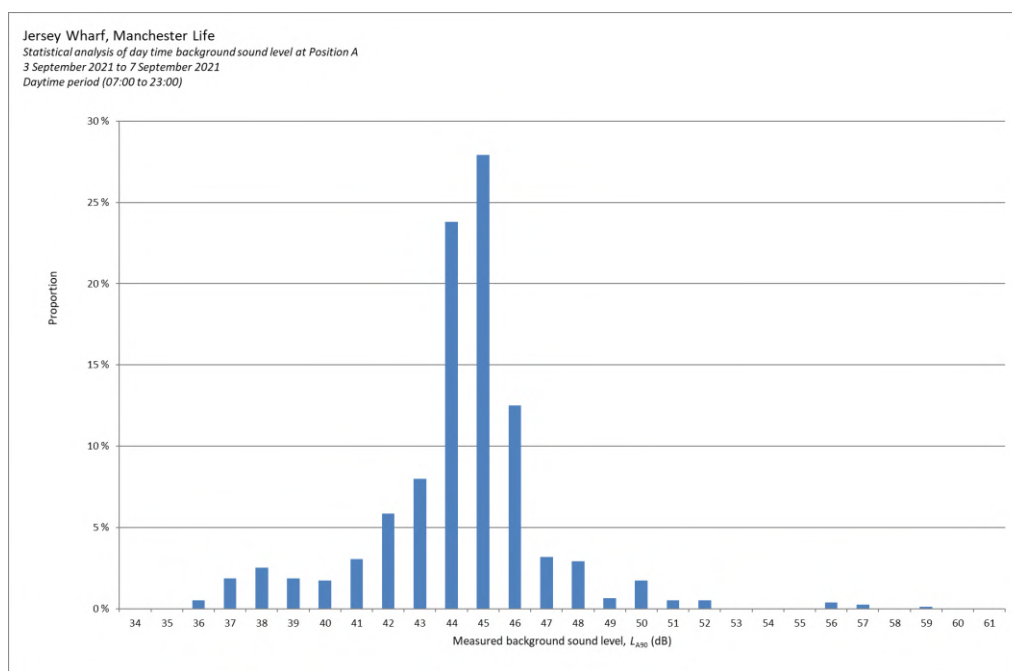


Figure 4 Histogram of daytime background noise levels measured at position A in the free field

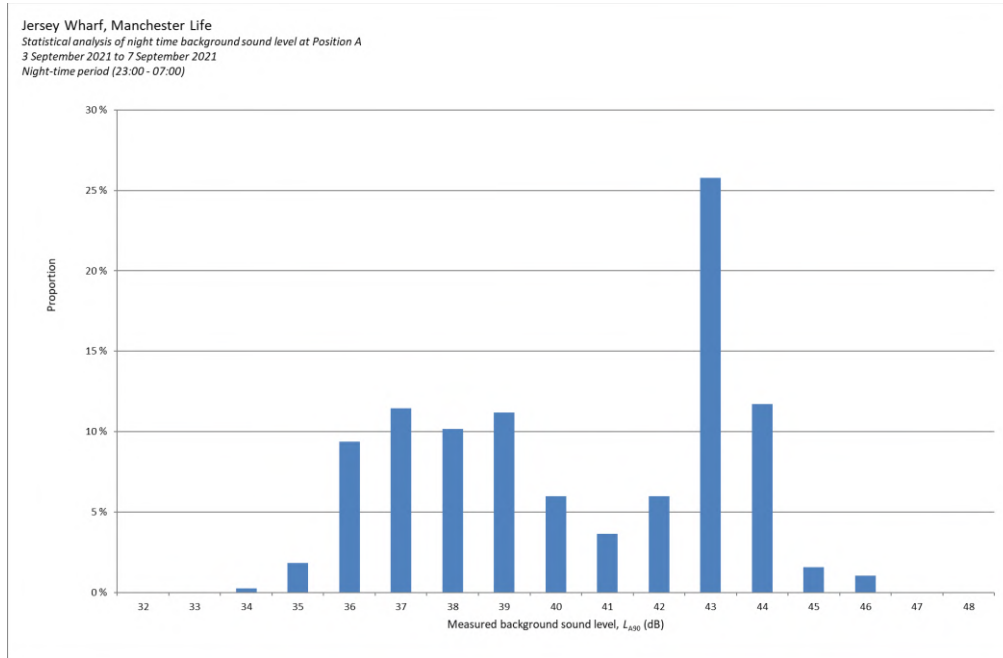


Figure 5 Histogram of night-time background noise levels measured at position A in the free field

Based on the above levels, the representative background noise levels measured during the survey are:

- L_{A90} 42 dB daytime (L_{A90} 45 dB equivalent facade level)
- L_{A90} 36 dB night-time (L_{A90} 39 dB equivalent facade level).

5.4 Unattended measurement results (position B)

A graph showing the results of the unattended measurements is provided in Appendix B.

Day and night-time ambient noise levels measured during the unattended survey are presented in Table 3.

Table 3 Ambient noise levels measured during the unattended survey

Date	Daytime (07:00 – 23:00) $L_{Aeq,16h}$ (dB)	Night (23:00 – 07:00) $L_{Aeq,8h}$ (dB)
Friday 5 March 2021	44 ^[1]	44
Saturday 6 March 2021	45	49
Sunday 7 March 2021	52	42
Monday 8 March 2021	54 ^[1]	-
Average	49	45

^[1] Measurement not made over full period due to monitoring start and end time (the measurement on Thursday 5 March 2021 was over 9 hours, and on Monday 8 March 2021 over 3.15 hours); not included in the average.

In line with BS 4142: 2014, for the purpose of analysis and establishing representative background sound levels, daytime and night-time typical levels have been quantified using statistical analysis from the continuous logging measurements.

Daytime and night-time statistical analysis of representative values for the site are given in Figure 6 and Figure 7.

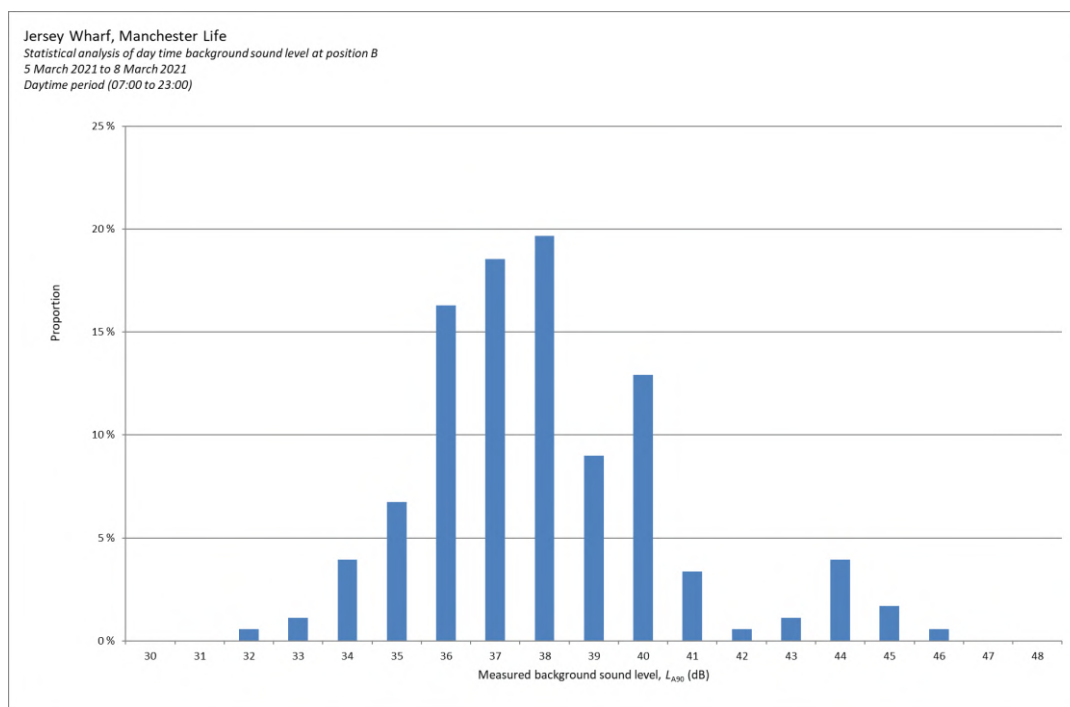


Figure 6 Statistical analysis of daytime background sound level (position B)

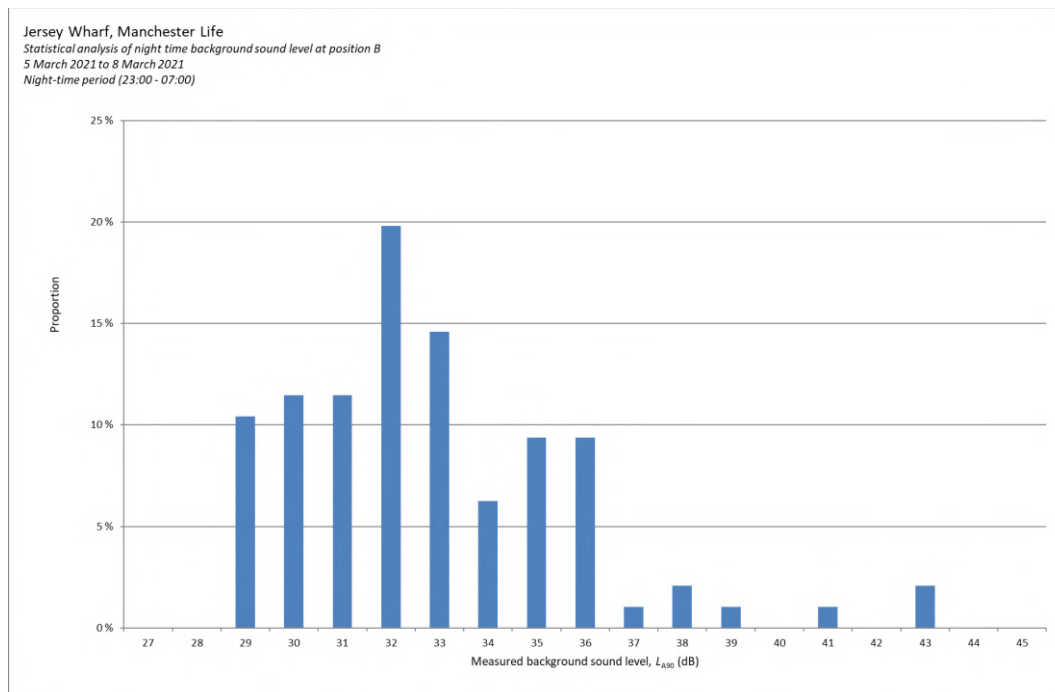


Figure 7 Statistical analysis of night-time background sound level (position B)

From this analysis, the representative background sound levels measured during the survey were:

- $L_{A90,15min}$ 36 dB during the daytime (L_{A90} 39 dB equivalent facade level)
- $L_{A90,15min}$ 32 dB at night. (L_{A90} 35 dB equivalent facade level)

5.5 Attended measurement results

Noise levels and key sources recorded during the attended measurements are summarised in Table 4.

Table 4 Noise levels and key noise sources from attended measurements

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
A	10:35	49	63	44	Road traffic on Jersey Street, pedestrians passing by talking, distant construction site activities (Fulmer Dr)
	10:40	50	69	45	
	10:45	58	77	46	
	10:50	53	72	45	

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
	10:55	52	70	45	
	11:00	52	67	45	
	11:05	50	64	46	
	11:10	53	71	45	
	11:15	51	67	46	
	11:20	54	70	47	
	11:25	53	65	46	
	11:30	52	66	45	
	11:35	54	77	46	
	11:40	50	67	45	
	11:45	52	66	46	
	11:50	54	65	46	
	11:55	55	71	46	
	12:00	62	83	46	
	12:05	51	67	45	
	12:10	54	70	44	Road traffic on Jersey Street, pedestrians passing by talking, distant construction site activities (Fulmer Dr)
	12:15	48	65	44	
	12:20	53	71	44	
	12:25	52	62	46	
	12:30	54	68	45	
	12:35	50	66	45	
	12:40	53	68	46	
1	10:35	52	79	41	Road traffic on Jersey Street, pedestrian talking, seagulls, maximum levels due to parking metal door closing
	10:40	51	73	42	

Position	Start time	Sound pressure levels (dB)			Noise sources
		$L_{Aeq,5min}$	$L_{AFmax,5min}$	$L_{A90,5min}$	
	10:45	59	76	44	As above, car pass by
	11:35	53	76	42	Distant road traffic on Jersey Street, pedestrians talking,
	11:40	54	79	41	As above, maximum levels due to parking metal door closing
	11:45	54	71	42	Distant road traffic on Jersey Street, distant reverse beeping
	10:55	46	68	43	Distant road traffic, distant reverse beeping, Bird song, distant construction site activities, distant siren
	11:00	46	58	43	As above
	11:05	48	65	45	As above
	11:55	49	65	43	As above
2	12:05	46	57	42	As above, aircraft overhead
3	12:10	45	58	42	As above, bird song
	11:15	49	57	47	Distant construction site activities, aircraft overhead
	11:20	51	65	47	Distant construction site activities
	11:25	48	59	46	As above
	12:25	50	65	45	
	12:30	48	64	44	
	12:35	46	61	44	

6 Building services noise egress

6.1 Standard guidance

Guidance for noise emission from proposed new items of building services plant is given in BS 4142: 2014 '*Methods for rating and assessing industrial and commercial sound*'.

BS 4142 provides a method for assessing noise from items such as building services plant against the existing background sound levels at the nearest noise sensitive.

BS 4142 suggests that if the noise level is 10 dB or more higher than the existing background sound level, it is likely to be an indication of a significant adverse impact. If the level is 5 dB above the existing background sound level, it is likely to be an indication of an adverse impact. If the level does not exceed the background level, it is an indication of having a low impact.

If the noise contains 'attention catching features' such as tones, bangs etc, a penalty, based on the type and impact of those features, is applied.

6.2 Local Authority criteria

Manchester City Council (MCC) provides guidance in relation to plant noise emissions in *Planning and Noise Technical Guidance* document dated December 2015 states the following in relation to plant noise egress:

'The development should be 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.'

Corrections for tonal or attention catching characteristics would need to be applied to the rating level in accordance with BS4142: 2014.

6.3 Limits

6.3.1 Normally operating plant

Based on the above criteria and the measurement results, the cumulative noise level from the operation of all new plant should not exceed the limits set out in Table 5.

The limits apply at 1 m from the worst affected windows of the nearest noise sensitive premises and are presented as facade levels (a 3 dB facade correction have been applied to the free-field measurement results).

Table 5 Plant noise limits at 1 m from the nearest noise sensitive premises

Location	Maximum sound pressure level at 1 m from noise sensitive premises, $L_{Aeq,15min}$ (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Eliza Yard, Flint Glass Wharf,	40	34
Residential premises at Canal Point, Navigation Street, Burgess House, Avro House, 3 New Union St	34	30
Flint Glass Works, 62-64 Jersey St	40	-

[2] The limits set out in Table 5 do not include any attention catching features. Penalty corrections for attention catching features may be significant and will need to be considered as the building services design progresses. This is discussed in Appendix C.

6.3.2 Emergency plant

MCC typically stipulate that noise egress associated with emergency/life-safety plant should not exceed a level 10 dB above the typical background noise level at the nearest noise sensitive receptors.

This is on the basis that it would normally be routinely tested during the daytime for brief periods, and that it would only ever run at night during an actual emergency.

The limits for emergency plant (which apply outside the nearby receptors) are provided below based on the survey results.

Table 6 Emergency plant noise limits at 1 m from the nearest noise sensitive premises

Location	Maximum sound pressure level from emergency plant at 1 m from noise sensitive premises, L_{Aeq} (dB)	
	Daytime (07:00-23:00)	Night-time (23:00-07:00)
Eliza Yard, Flint Glass Wharf	55	49
Canal Point, Navigation Street, Burgess House, Avro House, 3 New Union St	49	45
Flint Glass Works, 62-64 Jersey St	55	-

6.4 Assessment

All building services plant will need to be carefully selected to achieve the noise limits set out above, including any corrections for attention catching features.

An assessment will need to be carried out once equipment selections become available to demonstrate compliant with the above limits.

7 Facade sound insulation – noise ingress

This section describes an assessment of facade sound insulation to control noise ingress to the apartments. The required facade specification largely depends on the external noise levels and the internal noise criteria.

The following assessment is based on achieving the internal noise criteria from Manchester City Council, which are set out in Section 3.3.

7.1 3D noise modelling

A computer model of the site and its surrounding has been built using CadnaA software by Datakustik, with the purposes of calculating the external noise levels at the different facades of the proposed development based on the results of the environmental noise surveys.

The software carries out calculation using a ray tracing technique. This takes into account the effects to topography, reflections, screening and distance attenuation for noise sources to predicts noise levels in three dimensions. Calculations are carried out in accordance with ISO 9613 *Attenuation of sound during propagation outdoors*.

Eliza Yard is a proposed new development across the road on Jersey street which has recently obtained planning permission. It is therefore included in the model. An image of the computer model is provided in Figure 8 and Figure 9.

The 3D model has been calibrated based on the noise levels measured during the environmental noise surveys.

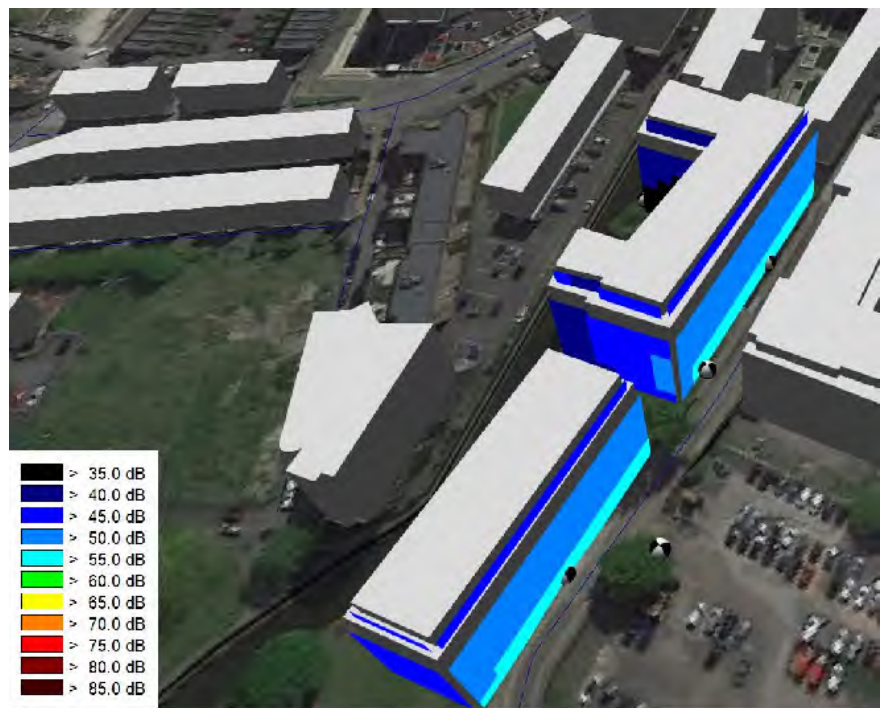


Figure 8 Screenshot of 3D environmental noise model – Predicted facade noise levels, daytime, L_{Aeq} (dB)

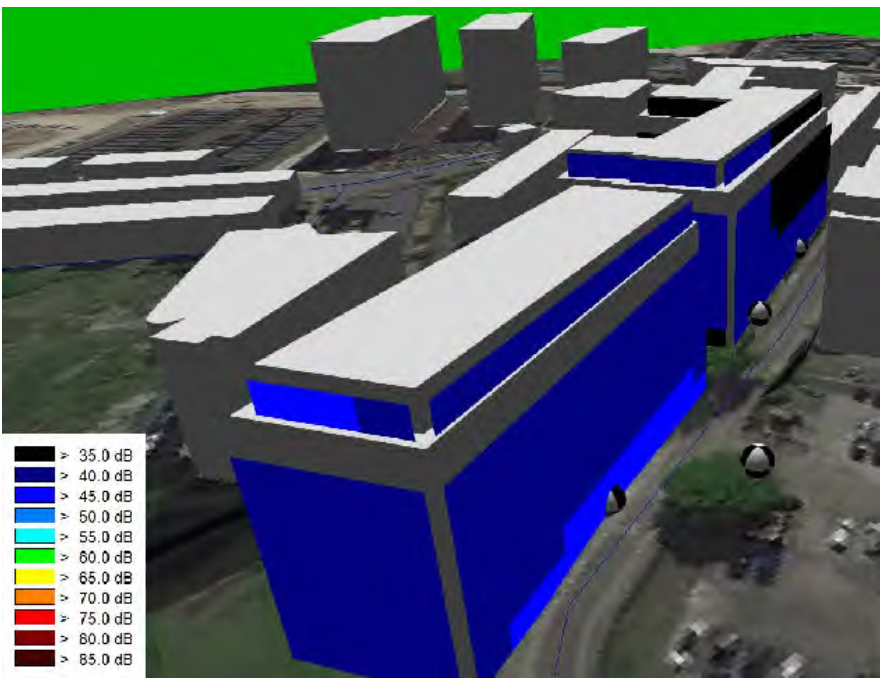


Figure 9 Screenshot of 3D environmental noise model – Predicted facade noise levels, night-time, L_{Aeq} (dB)

Predicted external ambient noise levels at the apartments vary from L_{Aeq} 47 to 62 dB during the day and L_{Aeq} 40 to 62 dB during the night.

7.2 External noise levels outside facades

The predicted external noise levels at each facade of the proposed development have been rationalised and presented as facade zones.

The locations of each facade zone and external noise levels are provided as mark-ups in Appendix D.

Maximum levels from car pass-bys along Jersey Street were measured in the range of L_{Amax} 74 to 80 dB during the night-time, with the typical maximum not normally exceeded being L_{Amax} 67 dB.

The environmental noise model does not currently include noise from plant associated with the development, though this would be designed such that the noise levels are not significantly increased. Nor does it include any increased likelihood of additional single events such as late-night taxis or traffic associated with the development of the area.

7.3 Facade sound insulation

The predicted noise levels have been grouped into zones. The predicted external noise levels at the facades of the proposed development for daytime and night-time are marked-up in Appendix D.

7.3.1 Minimum overall sound insulation

Minimum overall facade sound insulation requirements for the facades, under the background ventilation condition are given in Table 7. These have been determined to achieve the internal noise criteria for bedrooms and living areas using the predicted external noise levels at the facades.

The facade specification has been determined to ensure that $L_{AFmax\ 15\ min}$ criteria is exceeded on no more than 15 occasions based on the worst affected night during the survey.

At this site, the facade performance requirements are driven by the daytime ambient noise levels for living rooms, and night-time ambient noise levels for bedrooms. For bedrooms overlooking Jersey Street, maximum noise level drives the facade performance requirements.

Table 7 Facade sound insulation performance requirements

Facade zone	Predicted noise level		Overall sound insulation performance $R'_w + C_{tr}$ (dB)	
	L_{Aeq} (dB)	$L_{AFmax,5min}$ (dB) not normally exceeded at night-time	Living room	Bedroom
A 	54-56	-	21	21
B 	51-53	-	18	23
C 	47-49	-	14	19
AA 	-	68-71 ^[1]	-	27
BB 	-	57-67 ^[1]	-	22

^[1] 3 dB correction included to account for free-field measurement conditions

7.3.2 Guidance on facade construction, glazing and ventilation strategy

Background ventilation to bedrooms and living areas will be provided by mechanical ventilation heat recovery units (MVHR) for all apartments.

The assessment indicates that a maximum overall sound insulation performance of $R'_w + C_{tr}$ 27 dB is required for bedrooms in facade zone B. As a guide, standard thermal double glazing e.g. 6/16/6 is typically capable of providing a sound insulation performance of $R'_w + C_{tr}$ 28 dB and is therefore expected to be suitable throughout.

7.4 AVO Assessment

General ventilation is proposed to be provided by MVHR units to each apartment. When required, it is proposed that overheating be alleviated by use of opening tilted windows to provide additional ventilation. The windows can be adjusted so that they are slightly open to provide trickle ventilation or fully open to provide maximum ventilation.

The noise attenuation provided will depend on the degree of opening. Appendix C of the AVO guide provides the following information based on a field study in Switzerland:

They measured (free-field) outside-to-inside level differences of 10.0 ± 2.9 dB for open windows and $15.8 \text{ Open} \pm 2.7$ dB for tilted windows. A value of 13 dB is consistent with a situation between 'open' and 'tilted'.

Calculated internal noise levels shown in The predicted worst-case internal levels for the worst affected elevation of the proposed development (overlooking Jersey Street) are summarised below.

Table 9 which are based on a free-field outside to inside level difference insulation of 13 dB. A potential variation of ± 3 dB should be considered to allow for adjustment of window openings.

The overheating analysis was carried out by the building services engineer, Buro Happold, in accordance with CIBSE TM59:2017 *Design methodology for the assessment of overheating risk in homes* methodology, assessing two key criteria:

1. For living rooms, kitchens and bedrooms: the number of hours during which ΔT is greater than or equal to 1°C during the period May to September inclusive shall not be more than 3 per cent of occupied hours.
2. Predominantly naturally ventilated - for bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of annual hours (>32 hours per year).

or

Predominantly mechanically ventilated - for homes with restricted window openings, the CIBSE fixed temperature test must be followed, i.e. all occupied rooms should not exceed an operative temperature of 26°C for more than 3% of the annual occupied annual hours.

The results of the thermal analysis clearly demonstrated that with the open windows the overheating risk could be mitigated and compliance with both TM59 criteria could be achieved. The full assessment is provided in Appendix E.

The AVO guide provides a graphical format for assessing the significance of adverse effects, as shown in Figure 2. This plots the predicted internal ambient noise level during overheating conditions against the duration for which the overheating condition occurs.

Scaling of the x-axis is not specified in the AVO guide and is therefore open to interpretation. As overheating in England is largely an issue associated with summer months, the x-axis has been scaled based on the percentage time that windows would be opened to control internal temperatures over 22°C during the period between May and September. This period aligns with the period used for the thermal assessments in TM52:2013 *The Limits of Thermal Comfort: Avoiding overheating in European Buildings*.

There are 153 days from May to September. In line with the acoustic requirements, daytime is considered to be 16 hours from 07:00 to 23:00; night-time is 8 hours from 23:00 to 07:00. The daytime X-axis therefore extends to 100 % equalling a maximum of $153 \times 16\text{hrs} = 2448\text{ hrs}$. The night-time X-axis extends to 100% equalling a maximum of $153 \times 8\text{ hrs} = 1224\text{ hrs}$. The number of hours windows could be open to control overheating has been calculated from the thermal assessment by the building services consultant, Buro Happold. These have been plotted on the x-axis as a percentage of hours open. So, for example, a bedroom with a point at 45% equates to windows being open for a total of 551 hrs (45% of 1224 hrs) between May and September for control of overheating.

This approach has been discussed with one of the authors of the AVO Guide, Andrew Long, who has provided confirmation that this is a reasonable approach for this project. A note confirming this is provided in Appendix F.

Graphs based on the predicted internal noise levels are provided in Appendix G. Where two positions are plotted on one graph, each represents a single bedroom within a two-bedroom apartment. The graphs demonstrate that internal noise levels during the overheating condition with openable windows are not predicted to result in significant adverse effect.

The predicted worst-case external facade levels for the worst affected elevation of the proposed development (overlooking Jersey Street) are summarised below.

Table 8 Predicted external facade levels from 3D modelling

Location	$L_{Aeq,16hrs}$ (dB) day (0700-2300)	$L_{Aeq,8hrs}$ (dB) night- time (2300-0700)	Not normally exceeded L_{AFmax} (dB)
Level 1	56	48	71
Level 2	55	47	68
Level 3	54	47	66
Level 4	54	47	64
Level 5	53	47	63
Level 6	53	47	62
Level 7	51	46	57

The predicted worst-case internal levels for the worst affected elevation of the proposed development (overlooking Jersey Street) are summarised below.

Table 9 Predicted internal levels based on partially open window providing 13 dB of attenuation

Location	$L_{Aeq,16hrs}$ (dB) day (0700-2300)	$L_{Aeq,8hrs}$ (dB) night- time (2300-0700)	Not normally exceeded L_{AFmax} (dB)
Level 1	40	33	55
Level 2	39	31	52
Level 3	38	31	50
Level 4	38	31	48
Level 5	37	31	47
Level 6	37	31	46
Level 7	35	30	41

If dual aspect windows are required to open to a single room within an apartment to control over-heating, the overall internal noise level could increase compared to the values presented above.

The worst-case predicted L_{Aeq} values within the apartment are below the (AVO) SOAEL thresholds of L_{Aeq} 40 dB daytime and L_{Aeq} 35 dB during the night. As such, even if windows need to be open to control over-heating 'most of the time' during the summer months, the AVO SOAEL thresholds are met as illustrated in the graphs provided in Appendix G.

7.5 Approved Document O

The predicted levels of noise ingress set out in Section 7.4 as part of the AVO assessment are in line with those suggested by Approved Document O. As such, opening windows to control over-heating would be permissible under Approved Document O.

8 Commercial unit activity noise

The proposed development includes commercial units.

It is understood that tenant leases do not permit amplified sound, with the exception of background music within the commercial units.

8.1 Breakout limits

Manchester City Council require amplified sound egress to be 10 dB below the typical background noise level in octave bands outside the nearby noise sensitive premises. These limits are provided below based on the noise survey data:

Table 10 Maximum amplified sound egress limits

Location	Period	Maximum sound pressure level at 1m from noise sensitive premises (dB)						
		Octave-band centre frequency (Hz)						
		63	125	250	500	1k	2k	4k
Jersey Street/north	Daytime (07:00-23:00)	37	33	30	28	26	16	6
	Night (23:00-07:00)	35	30	26	24	21	12	3
Canal/south	Daytime (07:00-23:00)	34	27	26	23	22	13	5
	Night (23:00-07:00)	29	24	23	21	16	7	3

8.2 Noise transfer limits

Amplified sound transfer from the residential amenity space or commercial areas to adjacent apartments shall be controlled to meet NR 15 ($L_{eq,5mins}$).

Additionally, Manchester City Council state the following from Planning and Noise – Technical Guidance dated December 2015:

“Music noise levels in the 63Hz and 125Hz octave centre frequency bands (L_{eq}) should be controlled so as not to exceed (in habitable rooms) 47dB and 41dB (L_{eq}), respectively.”

8.3 Guidance on internal limits

Maximum internal amplified sound limits will need to be set in the commercial units using electronic limiters to ensure that the amplified sound egress limits are not exceeded. These should be finalised following pre-completion testing to establish the sound insulation provided.

At this stage, it is recommended that these areas have a sealed facade (no passive openings for ventilation purposes) with a minimum sound insulation performance of $R_w + C_{tr}$ 28 dB. A minimum floor/partition sound insulation performance of $D_{nT,w} + C_{tr}$ 53 dB is proposed between these spaces and the apartments.

Based on the proposed minimum standards of sound insulation for the floor and facades, and the proposed breakout/transfer criteria, guidance on maximum amplified sound limits in these areas.

Table 11 Guidance on maximum amplified sound limits in residential amenity area and commercial units

Period	Guidance on maximum internal sound pressure levels	
	$L_{Aeq,5mins}$ (dB)	
Daytime (07:00-23:00)	75	
Night-time (23:00-07:00)	70	

Internal sound pressure levels at 63 Hz and 125 Hz are to be capped at L_{eq} 65 dB during the day and L_{eq} 60 dB at night. Final amplified sound limits shall be set following pre-completion testing.

These limits would typically be suitable for commercial uses with background music only, as set out within the tenant leases.

If tenants wish to exceed these limits then enhancements will need to be provided such as the following, to ensure that the noise breakout and transfer limits set out in sections 8.2 and 8.3 are met:

- Use of lobbied entrance doors
- Sound insulating ceilings
- Linings to common structural elements
- Treatment to common building services routes

9 Deliveries/collections

It is recommended that deliveries and collections associated with the commercial units within the development be limited to be during the daytime only to minimise the risk of noise disturbance.

10 Conclusion

Environmental noise surveys have been carried out at the site between 5 March 2021 and 8 March 2021 and 3 September 2021 and 7 September 2021. The dominant noise sources observed at the site during the survey were from road traffic noise. The representative background sound levels measured during the survey were $L_{A90,15min}$ 42 dB during the daytime and $L_{A90,15min}$ 36 dB at night at position A, and $L_{A90,15min}$ 36 dB during the daytime and $L_{A90,15min}$ 32 dB at night at position B.

Based on the requirements of Manchester City Council, plant limits have been set such that the cumulative noise level at 1 m from the worst affected windows of the nearby noise sensitive premises is to be at least 5 dB below the typical background noise levels (taking into account facade effects). These limits are cumulative and apply with all plant operation under normal conditions. If plant items contain tonal or attention catching features, a penalty based on the type and impact of those features will be applied, and the limits will be more stringent than those set.

The data collected has been used to determine appropriate operational noise egress limits and sound insulation requirements for the building envelope, and inform the overheating strategy.

Appendix A

Survey details

Equipment

The unattended and attended noise measurements were taken using a Rion NL-52 sound level meter.

Calibration details for the equipment used during the survey are provided in Table A1.

Table A1 Equipment calibration data

Equipment description	Type/serial number	Manufacturer	Calibration expiry	Calibration certification number
Sound level meter	NL-52/01143564	Rion	15 Dec 22	TCRT20/1738
Microphone	UC-59/10153	Rion	15 Dec 22	TCRT20/1738
Pre-amp	NH-25/43581	Rion	15 Dec 22	TCRT20/1738
Calibrator	NC-74/34257023	Rion	14 Dec 22	TCRT20/1736
Sound level meter	NL-52/00932326	Rion	16 Mar 23	TCRT21/1182
Microphone	UC-59/05549	Rion	16 Mar 23	TCRT21/1182
Pre-amp	NH-25/32354	Rion	16 Mar 23	TCRT21/1182
Calibrator	NC-74/34125432	Rion	16 Mar 23	TCRT21/1181

Calibration of the meters used for the measurements is traceable to national standards. Calibration certificates for the sound level meters used in this survey are available upon request.

Calibration checks were carried out on the meters and their measurement chains at the beginning and end of the survey. No significant calibration deviation occurred.

Noise indices

Noise indices recorded included the following:

- $L_{Aeq,T}$ The A-weighted equivalent continuous sound pressure level over a period of time, T.
- $L_{AFmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a fast time weighting.
- $L_{ASmax,T}$ The A-weighted maximum sound pressure level that occurred during a given period, T, with a slow time weighting.
- $L_{A90,T}$ The A-weighted sound pressure level exceeded for 90% of the measurement period. Indicative of the background sound level.

Sound pressure level measurements are normally taken with an A-weighting (denoted by a subscript 'A', eg L_{A90}) to approximate the frequency response of the human ear.

A more detailed explanation of these quantities can be found in BS7445: Part 1: 2003 *Description and measurement of environmental noise, Part 1. Guide to quantities and procedures*.

Weather conditions

During the attended noise measurements, the weather was generally clear and dry, and no rain occurred. Wind speeds were less than 5 m/s.

During the unattended noise measurements at position A, weather reports for the area indicated that temperatures varied between 12°C during the night and 17°C during the day and wind speed was less than 5 m/s. The weather was generally overcast with no rainfall occurring.

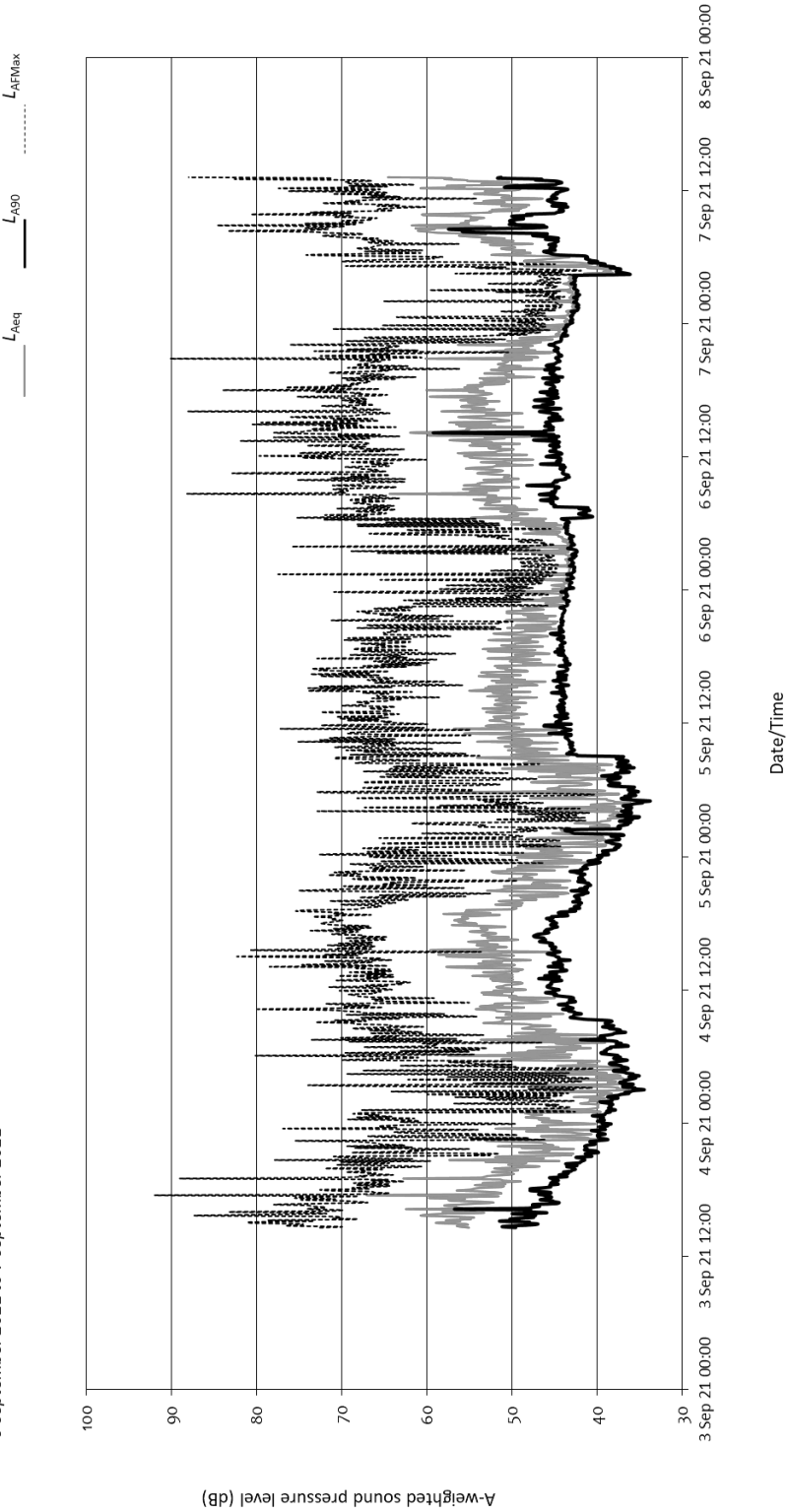
During the unattended noise measurements at position B, weather reports for the area indicated that temperatures varied between -3°C at night and 12°C during the day, and the wind speed was less than 4 m/s. There was occasional light rain on Monday 8 March 2021.

These weather conditions are considered suitable for obtaining representative measurements.

Appendix B

Results of unattended measurements at position A

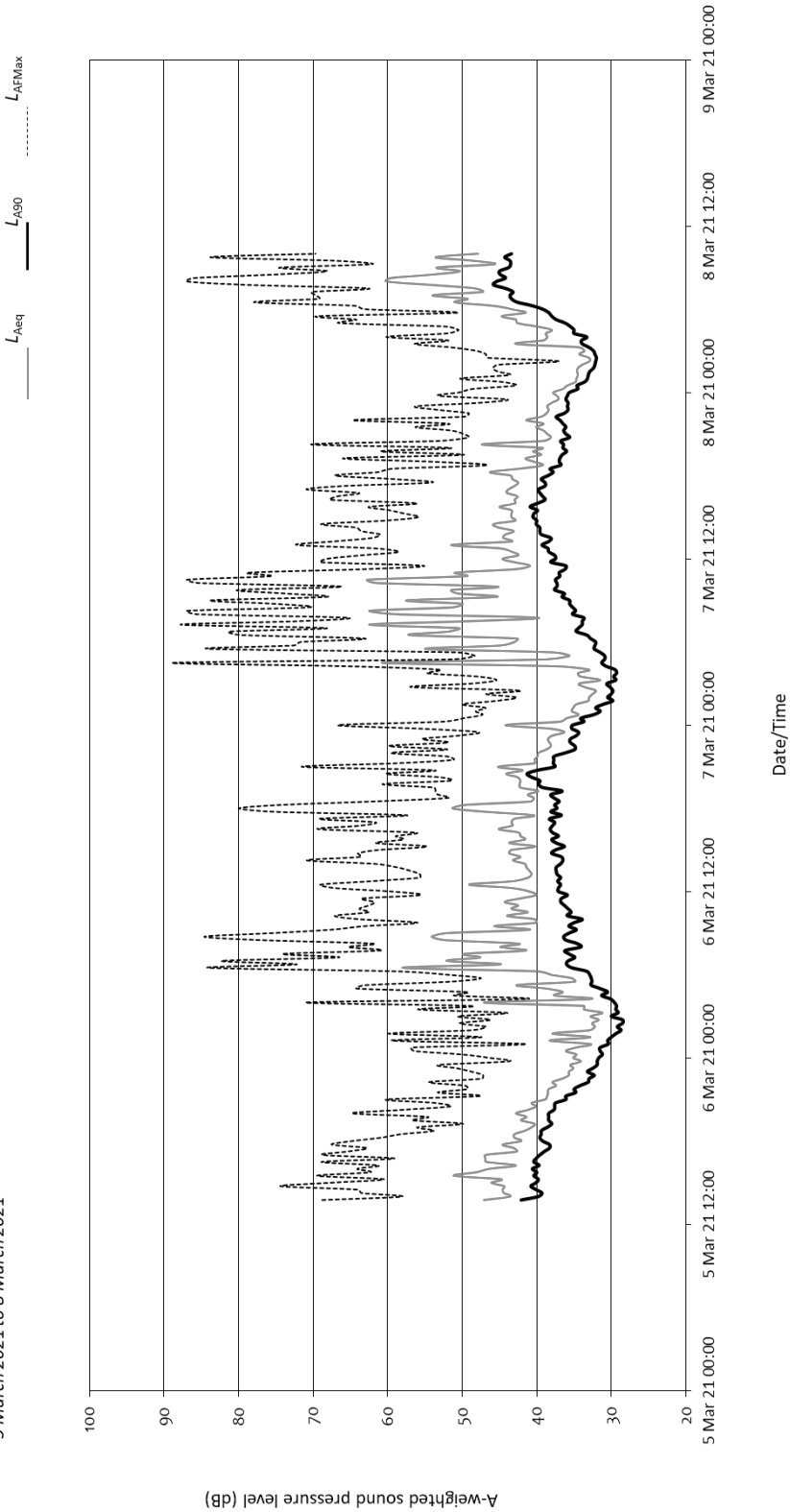
Jersey Wharf, Manchester Life
Results of noise logging survey
3 September 2021 to 7 September 2021



Appendix C

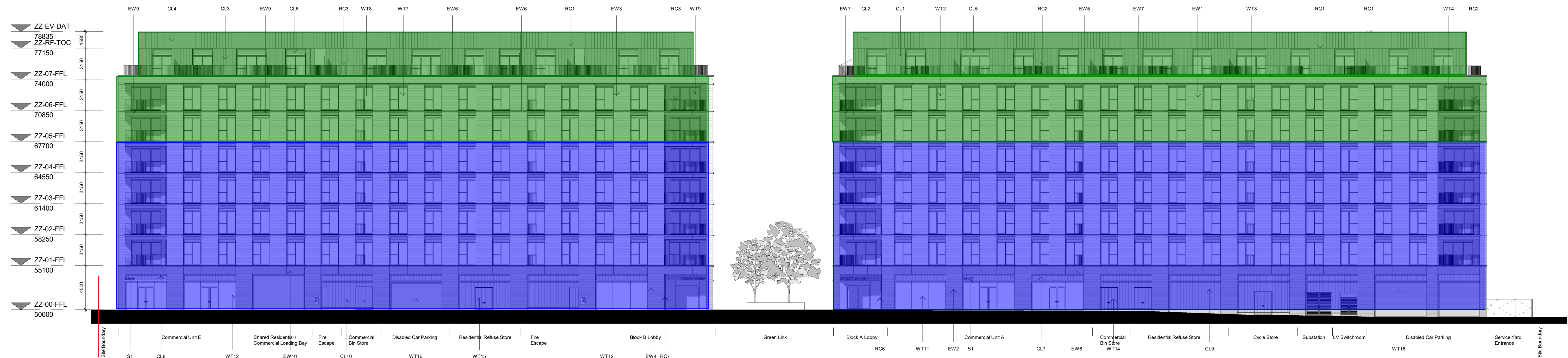
Results of unattended measurements at position B

Jersey Wharf, Manchester Life
Results of noise logging survey at position B
5 March 2021 to 8 March 2021



Appendix D

External noise levels



Elevation AA_Planning

1 : 200

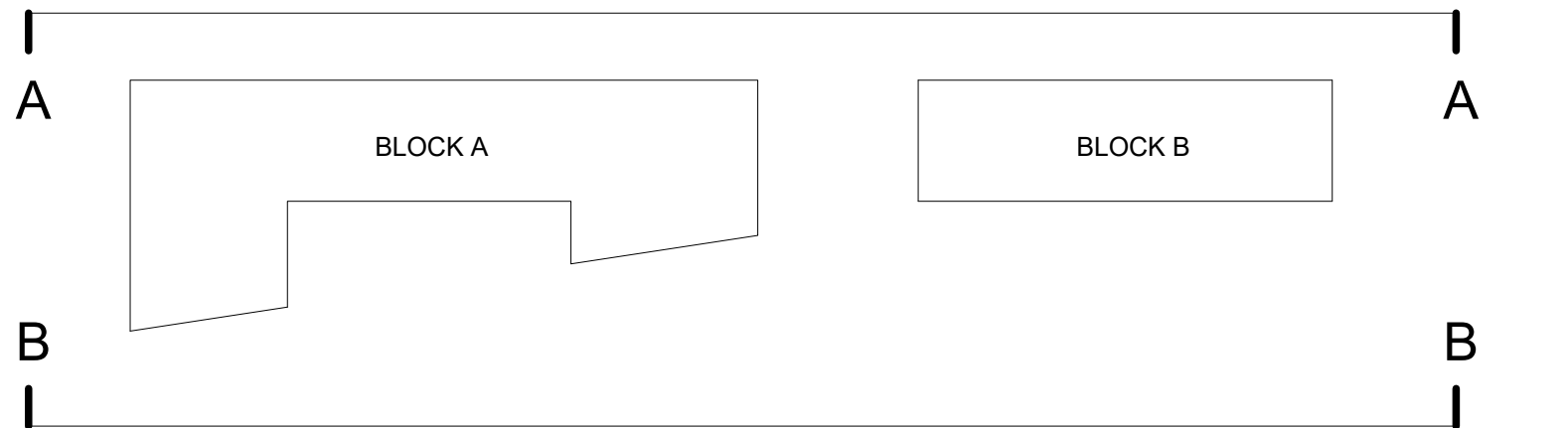


Elevation BB_Planning

1 : 200

MASONRY		CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour	WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
EW1	Light terracotta brick, stretcher bond, light coloured mortar.	CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour	WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.	CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour	WT13	PPC loured aluminium door. Frame colour to match WT1
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.	WINDOWS AND DOORS		WT14	Aluminium door with inset cladding panel to match CL9.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.	WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	WT15	Aluminium door with inset cladding panel to match CL10.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.	WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	WT16	Roller shutter door to vehicle garage. PPC to match windows frames.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.	WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL1. Window reveal is 185mm from external face of brickwork.	RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.	WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick. Fluted concrete form-work to face.	WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.	WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC3	PPC metal railing balustrade. Dark terracotta colour
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.	WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour
CLADDING		WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC5	PPC aluminium soffit panel. Dark terracotta colour
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour	WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC6	PPC aluminium rainwater pipe. Light terracotta colour
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour	WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC7	PPC aluminium rainwater pipe. Dark terracotta colour
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour			RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour			RC9	Privacy screen
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour			RC10	Louredd panel
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour			SIGNAGE	
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour			S1	PPC aluminium shop sign. Colour TBC
				S2	Large scale painted sign on brickwork
				MISCELLANEOUS	
				M1	Bat box

Title	Predicted daytime facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	
Predicted daytime facade noise levels L_{Aeq} (dB)	
	54-56
	51-53
	47-49
SANDY BROWN <i>Consultants in Acoustics, Noise & Vibration</i>	





Elevation AA_Planning

1 : 200

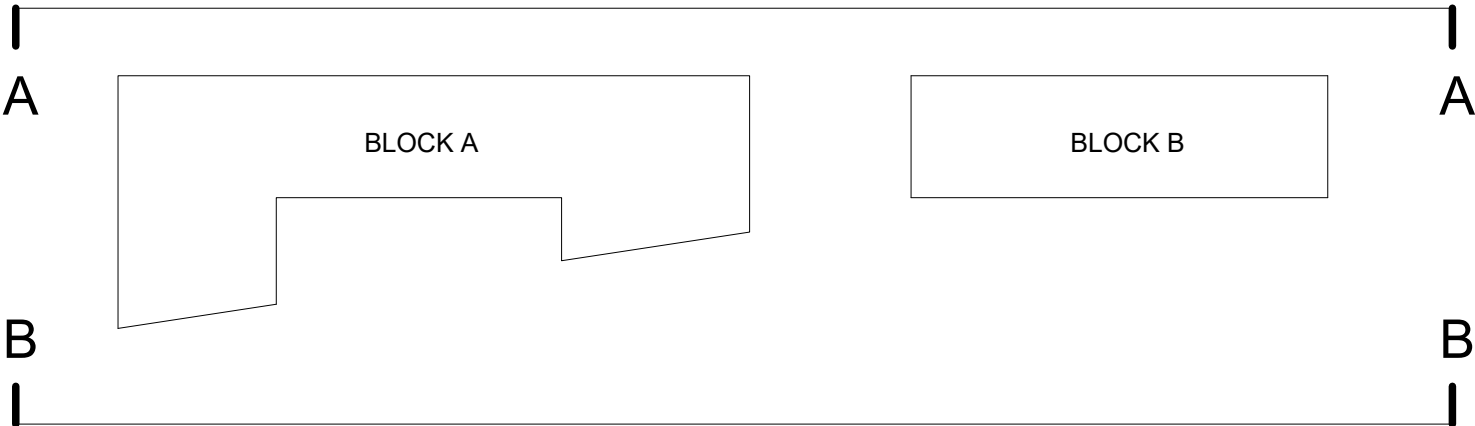


Elevation BB_Planning

1 : 200

MASONRY		CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour	WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	
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EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.	CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour	WT13	PPC loured aluminium door. Frame colour to match WT1	
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.	WINDOWS AND DOORS			WT14	Aluminium door with inset cladding panel to match CL9.
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EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.	WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	WT16	Roller shutter door to vehicle garage. PPC to match windows frames.	
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.	WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL1. Window reveal is 185mm from external face of brickwork.	RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES		
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.	WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding	
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick. Fluted concrete form-work to face.	WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour	
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.	WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC3	PPC metal railing balustrade. Dark terracotta colour	
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.	WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour	
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CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour	WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC6	PPC aluminium rainwater pipe. Light terracotta colour	
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour	WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC7	PPC aluminium rainwater pipe. Dark terracotta colour	
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CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour			SIGNAGE		
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour			S1	PPC aluminium shop sign. Colour TBC	
				S2	Large scale painted sign on brickwork	
				MISCELLANEOUS		
				M1	Bat box	

Title	Predicted night-time facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	
	54-56
	51-53
	47-49
Predicted night-time facade noise levels L_{Aeq} (dB)	
	54-56
	51-53
	47-49
SANDY BROWN	
Consultants in Acoustics, Noise & Vibration	





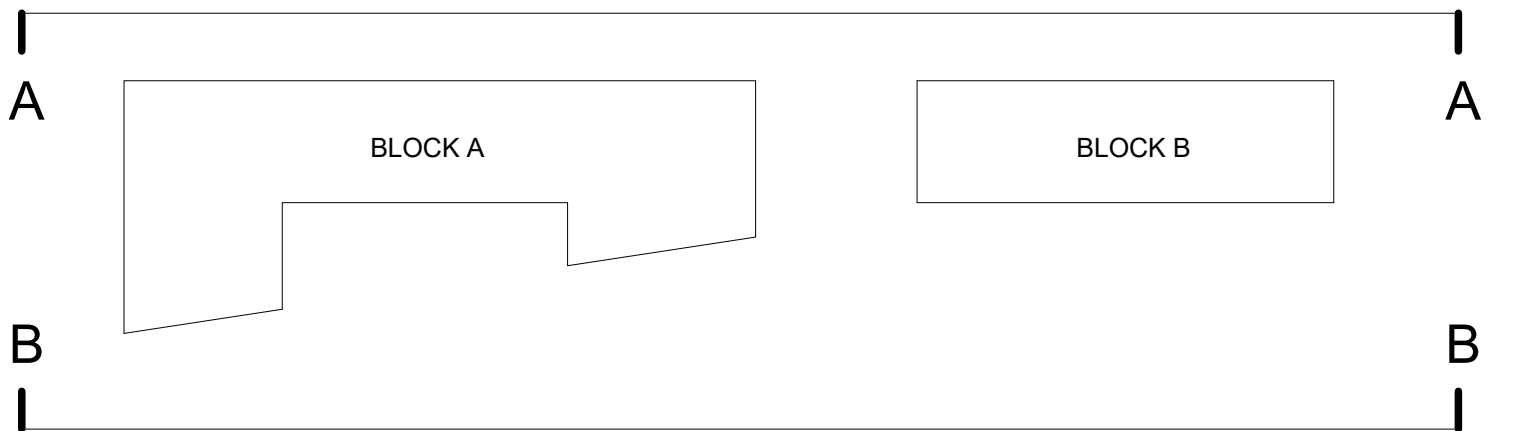
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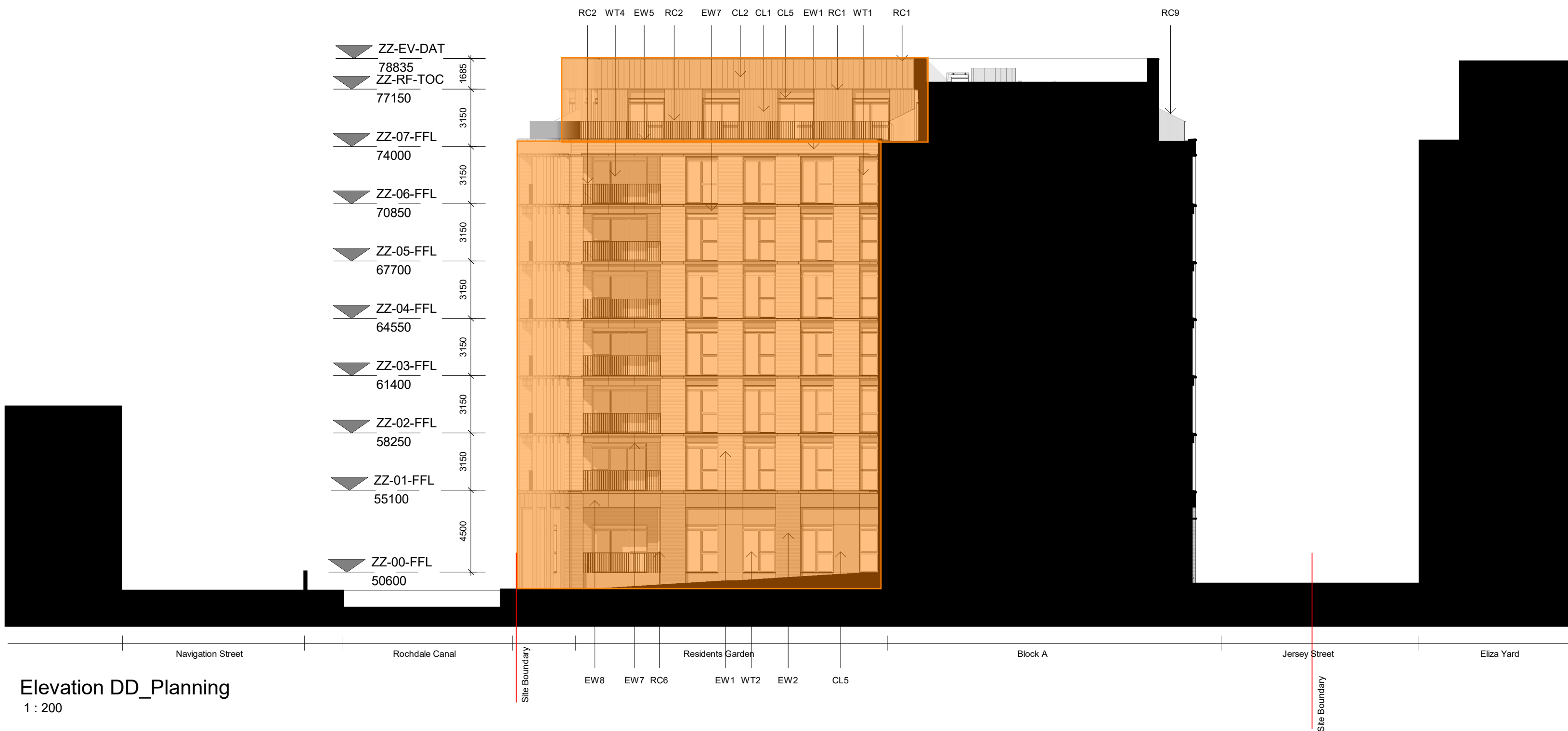


Elevation BB_Planning
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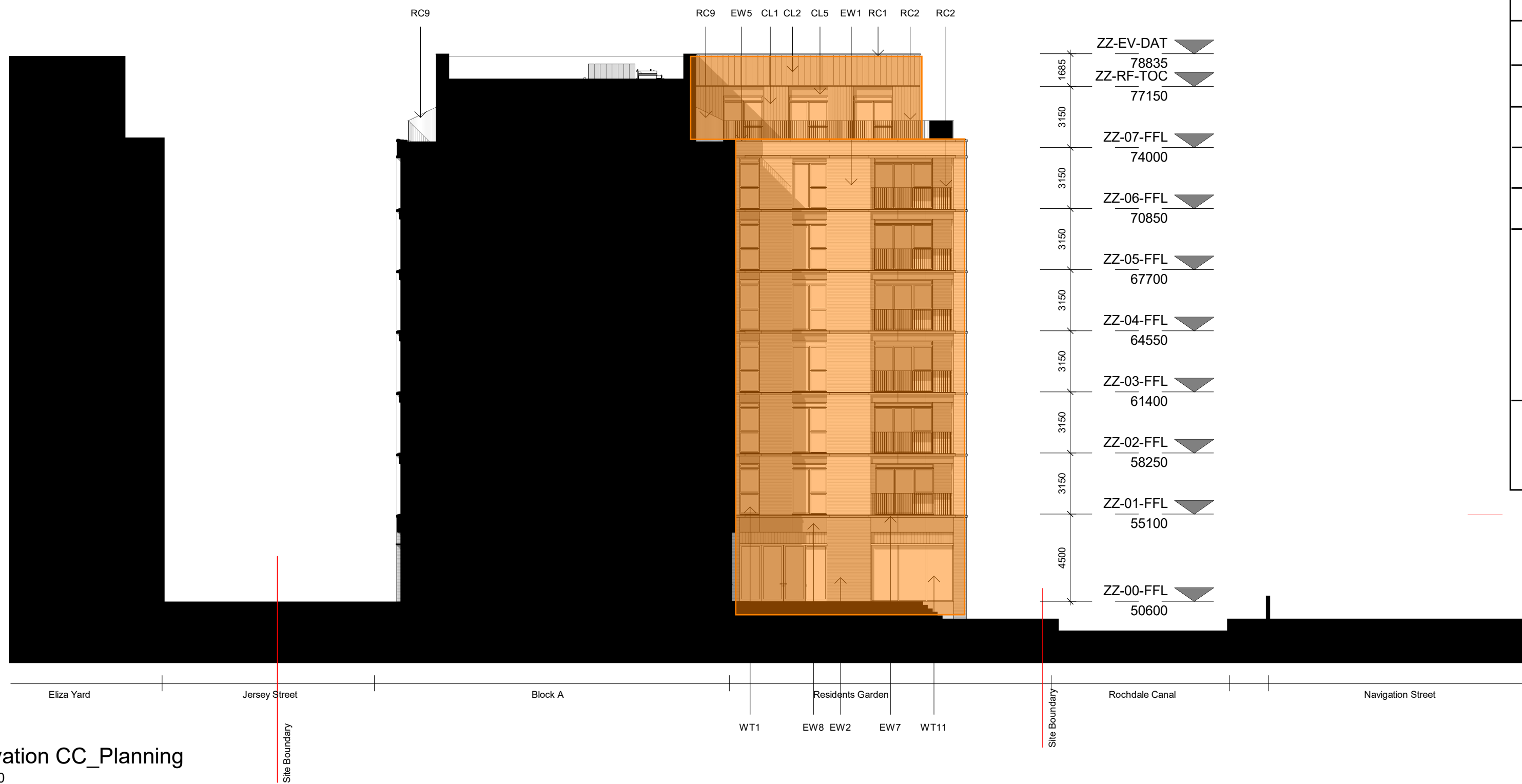
MASONRY		CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour	WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
EW1	Light terracotta brick, stretcher bond, light coloured mortar.	CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour	WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.	CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour	WT13	PPC loured aluminium door. Frame colour to match WT1
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.	WINDOWS AND DOORS		WT14	Aluminium door with inset cladding panel to match CL9.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.	WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	WT15	Aluminium door with inset cladding panel to match CL10.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.	WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	WT16	Roller shutter door to vehicle garage. PPC to match windows frames.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.	WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL1. Window reveal is 185mm from external face of brickwork.	RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.	WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.	WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.	WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC3	PPC metal railing balustrade. Dark terracotta colour
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.	WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour
CLADDING		WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC5	PPC aluminium soffit panel. Dark terracotta colour
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour	WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC6	PPC aluminium rainwater pipe. Light terracotta colour
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour	WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	RC7	PPC aluminium rainwater pipe. Dark terracotta colour
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour			RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour			RC9	Privacy screen
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour			RC10	Loured panel
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour			SIGNAGE	
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour			S1	PPC aluminium shop sign. Colour TBC
				S2	Large scale painted sign on brickwork
				MISCELLANEOUS	
				M1	Bat box

Title	Predicted night-time facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	L_{AFmax} (dB) not normally exceeded at night time
	68-71
	57-67





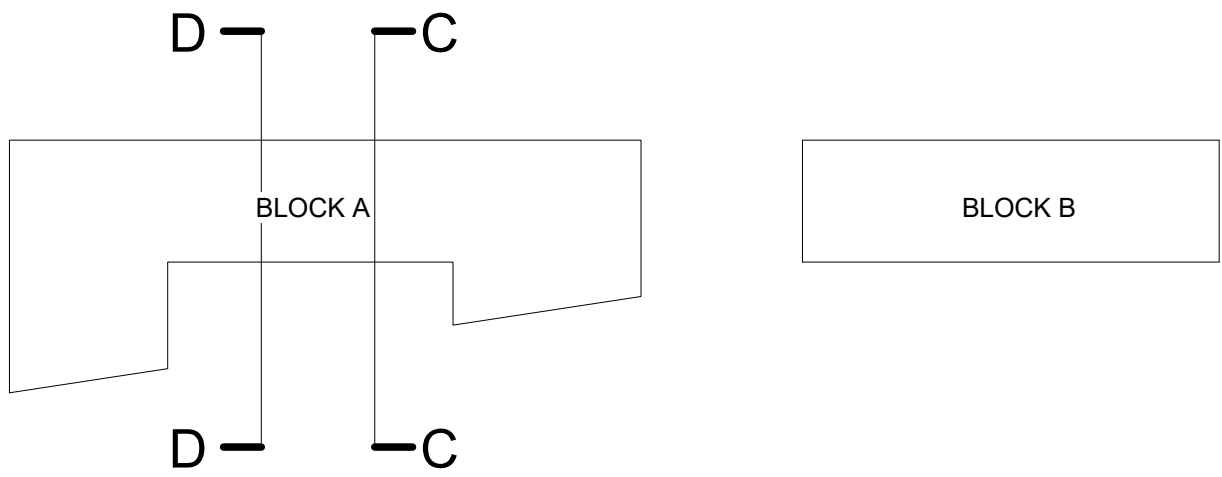
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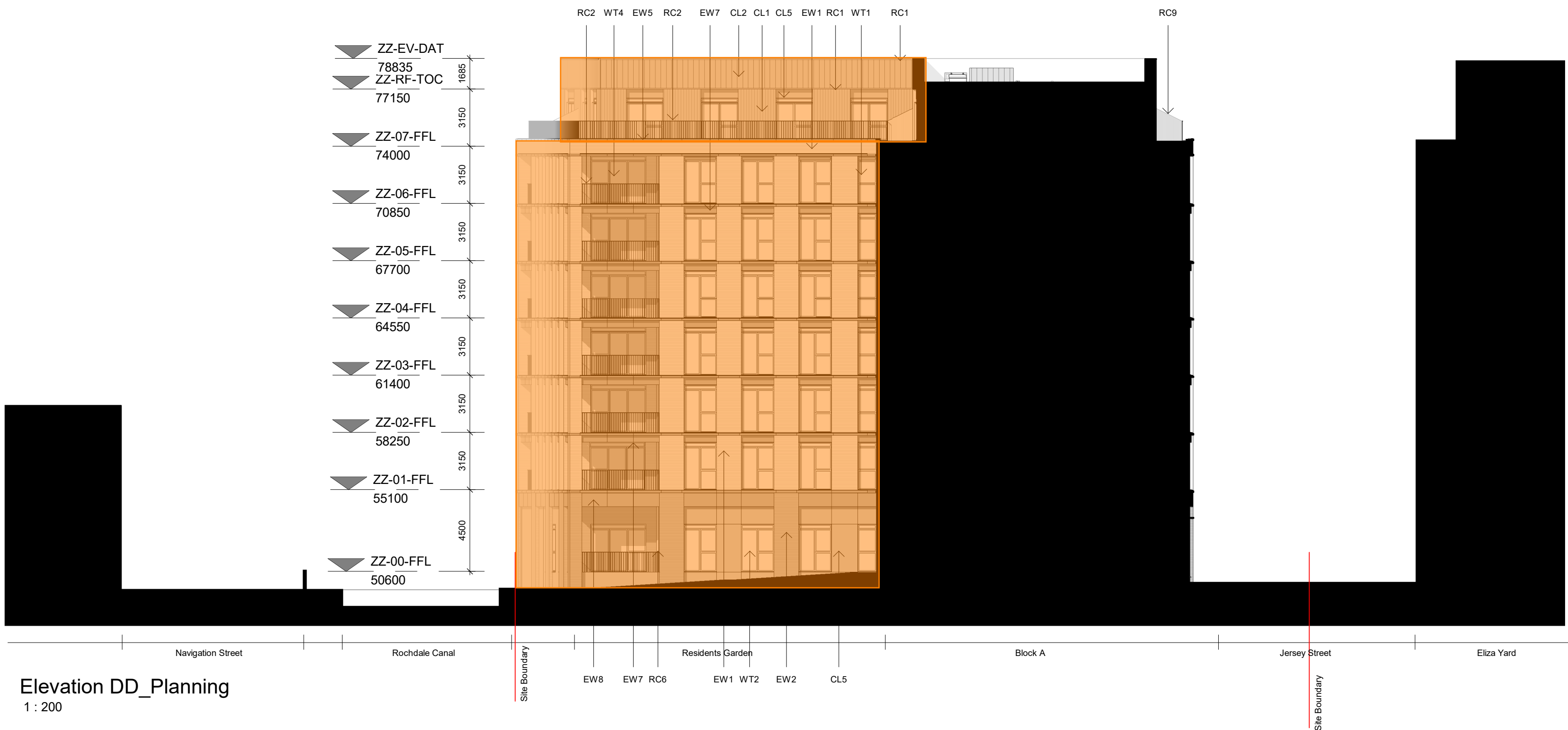


Elevation CC_Planning
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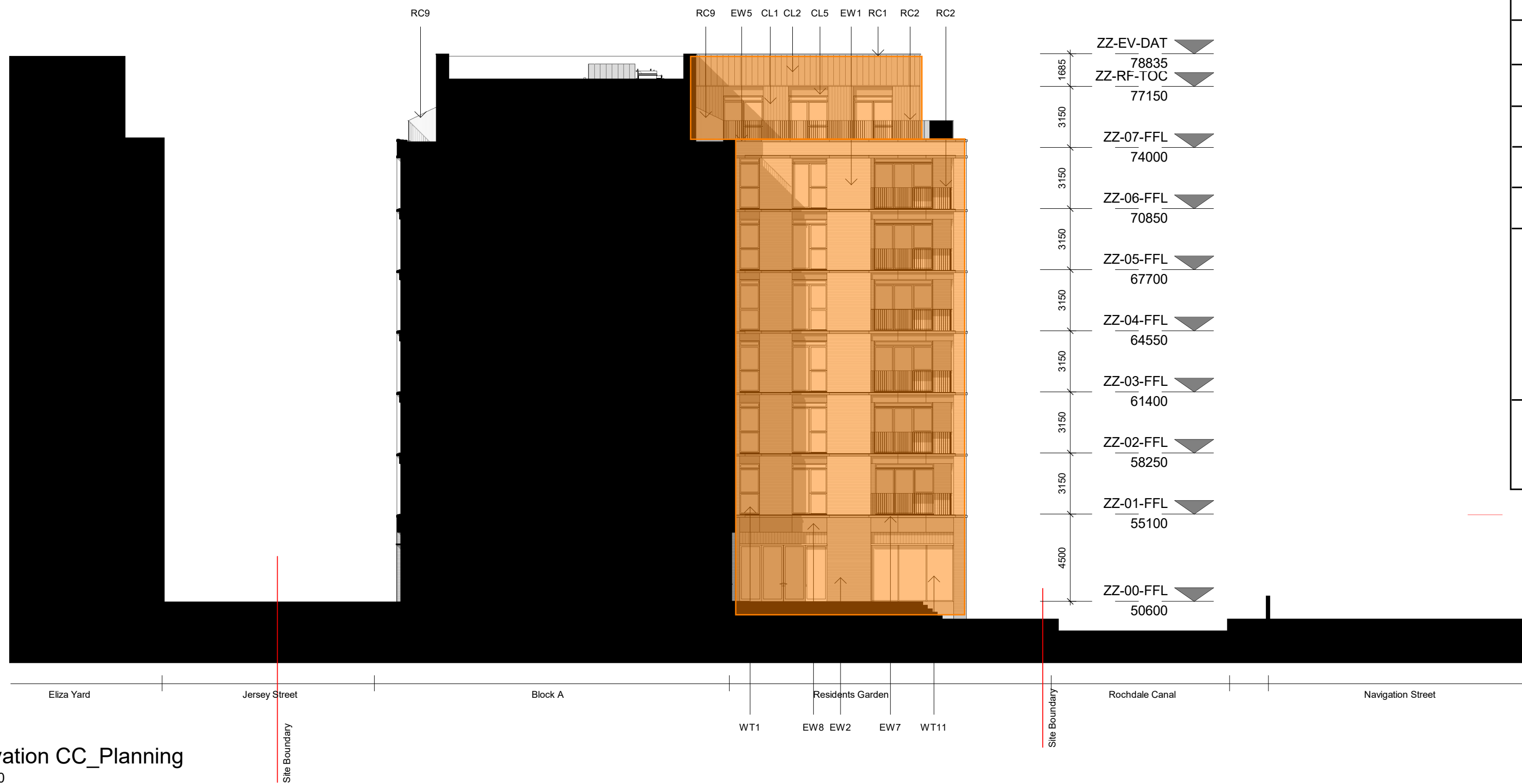
MASONRY	
EW1	Light terracotta brick, stretcher bond, light coloured mortar.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick. Fluted concrete form-work to face.
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.
CLADDING	
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour.
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour.
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour.
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour.
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour.
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour.
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour.
CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour.
CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour.
CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour.
WINDOWS AND DOORS	
WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT13	PPC loured aluminium door. Frame colour to match WT1.
WT14	Aluminium door with inset cladding panel to match CL3.
WT15	Aluminium door with inset cladding panel to match CL10.
WT16	Roller shutter door to vehicle garage. PPC to match windows frames.
RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	
RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding.
RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour.
RC3	PPC metal railing balustrade. Dark terracotta colour.
RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour.
RC5	PPC aluminium soffit panel. Dark terracotta colour.
RC6	PPC aluminium rainwater pipe. Light terracotta colour.
RC7	PPC aluminium rainwater pipe. Dark terracotta colour.
RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding.
RC9	Privacy screen.
RC10	Loured panel.
SIGNAGE	
S1	PPC aluminium shop sign. Colour TBC.
S2	Large scale painted sign on brickwork.
MISCELLANEOUS	
M1	Bat Box.

Title	Predicted daytime facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	Predicted daytime facade noise levels L_{Aeq} (dB) 54-56 51-53 47-49
SANDY BROWN Consultants in Acoustics, Noise & Vibration	





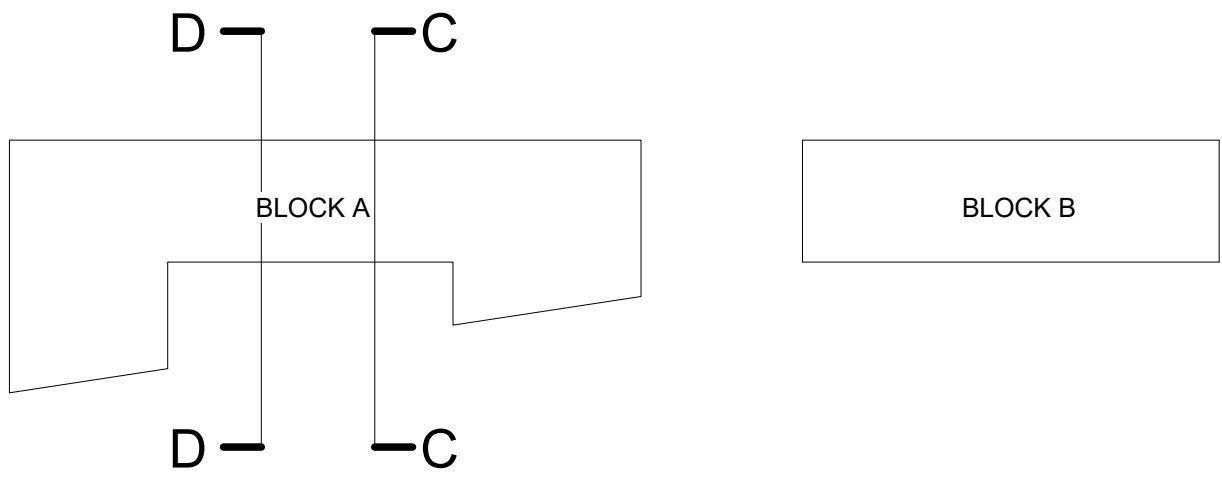
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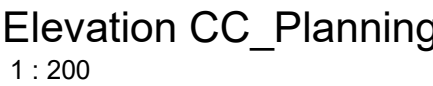


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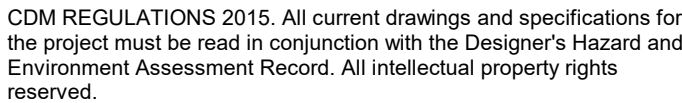
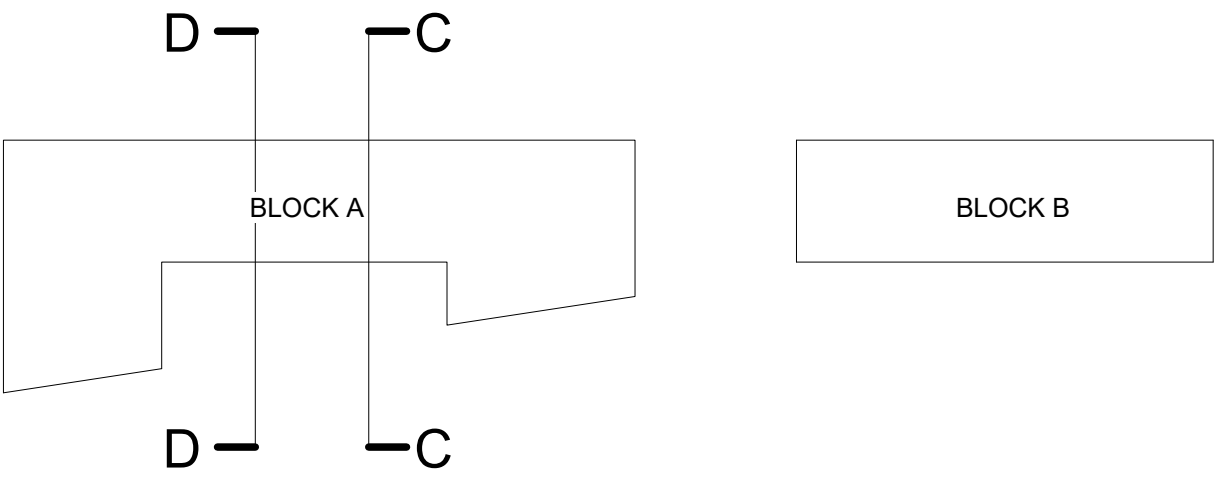
MASONRY	
EW1	Light terracotta brick, stretcher bond, light coloured mortar.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick. Fluted concrete form-work to face.
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.
CLADDING	
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour.
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour.
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour.
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour.
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour.
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour.
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour.
CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour.
CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour.
CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour.
WINDOWS AND DOORS	
WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT13	PPC loured aluminium door. Frame colour to match WT1.
WT14	Aluminium door with inset cladding panel to match CL3.
WT15	Aluminium door with inset cladding panel to match CL10.
WT16	Roller shutter door to vehicle garage. PPC to match windows frames.
RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	
RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding.
RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour.
RC3	PPC metal railing balustrade. Dark terracotta colour.
RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour.
RC5	PPC aluminium soffit panel. Dark terracotta colour.
RC6	PPC aluminium rainwater pipe. Light terracotta colour.
RC7	PPC aluminium rainwater pipe. Dark terracotta colour.
RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding.
RC9	Privacy screen.
RC10	Loured panel.
SIGNAGE	
S1	PPC aluminium shop sign. Colour TBC.
S2	Large scale painted sign on brickwork.
MISCELLANEOUS	
M1	Bat Box.

Title	Predicted night-time facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	Predicted night-time facade noise levels L_{Aeq} (dB) 54-56 51-53 47-49
SANDY BROWN Consultants in Acoustics, Noise & Vibration	





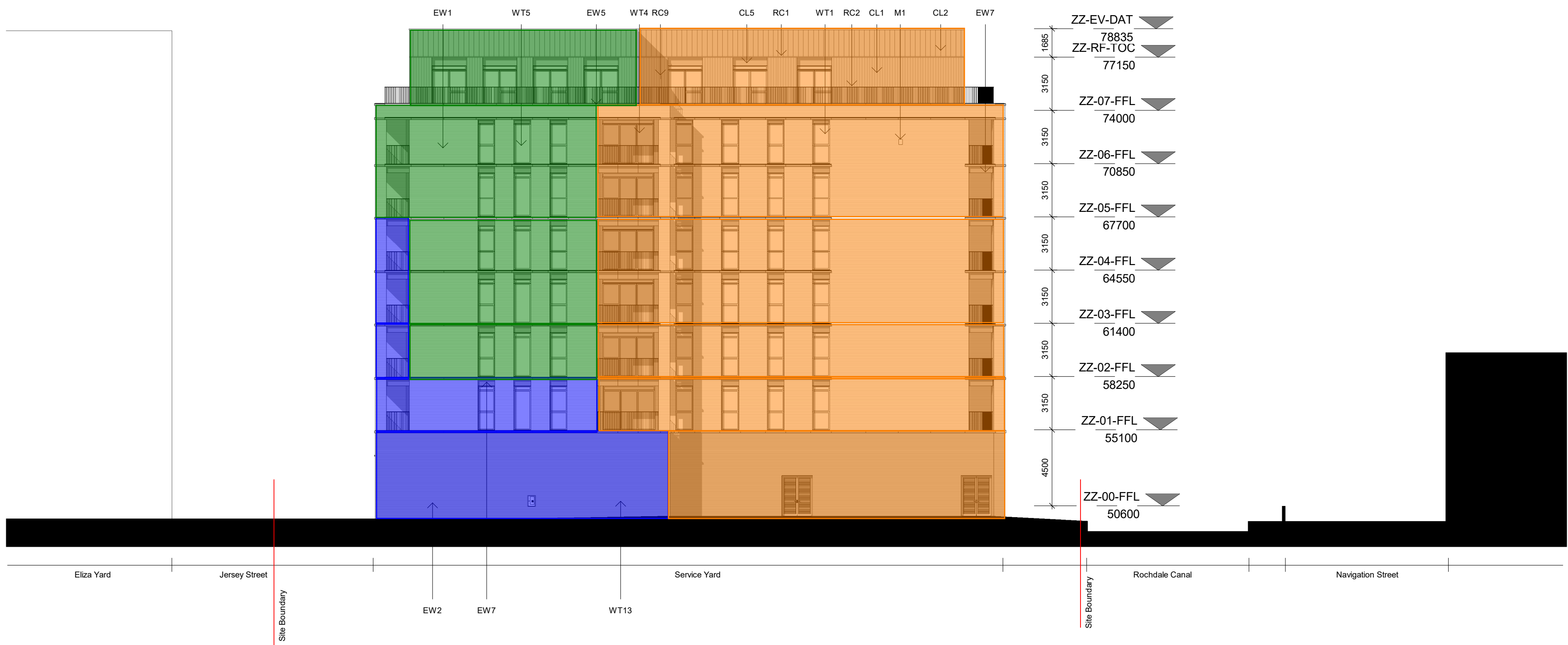
EROSION	EW1	Light terracotta brick, stretcher bond, light coloured mortar.
	EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
	EW3	Dark terracotta brick, stretcher bond, red coloured mortar.
	EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
	EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.
	EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.
	EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
	EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick. Fluted concrete form-work to face.
	EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.
	EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.
CLADDING	CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
	CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour
	CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
	CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour
	CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour
	CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour
	CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
	CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
	CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour
	CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour
WINDOWS AND DOORS	WT1	Aluminium window with fixed lower pane and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
	WT2	Aluminium window. Sash 1 is fixed lower pane and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
	WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL1. Window reveal is 185mm from external face of brickwork.
	WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pane and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
	WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
	WT6	Aluminium window with fixed lower pane and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
	WT7	Aluminium window. Sash 1 is fixed lower pane and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
	WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL3. Window reveal is 185mm from external face of brickwork.
	WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pane and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
	WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.	
WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.	
WT13	PPC boved aluminium door. Frame colour to match WT1	
WT14	Aluminium door with inset cladding panel to match CL9.	
WT15	Aluminium door with inset cladding panel to match CL10.	
WT16	Roller shutter door to vehicle garage. PPC to match windows frames.	
RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding
	RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour
	RC3	PPC metal railing balustrade. Dark terracotta colour
	RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour
	RC5	PPC aluminium soffit panel. Dark terracotta colour
	RC6	PPC aluminium rainwater pipe. Light terracotta colour
	RC7	PPC aluminium rainwater pipe. Dark terracotta colour
	RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding
	RC9	Privacy screen
	RC10	Louvered panel
SIGNAGE	S1	PPC aluminium shop sign. Colour TBC
	S2	Large scale painted sign on brickwork
MISCELLANEOUS	M1	Bat Box



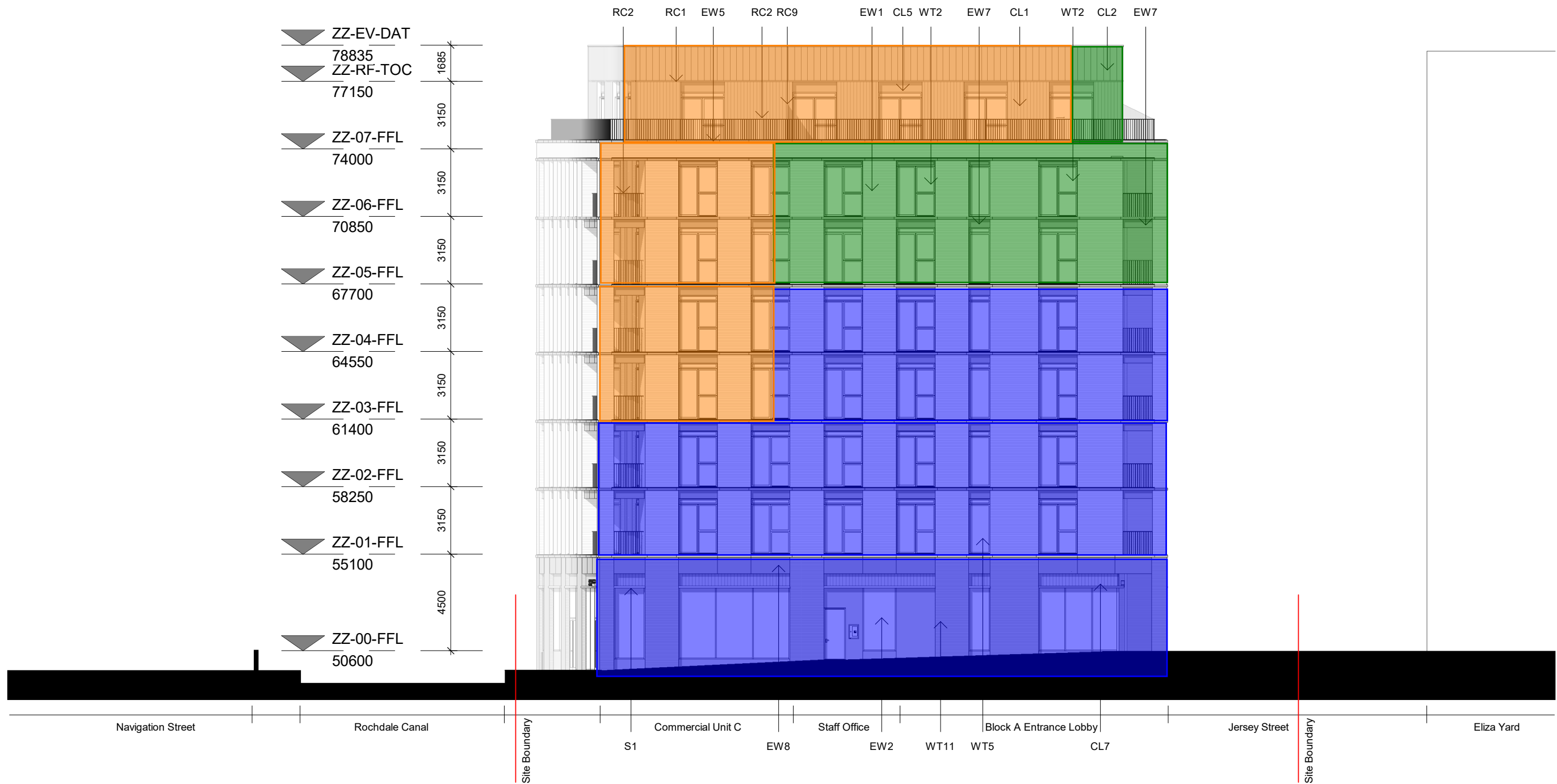
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SK	AH	Checked	AH
		Date	11/29/21
		Scale @ A1	As indicated

Project	Origin	Volume	Level	Type	Role	Number
JWA -	PRP -	A1 -	ZZ -	DR -	A -	002301
Revision			Status			
A -			PLANNING ISSUE -			





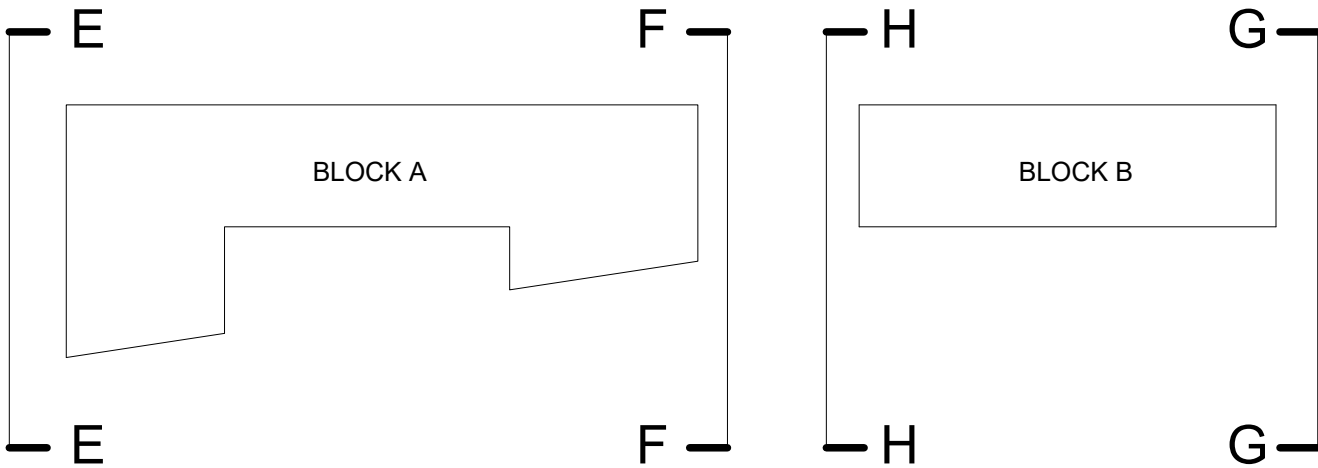
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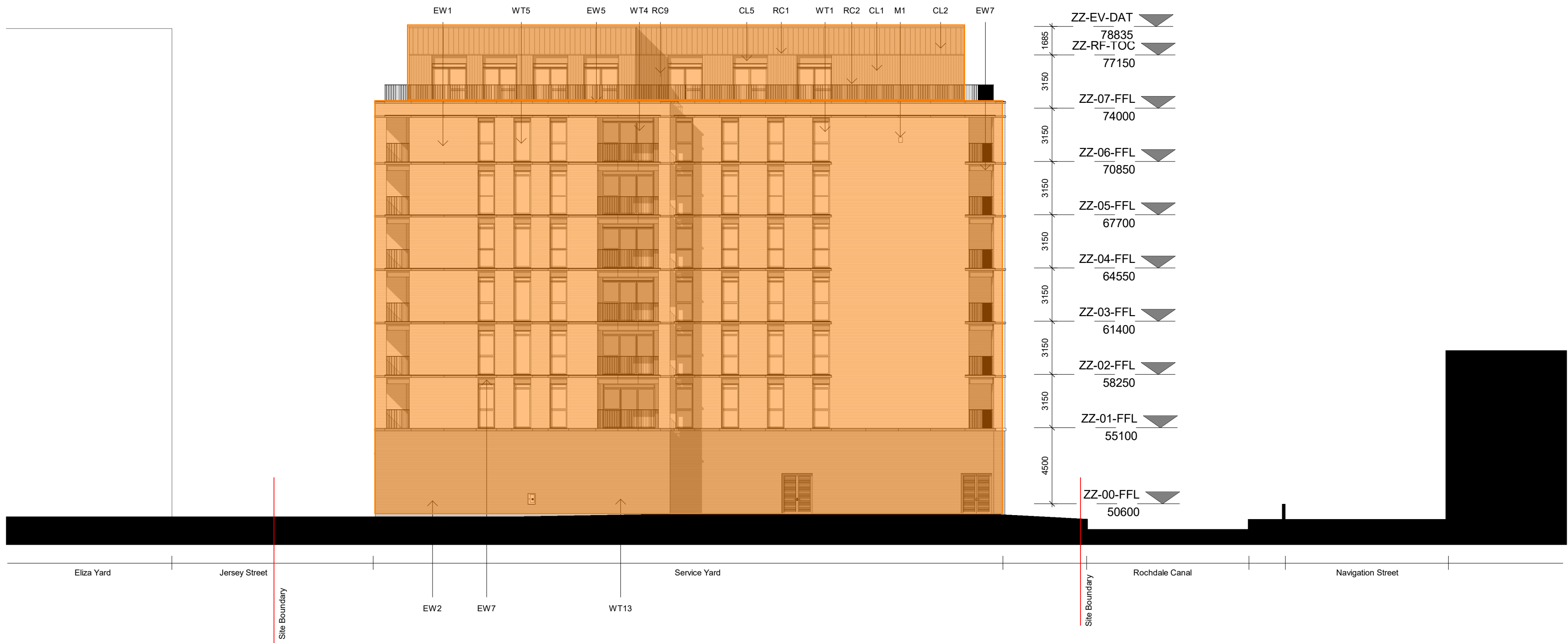


Elevation FF_Planning
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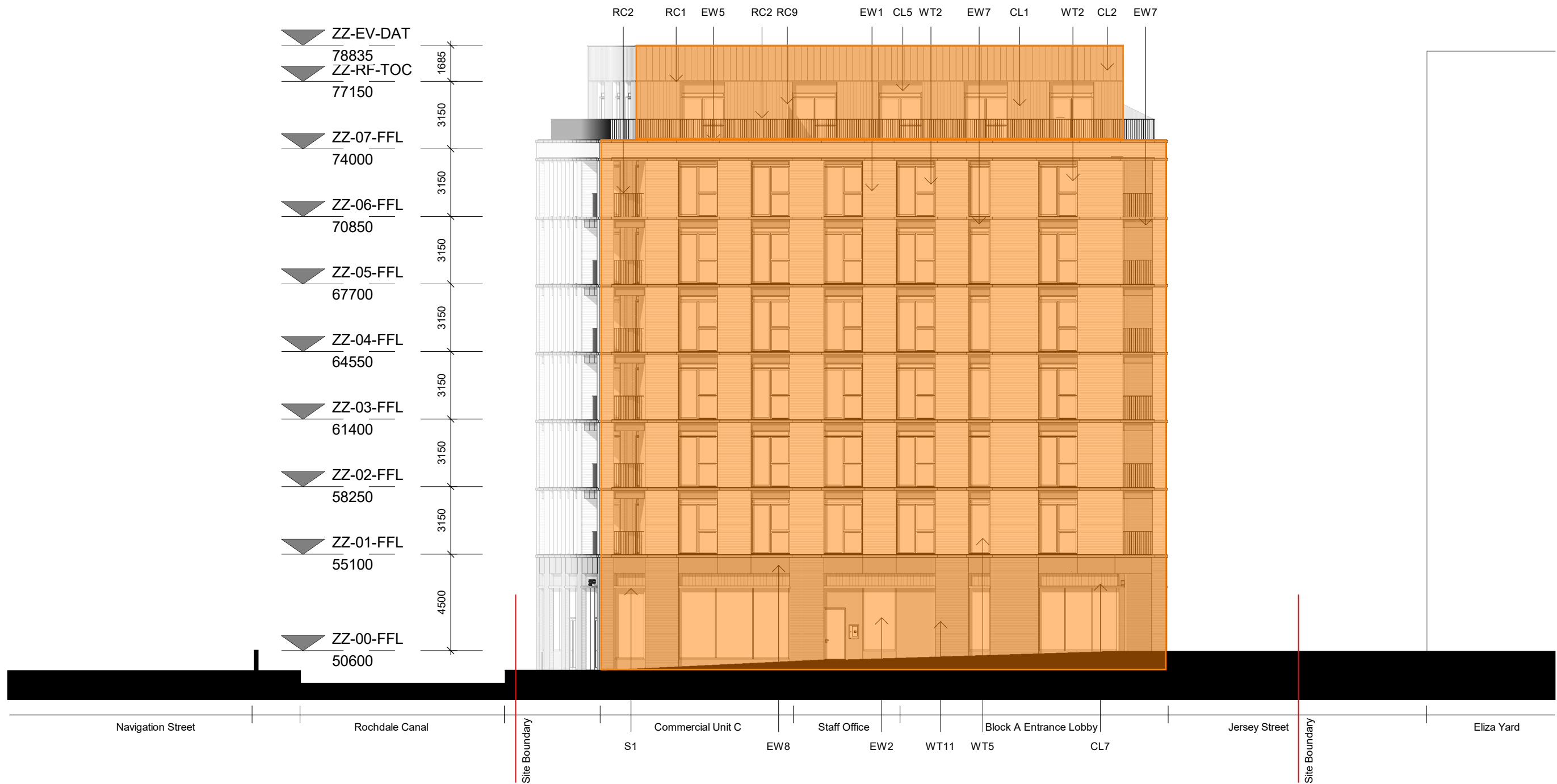
MASONRY	
EW1	Light terracotta brick, stretcher bond, light coloured mortar.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick. Fluted concrete form-work to face.
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.
CLADDING	
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour
CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour
WINDOWS AND DOORS	
WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT9	Aluminium window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT13	PPC loured aluminium door. Frame colour to match WT1
WT14	Aluminium door with inset cladding panel to match CL9.
WT15	Aluminium door with inset cladding panel to match CL10.
WT16	Roller shutter door to vehicle garage. PPC to match windows frames.
RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	
RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding
RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour
RC3	PPC metal railing balustrade. Dark terracotta colour
RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour
RC5	PPC aluminium soffit panel. Dark terracotta colour
RC6	PPC aluminium rainwater pipe. Light terracotta colour
RC7	PPC aluminium rainwater pipe. Dark terracotta colour
RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding
RC9	Privacy screen
RC10	Louved panel
SIGNAGE	
S1	PPC aluminium shop sign. Colour TBC
S2	Large scale painted sign on brickwork
MISCELLANEOUS	
M1	Bat Box

Title	Predicted daytime facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	Predicted daytime facade noise levels L_{Aeq} (dB) 54-56 51-53 47-49
SANDY BROWN Consultants in Acoustics, Noise & Vibration	





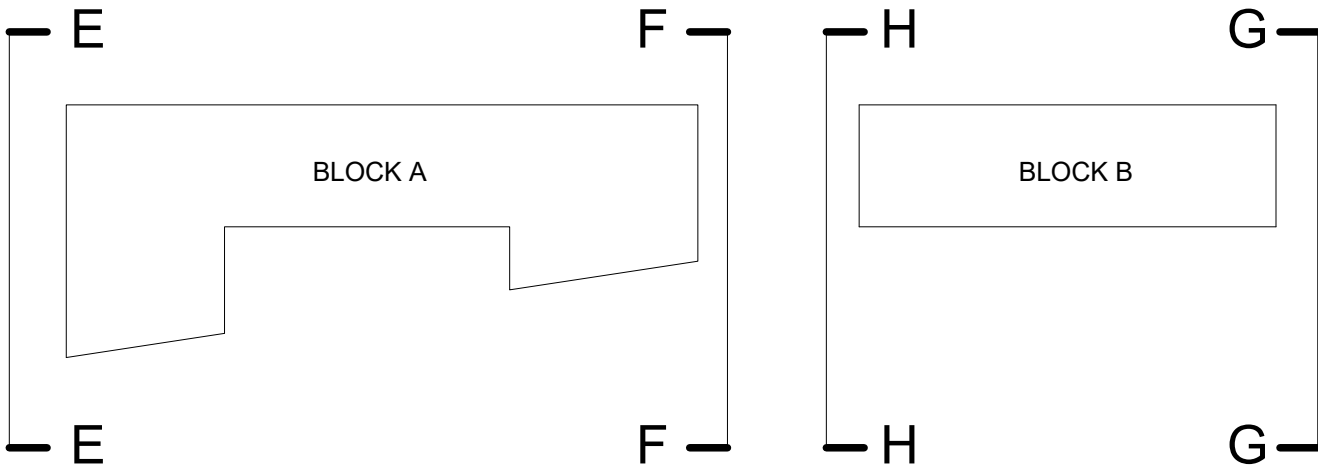
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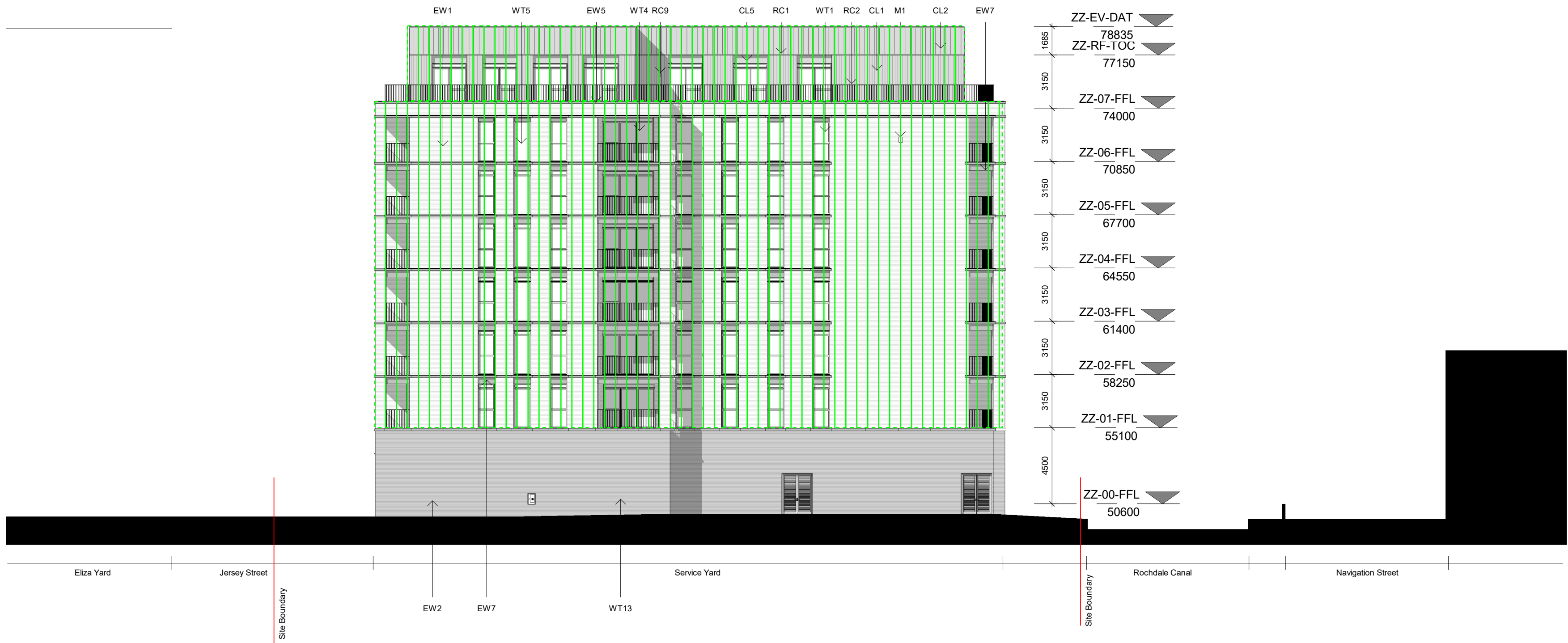


Elevation FF_Planning
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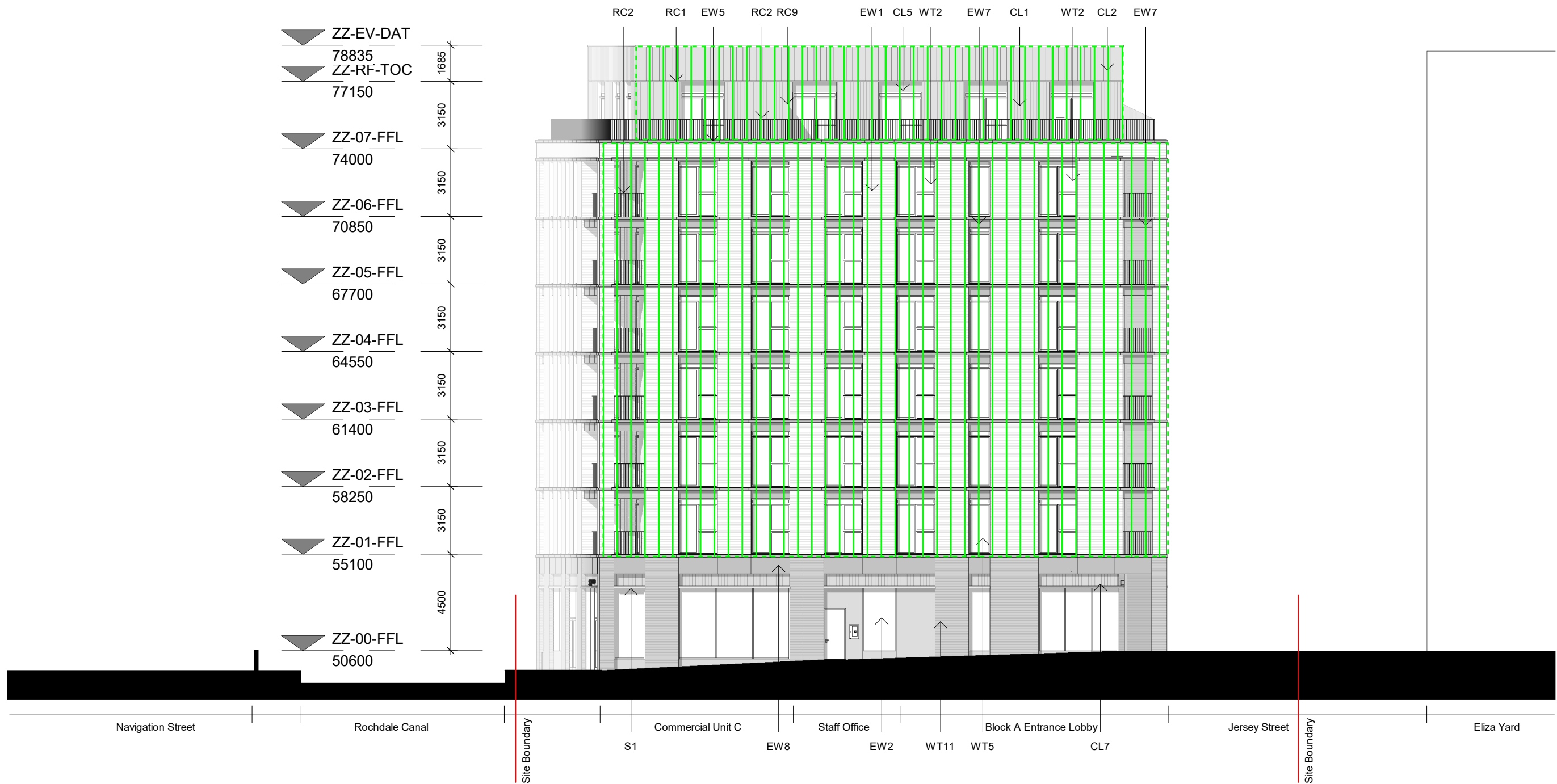
MASONRY	
EW1	Light terracotta brick, stretcher bond, light coloured mortar.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick. Fluted concrete form-work to face.
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.
CLADDING	
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour
CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour
WINDOWS AND DOORS	
WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT13	PPC louvred aluminium door. Frame colour to match WT1
WT14	Aluminium door with inset cladding panel to match CL9.
WT15	Aluminium door with inset cladding panel to match CL10.
WT16	Roller shutter door to vehicle garage. PPC to match windows frames.
RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	
RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding
RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour
RC3	PPC metal railing balustrade. Dark terracotta colour
RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour
RC5	PPC aluminium soffit panel. Dark terracotta colour
RC6	PPC aluminium rainwater pipe. Light terracotta colour
RC7	PPC aluminium rainwater pipe. Dark terracotta colour
RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding
RC9	Privacy screen
RC10	Louvred panel
SIGNAGE	
S1	PPC aluminium shop sign. Colour TBC
S2	Large scale painted sign on brickwork
MISCELLANEOUS	
M1	Bat Box

Title	Predicted night-time facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	Predicted night-time facade noise levels L_{Aeq} (dB) 54-56 51-53 47-49
SANDY BROWN <i>Consultants in Acoustics, Noise & Vibration</i>	





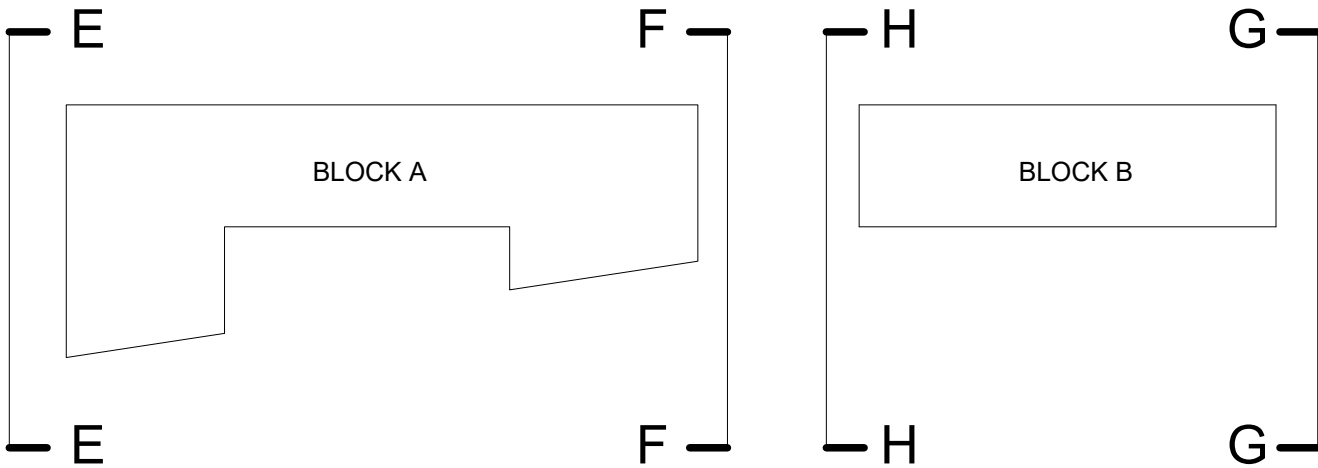
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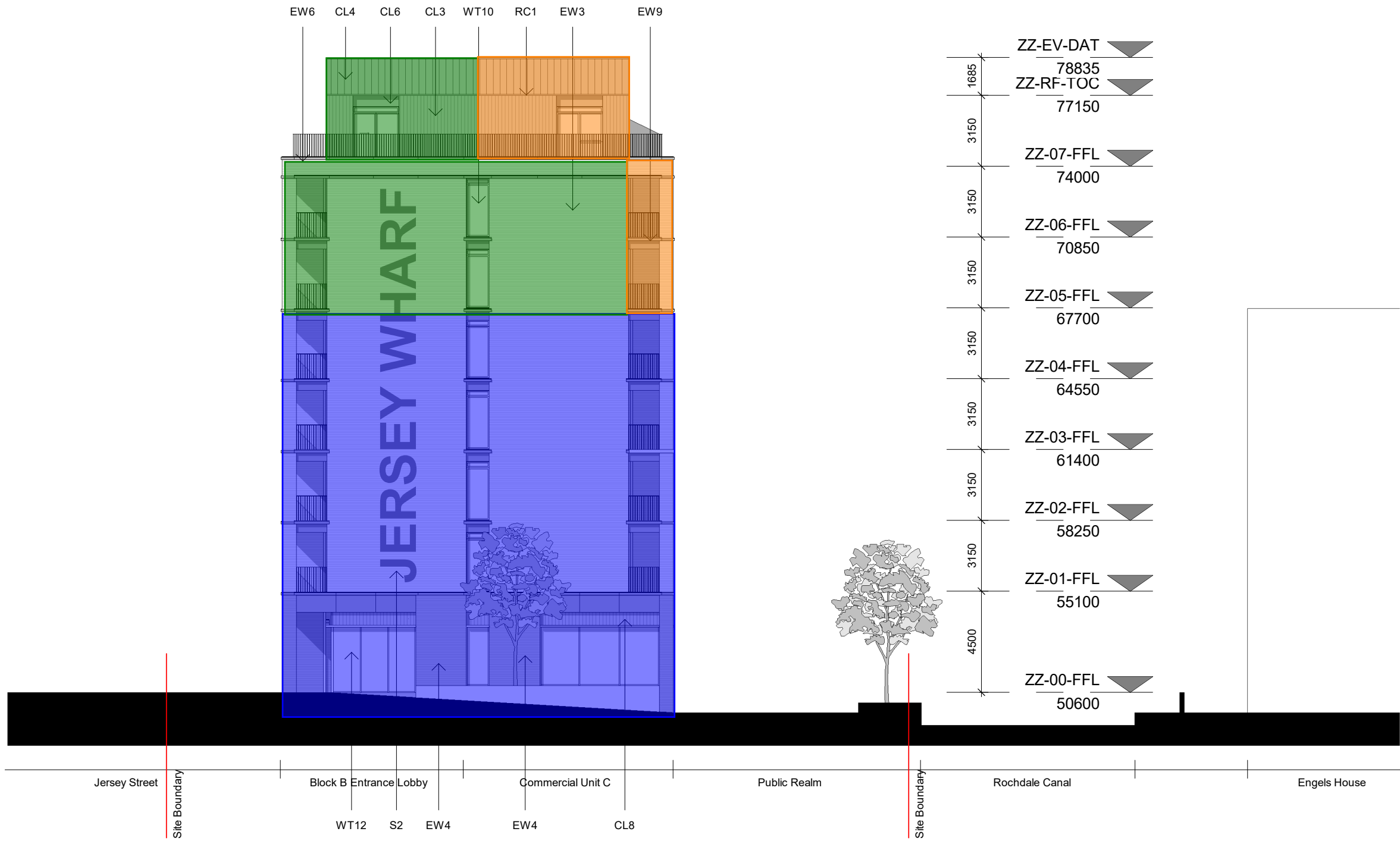


Elevation FF_Planning
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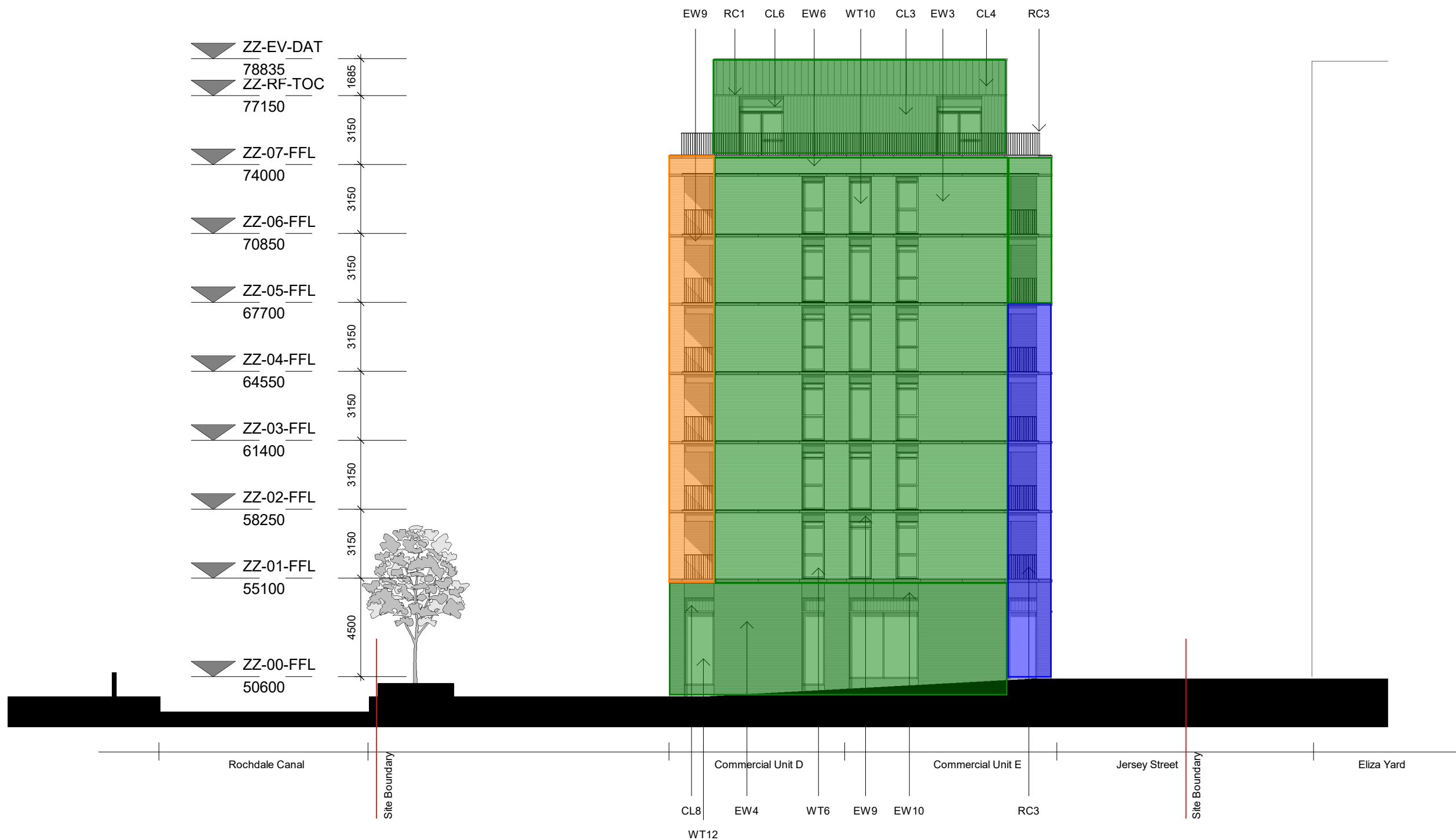
MASONRY	
EW1	Light terracotta brick, stretcher bond, light coloured mortar.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick. Fluted concrete form-work to face.
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.
CLADDING	
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour
CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour
WINDOWS AND DOORS	
WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT13	PPC louvred aluminium door. Frame colour to match WT1
WT14	Aluminium door with inset cladding panel to match CL9.
WT15	Aluminium door with inset cladding panel to match CL10.
WT16	Roller shutter door to vehicle garage. PPC to match windows frames.
RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	
RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding
RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour
RC3	PPC metal railing balustrade. Dark terracotta colour
RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour
RC5	PPC aluminium soffit panel. Dark terracotta colour
RC6	PPC aluminium rainwater pipe. Light terracotta colour
RC7	PPC aluminium rainwater pipe. Dark terracotta colour
RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding
RC9	Privacy screen
RC10	Louvred panel
SIGNAGE	
S1	PPC aluminium shop sign. Colour TBC
S2	Large scale painted sign on brickwork
MISCELLANEOUS	
M1	Bat Box

Title	Predicted night-time facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	68-71 57-67 L_{Afm} (dB) not normally exceeded at night time
SANDY BROWN Consultants in Acoustics, Noise & Vibration	





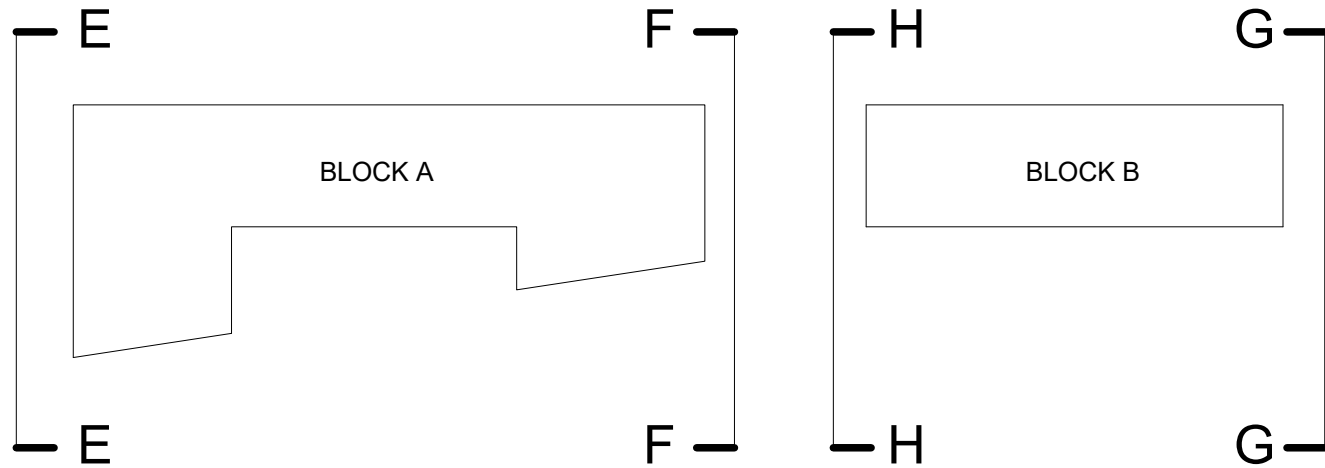
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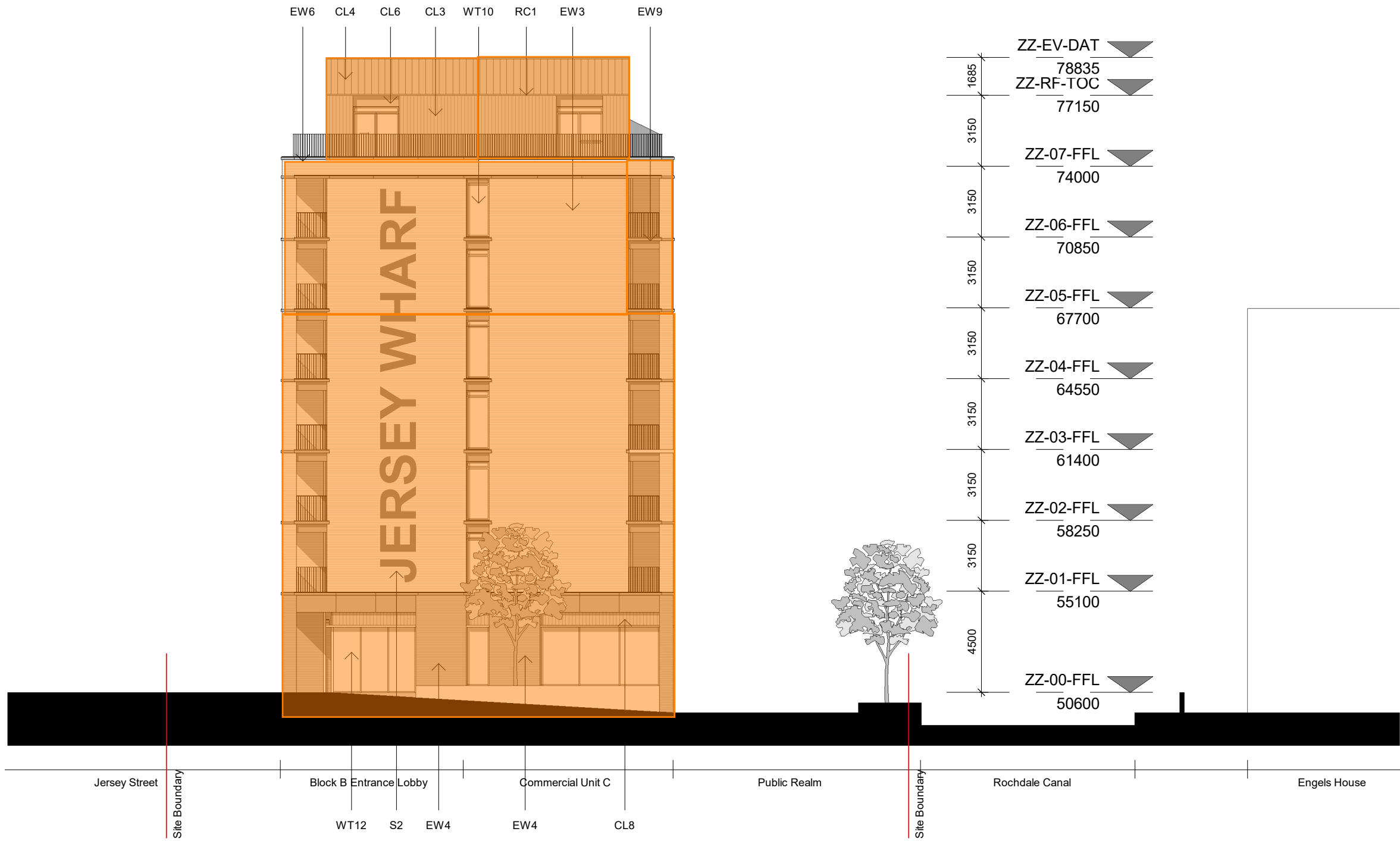


Elevation GG_Planning
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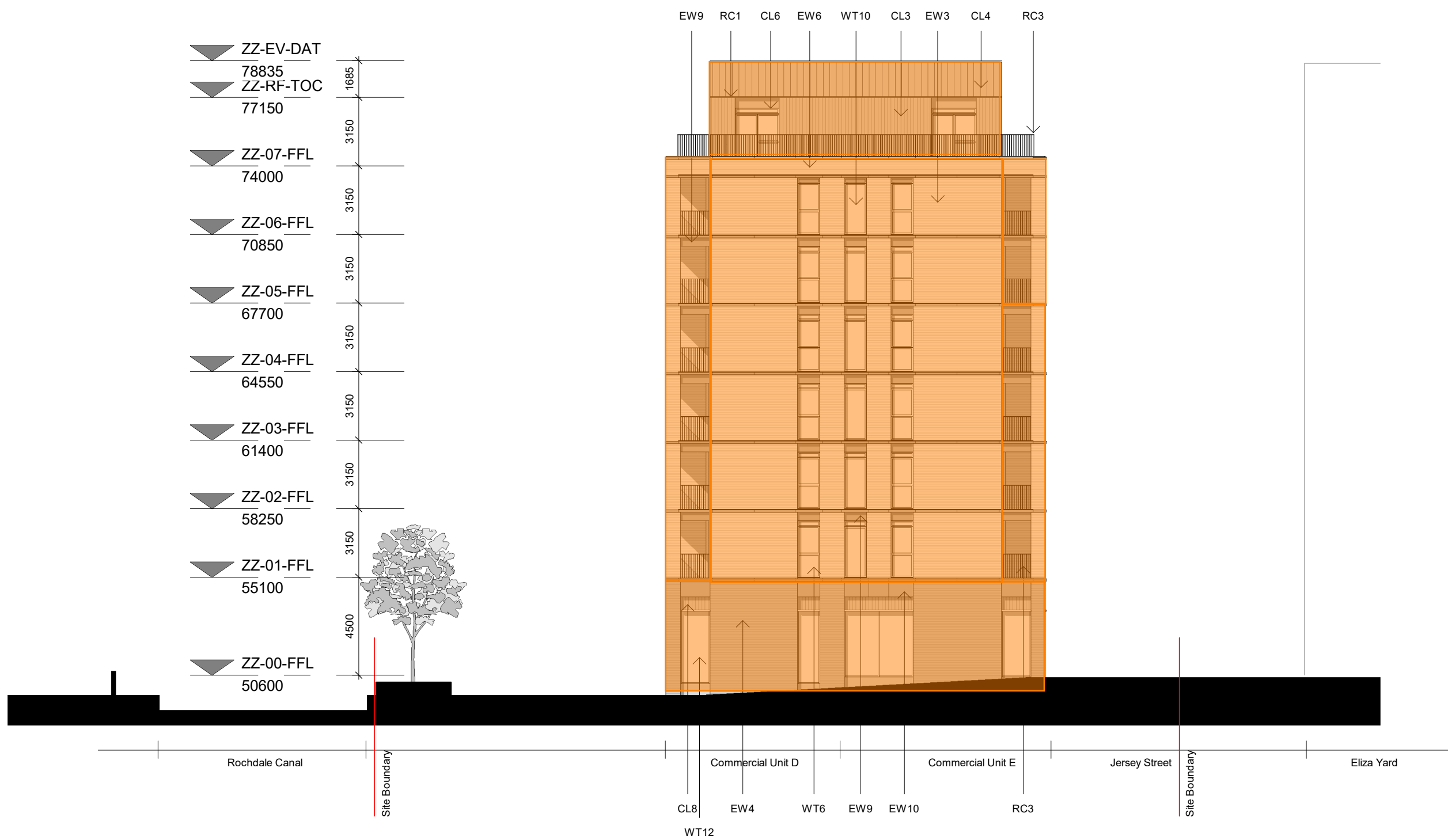
MASONRY	
EW1	Light terracotta brick, stretcher bond, light coloured mortar.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.
CLADDING	
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour
CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour
WINDOWS AND DOORS	
WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT13	PPC loured aluminium door. Frame colour to match WT1
WT14	Aluminium door with inset cladding panel to match CL9.
WT15	Aluminium door with inset cladding panel to match CL10.
WT16	Roller shutter door to vehicle garage. PPC to match windows frames.
RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	
RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding
RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour
RC3	PPC metal railing balustrade. Dark terracotta colour
RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour
RC5	PPC aluminium soffit panel. Dark terracotta colour
RC6	PPC aluminium rainwater pipe. Light terracotta colour
RC7	PPC aluminium rainwater pipe. Dark terracotta colour
RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding
RC9	Privacy screen
RC10	Loured panel
SIGNAGE	
S1	PPC aluminium shop sign. Colour TBC
S2	Large scale painted sign on brickwork
MISCELLANEOUS	
M1	Bat Box

Title	Predicted daytime facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	54-56 51-53 47-49 Predicted daytime facade noise levels L_{Aeq} (dB)
SANDY BROWN <i>Consultants in Acoustics, Noise & Vibration</i>	





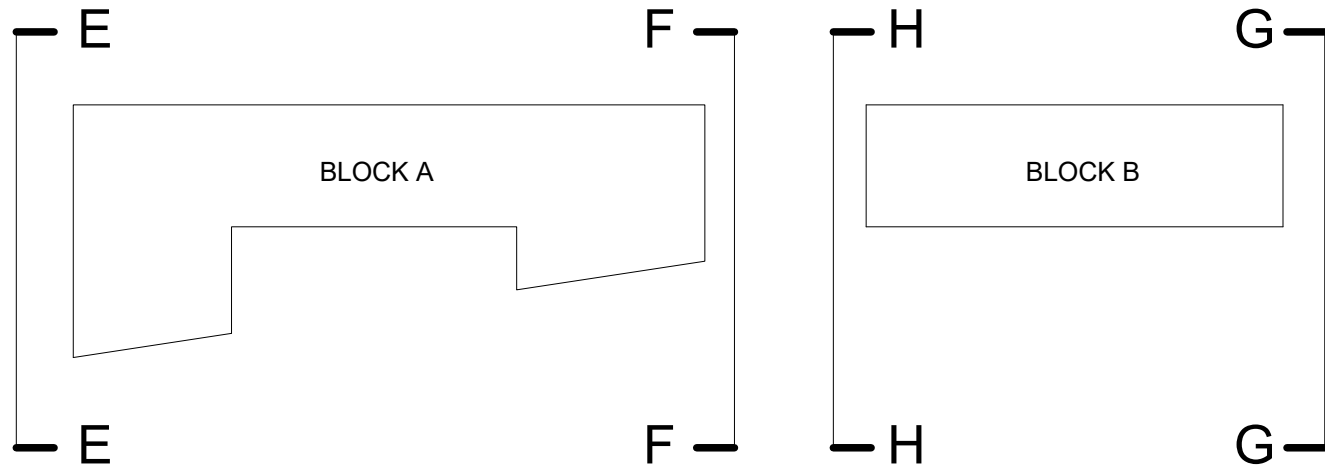
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Elevation GG_Planning
1 : 200

MASONRY	
EW1	Light terracotta brick, stretcher bond, light coloured mortar.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.
CLADDING	
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour
CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour
WINDOWS AND DOORS	
WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT4	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT11	Aluminium curtain walling. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT13	PPC loured aluminium door. Frame colour to match WT1
WT14	Aluminium door with inset cladding panel to match CL9.
WT15	Aluminium door with inset cladding panel to match CL10.
WT16	Roller shutter door to vehicle garage. PPC to match windows frames.
RAILINGS, COPINGS, SOFFITS AND RAINWATER PIPES	
RC1	PPC aluminium coping / flashing. Colour to match surrounding aluminium cladding
RC2	PPC metal railing balustrade. PPC paint finish - Light terracotta colour
RC3	PPC metal railing balustrade. Dark terracotta colour
RC4	PPC aluminium soffit panel. PPC paint finish - Light terracotta colour
RC5	PPC aluminium soffit panel. Dark terracotta colour
RC6	PPC aluminium rainwater pipe. Light terracotta colour
RC7	PPC aluminium rainwater pipe. Dark terracotta colour
RC8	PPC canopy / flashing to support signage. Colour to match aluminium cladding
RC9	Privacy screen
RC10	Loured panel
SIGNAGE	
S1	PPC aluminium shop sign. Colour TBC
S2	Large scale painted sign on brickwork
MISCELLANEOUS	
M1	Bat Box

Title	Predicted night-time facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	Predicted night-time facade noise levels L_{Aeq} (dB) 54-56 51-53 47-49
SANDY BROWN Consultants in Acoustics, Noise & Vibration	





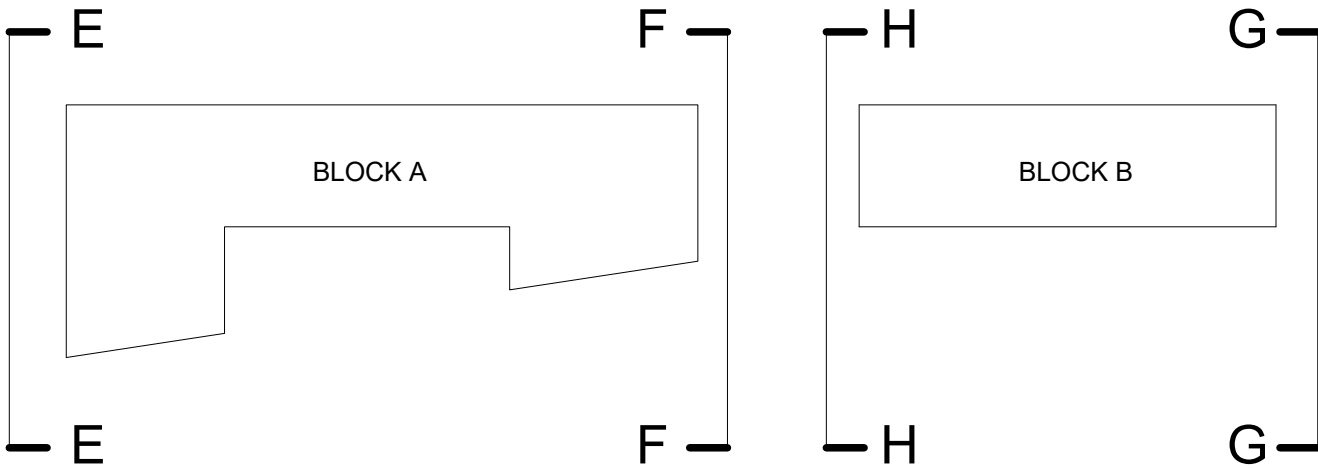
Elevation HH_Planning
1 : 200



Elevation GG_Planning
1 : 200

Title	Predicted night-time facade noise levels
Project	Jersey Wharf, Ancoats, Manchester
Project no.	21044
Version	E
Marked-up by	Jules Cochard
Reviewed by	James Atha
Date	4 May 2022
Mark-up key	$L_{A\text{Fmax}}$ (dB) not normally exceeded at night time 68-71 57-67
SANDY BROWN Consultants in Acoustics, Noise & Vibration	

MASONRY	
EW1	Light terracotta brick, stretcher bond, light coloured mortar.
EW2	Light terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW3	Dark terracotta brick, stretcher bond, red coloured mortar.
EW4	Dark terracotta brick, stretcher bond, dark coloured mortar. Every other course projects by 15mm.
EW5	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW1 brick.
EW6	Pigmented wet cast concrete string course with acid etch finish to expose concrete aggregate. 2 brick courses high with 50mm projection. Colour of concrete to match EW3 brick.
EW7	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick.
EW8	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW1 brick. Fluted concrete form-work to face.
EW9	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick.
EW10	Pigmented wet cast concrete panel and sill, acid etch finish to expose concrete aggregate. Colour of concrete to match EW3 brick. Fluted concrete form-work to face.
CLADDING	
CL1	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL2	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Light terracotta colour
CL3	Sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL4	Sinusoidal aluminium cladding, wide width wave length. PPC paint finish - Dark terracotta colour
CL5	Aluminium cladding spandrel panel, PPC paint finish - Light terracotta colour
CL6	Aluminium cladding spandrel panel, PPC paint finish - Dark terracotta colour
CL7	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Light terracotta colour
CL8	Perforated sinusoidal aluminium cladding, narrow width wave length. PPC paint finish - Dark terracotta colour
CL9	Patterned, perforated aluminium cladding. PPC paint finish - Light terracotta colour
CL10	Patterned, perforated aluminium cladding. PPC paint finish - Dark terracotta colour
WINDOWS AND DOORS	
WT1	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT2	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT3	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL1. Window reveal is 185mm from external face of brickwork.
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WT5	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL1. Window reveal is 185mm from external face of brickwork.
WT6	Aluminium window with fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT7	Aluminium window. Sash 1 is fixed lower pain and top hung, outward opening upper pane. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT8	Aluminium window with Juliette balcony. Sash 1 is inward opening casement window with PPC railing balustrade. Sash 2 is fixed pane. Integrated MVHR louvers to head of window. Frame and railing colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT9	Aluminium window. Sash 1 is inward opening casement window. Sash 2 is fixed pane. Sash 3 is fixed lower pain and top hung, outward opening upper pane. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
WT10	Aluminium AOV window. Outward opening casement window with smoke actuator. Integrated MVHR louvers to head of window. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
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WT12	Aluminium curtain walling. Frame colour to match CL3. Window reveal is 185mm from external face of brickwork.
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RC6	PPC aluminium rainwater pipe. Light terracotta colour
RC7	PPC aluminium rainwater pipe. Dark terracotta colour
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RC9	Privacy screen
RC10	Loured panel
SIGNAGE	
S1	PPC aluminium shop sign. Colour TBC
S2	Large scale painted sign on brickwork
MISCELLANEOUS	
M1	Bat Box



Appendix E

TM59 assessment from Buro Happold

Design Note

Project Back of Ancoats – Plot C (Jersey Wharf)
Subject Overheating and Performance Review
Project no 0048355
Date 1 December 2021

Revision	Description	Issued by	Date	Approved (signature)
00	Issued for information	LJ/JW	01/12/21	MR

1 Executive Summary

An overheating analysis has been carried out using IES Virtual Environments (VE) for the residential spaces at Back of Ancoats – Plot C (Jersey Wharf), in accordance with methodology defined in CIBSE TM59. The overheating assessment was carried out for the following scenario

- Natural ventilation provided via openable windows and standard mechanical ventilation (MVHR) provided for background ventilation throughout a day.

The results for this scenario are included within section 5 of this report, identifying that this scenario can meet the TM59 criteria and therefore overheating risk is at a minimum. The following is a summary of the design measures that help mitigate the overheating risks:

- Window openings, designed to meet Part F purge ventilation. Attention has been made to ensure effective opening areas to be achieved;
- Mechanical ventilation based on MVHR to provide background ventilation;
- Window /glazing size has been discussed extensively during the design stage, driven by minimising heat loss to meet the future building regulation Part L, i.e. 31% improvement over above the current building regulation standard.
- Solar gain reduction by using windows with low g value, whilst still maintaining light transmittance of no less than 60% and allowing homes to benefit from the winter solar gains to reduce energy cost.

2 Introduction

In order to future-proof the development against the risks of increased temperatures due to climate change, thermal comfort assessments have been undertaken for the residential spaces of the Jersey Wharf development.

The residential spaces do not have mechanical cooling proposed and so were assessed against the CIBSE TM59 adaptive thermal comfort criteria, which allows for tolerance of occupants in naturally ventilated environments.

3 Methodology

The overheating assessment for this project has been based on CIBSE Technical Memorandum 59 (TM59) Design methodology for the assessment of overheating risk in homes. TM59 provides separate compliance criteria for dwellings, This report has been prepared for the sole benefit, use and information of [Client] for the purposes set out in the Design note or instructions commissioning it. The liability of Buro Happold in respect of the information contained in the report will not extend to any third party. All concepts and proposals are copyright © 1976 – 2021 Buro Happold. All rights reserved. Issued in commercial confidence.

while it also refers to TM52 for adaptive thermal comfort. TM59 differs to TM52 in that only 2 criteria are assessed, however both must be adhered to. Additionally, the criterion set out in TM59 are specific to residential areas. TM52 and TM59 share the same first criterion.

The second TM59 criterion varies depending on the predominant method of ventilation; the criterion for natural ventilation was used in this case.

TM59 Criteria:

1. For living rooms, kitchens and bedrooms: the number of hours during which ΔT is greater than or equal to 1°C during the period May to September inclusive shall not be more than 3 per cent of occupied hours.
 - $\Delta T = T_{\text{op}} - T_{\text{max}}$, where:
 - T_{op} – actual operative room temperature
 - T_{max} – the limiting maximum acceptable temperature (func. of outdoor temp)
2. For bedrooms only: to guarantee comfort during the sleeping hours the operative temperature in the bedroom from 10 pm to 7 am shall not exceed 26°C for more than 1% of annual hours (>32 hours per year).

Dynamic thermal simulation has been carried out and results shown in the following sections are reported against TM59 criteria.

4 Modelling Inputs & Assumptions

4.1 Building geometry and fabric

Building heights and internal layouts were taken from the latest architectural information received on 24/11/21. A selection of apartments at highest risk of overheating due to their orientation and geometry were modelled; these include apartments on higher floors, with large areas of south-facing glazing, and inline apartments with only one external wall. Table 4-1 highlights the fabric assumptions for the site.

Table 4.1 – Building fabric assumptions

Element	Parameter	Value
External wall	U value	$0.14 \text{ W/m}^2\text{K}$
Roof	U value	$0.1 \text{ W/m}^2\text{K}$
External glazing	U value	$0.8 \text{ W/m}^2\text{K}$ (triple glazed)
	g value	0.48

There are existing tall buildings adjacent to the site which will affect solar gain, and therefore risk of overheating, within the Jersey Wharf buildings. These have therefore been added into the model.

4.2 Internal Gains

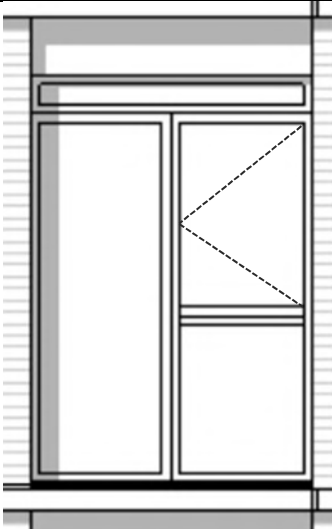
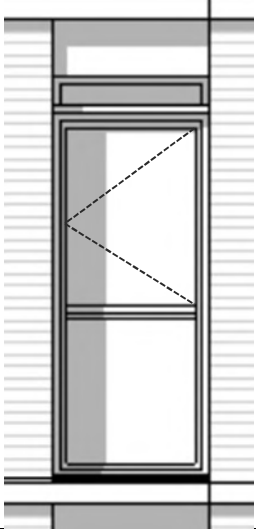
The internal gain levels and profiles were taken directly from the IES VE TM59 Template and can be found in Appendix 1.

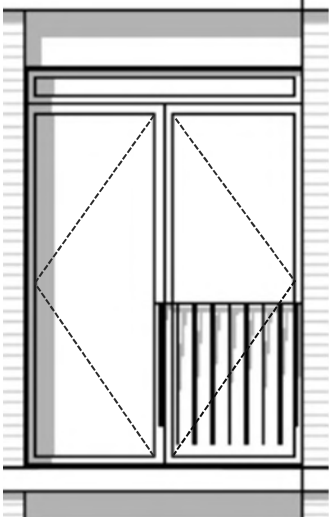
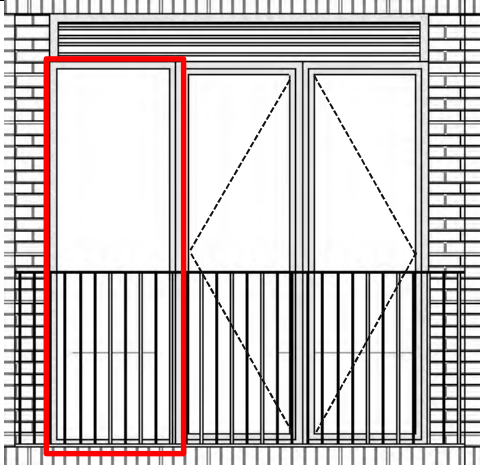
4.3 Window Openings

Four types of windows have been modelled based upon the apartments selected; their parameters are shown in the table below. If an open window is to be used as a means of mitigating overheating, it must have a minimum free area that satisfies the purge ventilation criteria set out in Approved Document Part F (Appendix B: Purge ventilation) of the

Building Regulations for England (NBS, 2010). For a hinged or pivot window that opens 30° or more, this free area should be at least 1/20th of the floor area of the room. For a hinged or pivot window that opens between 15° and 30°, this should be at least 1/10th of the floor area of the room. These criteria were adhered to whilst modelling.

Table 4.2

Window Name	Example of window type	Length/Height ratio of opening	Hanging Type	Openable Area	Max angle open	Equivalent orifice area
Bedroom window 1		0.76	Side-hung	90%	90°	94.4% of gross
Bedroom window 2		0.76	Side-hung	90%	90°	94.4% of gross

Balcony door		0.38	Side-hung	90%	90°	92.9% of gross
Fixed door		0.38	-	0%	0°	-

In Scenario 1, the window opening modulating profile is such that the window is modelled as open if the internal temperature exceeds 22°C, as per CIBSE TM59 guidelines.

4.4 Shading

In some cases, external shading was provided from balconies, which are vertically stacked. Shading was also provided from other tall structures near the site.

4.5 Weather

In accordance with CIBSE TM59, the DSY1 weather file for Manchester location was used, specific to the 2020s with high emissions (50th percentile scenario). For context, TM49 demonstrates the probability of a summer being as warm as or warmer than DSY1 is 1 in 9, for DSY2 this decreases to 1 in 19 and 1 in 27 for DSY 2 and 3 respectively (based on weighted cooling degree hours metric). Passing DSY1 for the 2020s, high emissions, 50% percentile scenario is mandatory for TM59 compliance and for this reason is the only weather file that has been modelled.

4.6 Cooling

No cooling system has been proposed for the residential spaces.

5 Results

The below table summarises the results of the overheating assessment.

Table 5.1 TM59 Criteria 1 and 2 results for all rooms, with openable windows and no mechanical ventilation

Room Name	TM59 Criteria 1 (living, kitchen and bedrooms)		TM59 Criteria 2 (bedrooms only)	
	%Hrs Top-Tmax>=1K	Pass?	%Hrs Top>26C between 10pm-7am	Pass?
BK1 1F 1B2P 4 BEDROOM	0	Pass	2	Pass
BK1 1F 1B2P 4 LIVING	0.1	Pass	n/a	N/A
BK1 1F 2B4P 1 BEDROOM 1	0.3	Pass	3	Pass
BK1 1F 2B4P 1 BEDROOM 2	0.9	Pass	6	Pass
BK1 1F 2B4P 1 LIVING	0.7	Pass	n/a	N/A
BK1 1F 2B4P 12 BEDROOM 1	0.4	Pass	3	Pass
BK1 1F 2B4P 12 BEDROOM 2	0.8	Pass	4	Pass
BK1 1F 2B4P 12 LIVING	0.5	Pass	n/a	N/A
BK1 1F 2B4P 17 BEDROOM 1	0.7	Pass	5	Pass
BK1 1F 2B4P 17 BEDROOM 2	0.6	Pass	4	Pass
BK1 1F 2B4P 17 LIVING	0.6	Pass	n/a	N/A
BK1 1F 3B6P 16 BEDROOM 1	0.8	Pass	6	Pass
BK1 1F 3B6P 16 BEDROOM 2	1.1	Pass	6	Pass
BK1 1F 3B6P 16 BEDROOM 3	1	Pass	6	Pass
BK1 1F 3B6P 16 LIVING	0.5	Pass	n/a	N/A
BK1 2F 1B2P 4 BEDROOM	0	Pass	3	Pass
BK1 2F 1B2P 4 LIVING	0.1	Pass	n/a	N/A
BK1 2F 2B4P 1 BEDROOM 1	0.3	Pass	3	Pass
BK1 2F 2B4P 1 BEDROOM 2	1	Pass	7	Pass
BK1 2F 2B4P 1 LIVING	0.7	Pass	n/a	N/A
BK1 2F 2B4P 12 BEDROOM 1	0.6	Pass	3	Pass
BK1 2F 2B4P 12 BEDROOM 2	0.8	Pass	4	Pass
BK1 2F 2B4P 12 LIVING	0.5	Pass	n/a	N/A
BK1 2F 2B4P 17 BEDROOM 1	0.8	Pass	6	Pass
BK1 2F 2B4P 17 BEDROOM 2	0.6	Pass	4	Pass
BK1 2F 2B4P 17 LIVING	0.8	Pass	n/a	N/A

BK1 2F 3B6P 16 BEDROOM 1	0.9	Pass	6	Pass
BK1 2F 3B6P 16 BEDROOM 2	1.3	Pass	6	Pass
BK1 2F 3B6P 16 BEDROOM 3	1.1	Pass	6	Pass
BK1 2F 3B6P 16 LIVING	0.5	Pass	n/a	N/A
BK1 3F 1B2P 4 BEDROOM	0	Pass	3	Pass
BK1 3F 1B2P 4 LIVING	0.1	Pass	n/a	N/A
BK1 3F 2B4P 1 BEDROOM 1	0.4	Pass	3	Pass
BK1 3F 2B4P 1 BEDROOM 2	1	Pass	7	Pass
BK1 3F 2B4P 1 LIVING	0.8	Pass	n/a	N/A
BK1 3F 2B4P 12 BEDROOM 1	0.6	Pass	3	Pass
BK1 3F 2B4P 12 BEDROOM 2	0.8	Pass	4	Pass
BK1 3F 2B4P 12 LIVING	0.5	Pass	n/a	N/A
BK1 3F 2B4P 17 BEDROOM 1	0.8	Pass	6	Pass
BK1 3F 2B4P 17 BEDROOM 2	0.6	Pass	4	Pass
BK1 3F 2B4P 17 LIVING	0.8	Pass	n/a	N/A
BK1 3F 3B6P 16 BEDROOM 1	1	Pass	6	Pass
BK1 3F 3B6P 16 BEDROOM 2	1.3	Pass	6	Pass
BK1 3F 3B6P 16 BEDROOM 3	1.1	Pass	6	Pass
BK1 3F 3B6P 16 LIVING	0.5	Pass	n/a	N/A
BK1 4F 1B2P 4 BEDROOM	0.1	Pass	3	Pass
BK1 4F 1B2P 4 LIVING	0.1	Pass	n/a	N/A
BK1 4F 2B4P 1 BEDROOM 1	0.4	Pass	3	Pass
BK1 4F 2B4P 1 BEDROOM 2	0.9	Pass	6	Pass
BK1 4F 2B4P 1 LIVING	0.8	Pass	n/a	N/A
BK1 4F 2B4P 12 BEDROOM 1	0.6	Pass	3	Pass
BK1 4F 2B4P 12 BEDROOM 2	0.8	Pass	4	Pass
BK1 4F 2B4P 12 LIVING	0.6	Pass	n/a	N/A
BK1 4F 2B4P 17 BEDROOM 1	0.8	Pass	5	Pass
BK1 4F 2B4P 17 BEDROOM 2	0.6	Pass	4	Pass
BK1 4F 2B4P 17 LIVING	0.8	Pass	n/a	N/A
BK1 4F 3B6P 16 BEDROOM 1	1	Pass	6	Pass
BK1 4F 3B6P 16 BEDROOM 2	1.3	Pass	6	Pass

BK1 4F 3B6P 16 BEDROOM 3	1.1	Pass	5	Pass
BK1 4F 3B6P 16 LIVING	0.5	Pass	n/a	N/A
BK1 5F 1B2P 4 BEDROOM	0.1	Pass	3	Pass
BK1 5F 1B2P 4 LIVING	0.3	Pass	n/a	N/A
BK1 5F 2B4P 1 BEDROOM 1	0.4	Pass	3	Pass
BK1 5F 2B4P 1 BEDROOM 2	1	Pass	6	Pass
BK1 5F 2B4P 1 LIVING	0.8	Pass	n/a	N/A
BK1 5F 2B4P 12 BEDROOM 1	0.6	Pass	3	Pass
BK1 5F 2B4P 12 BEDROOM 2	0.8	Pass	3	Pass
BK1 5F 2B4P 12 LIVING	0.6	Pass	n/a	N/A
BK1 5F 2B4P 17 BEDROOM 1	0.8	Pass	5	Pass
BK1 5F 2B4P 17 BEDROOM 2	0.6	Pass	4	Pass
BK1 5F 2B4P 17 LIVING	0.8	Pass	n/a	N/A
BK1 5F 3B6P 16 BEDROOM 1	1	Pass	5	Pass
BK1 5F 3B6P 16 BEDROOM 2	1.3	Pass	5	Pass
BK1 5F 3B6P 16 BEDROOM 3	1.1	Pass	5	Pass
BK1 5F 3B6P 16 LIVING	0.5	Pass	n/a	N/A
BK1 6F 1B2P 4 BEDROOM	0.2	Pass	2	Pass
BK1 6F 1B2P 4 LIVING	0.3	Pass	n/a	N/A
BK1 6F 2B4P 1 BEDROOM 1	0.3	Pass	3	Pass
BK1 6F 2B4P 1 BEDROOM 2	0.7	Pass	4	Pass
BK1 6F 2B4P 1 LIVING	0.6	Pass	n/a	N/A
BK1 6F 2B4P 12 BEDROOM 1	0.3	Pass	3	Pass
BK1 6F 2B4P 12 BEDROOM 2	0.7	Pass	3	Pass
BK1 6F 2B4P 12 LIVING	0.4	Pass	n/a	N/A
BK1 6F 2B4P 17 BEDROOM 1	0.7	Pass	4	Pass
BK1 6F 2B4P 17 BEDROOM 2	0.4	Pass	4	Pass
BK1 6F 2B4P 17 LIVING	0.7	Pass	n/a	N/A
BK1 6F 3B6P 16 BEDROOM 1	0.8	Pass	4	Pass
BK1 6F 3B6P 16 BEDROOM 2	1.1	Pass	4	Pass
BK1 6F 3B6P 16 BEDROOM 3	0.8	Pass	4	Pass
BK1 6F 3B6P 16 LIVING	0.3	Pass	n/a	N/A

BK1 7F 3B6P 1 BEDROOM 1	1.7	Pass	4	Pass
BK1 7F 3B6P 1 BEDROOM 2	2.3	Pass	4	Pass
BK1 7F 3B6P 1 BEDROOM 3	2.2	Pass	4	Pass
BK1 7F 3B6P 1 LIVING	1.1	Pass	n/a	N/A
BK1 7F 3B6P 10 BEDROOM 1	1.5	Pass	4	Pass
BK1 7F 3B6P 10 BEDROOM 2	1.9	Pass	4	Pass
BK1 7F 3B6P 10 BEDROOM 3	1.9	Pass	4	Pass
BK1 7F 3B6P 10 LIVING	0.2	Pass	n/a	N/A
BK2 1F 1B2P 9 BEDROOM	0.3	Pass	3	Pass
BK2 1F 1B2P 9 LIVING	0.3	Pass	n/a	N/A
BK2 1F 2B4P 1 BEDROOM 1	0.3	Pass	3	Pass
BK2 1F 2B4P 1 BEDROOM 2	0.8	Pass	5	Pass
BK2 1F 2B4P 1 LIVING	0.4	Pass	n/a	N/A
BK2 1F 2B4P 11 BEDROOM 1	0.7	Pass	4	Pass
BK2 1F 2B4P 11 BEDROOM 2	1.1	Pass	6	Pass
BK2 1F 2B4P 11 LIVING	0.6	Pass	n/a	N/A
BK2 1F 2B4P 7 BEDROOM 1	0.6	Pass	3	Pass
BK2 1F 2B4P 7 BEDROOM 2	0.8	Pass	4	Pass
BK2 1F 2B4P 7 LIVING	0.6	Pass	n/a	N/A
BK2 2F 1B2P 9 BEDROOM	0.3	Pass	3	Pass
BK2 2F 1B2P 9 LIVING	0.4	Pass	n/a	N/A
BK2 2F 2B4P 1 BEDROOM 1	0.5	Pass	4	Pass
BK2 2F 2B4P 1 BEDROOM 2	0.9	Pass	7	Pass
BK2 2F 2B4P 1 LIVING	0.5	Pass	n/a	N/A
BK2 2F 2B4P 11 BEDROOM 1	0.7	Pass	4	Pass
BK2 2F 2B4P 11 BEDROOM 2	1.2	Pass	6	Pass
BK2 2F 2B4P 11 LIVING	0.6	Pass	n/a	N/A
BK2 2F 2B4P 7 BEDROOM 1	0.6	Pass	3	Pass
BK2 2F 2B4P 7 BEDROOM 2	0.9	Pass	4	Pass
BK2 2F 2B4P 7 LIVING	0.7	Pass	n/a	N/A
BK2 3F 1B2P 9 BEDROOM	0.3	Pass	3	Pass
BK2 3F 1B2P 9 LIVING	0.4	Pass	n/a	N/A

BK2 3F 2B4P 1 BEDROOM 1	0.7	Pass	4	Pass
BK2 3F 2B4P 1 BEDROOM 2	1	Pass	7	Pass
BK2 3F 2B4P 1 LIVING	0.5	Pass	n/a	N/A
BK2 3F 2B4P 11 BEDROOM 1	0.7	Pass	4	Pass
BK2 3F 2B4P 11 BEDROOM 2	1.2	Pass	6	Pass
BK2 3F 2B4P 11 LIVING	0.6	Pass	n/a	N/A
BK2 3F 2B4P 7 BEDROOM 1	0.6	Pass	3	Pass
BK2 3F 2B4P 7 BEDROOM 2	0.9	Pass	4	Pass
BK2 3F 2B4P 7 LIVING	0.7	Pass	n/a	N/A
BK2 4F 1B2P 9 BEDROOM	0.3	Pass	3	Pass
BK2 4F 1B2P 9 LIVING	0.4	Pass	n/a	N/A
BK2 4F 2B4P 1 BEDROOM 1	0.8	Pass	4	Pass
BK2 4F 2B4P 1 BEDROOM 2	1.2	Pass	7	Pass
BK2 4F 2B4P 1 LIVING	0.6	Pass	n/a	N/A
BK2 4F 2B4P 11 BEDROOM 1	0.7	Pass	4	Pass
BK2 4F 2B4P 11 BEDROOM 2	1.1	Pass	6	Pass
BK2 4F 2B4P 11 LIVING	0.6	Pass	n/a	N/A
BK2 4F 2B4P 7 BEDROOM 1	0.6	Pass	3	Pass
BK2 4F 2B4P 7 BEDROOM 2	0.9	Pass	4	Pass
BK2 4F 2B4P 7 LIVING	0.7	Pass	n/a	N/A
BK2 5F 1B2P 9 BEDROOM	0.3	Pass	3	Pass
BK2 5F 1B2P 9 LIVING	0.4	Pass	n/a	N/A
BK2 5F 2B4P 1 BEDROOM 1	0.8	Pass	4	Pass
BK2 5F 2B4P 1 BEDROOM 2	1.3	Pass	8	Pass
BK2 5F 2B4P 1 LIVING	0.8	Pass	n/a	N/A
BK2 5F 2B4P 11 BEDROOM 1	0.7	Pass	3	Pass
BK2 5F 2B4P 11 BEDROOM 2	1.1	Pass	4	Pass
BK2 5F 2B4P 11 LIVING	0.6	Pass	n/a	N/A
BK2 5F 2B4P 7 BEDROOM 1	0.6	Pass	3	Pass
BK2 5F 2B4P 7 BEDROOM 2	0.8	Pass	4	Pass
BK2 5F 2B4P 7 LIVING	0.6	Pass	n/a	N/A
BK2 6F 1B2P 9 BEDROOM	0.1	Pass	3	Pass

BK2 6F 1B2P 9 LIVING	0.2	Pass	n/a	N/A
BK2 6F 2B4P 1 BEDROOM 1	0.7	Pass	3	Pass
BK2 6F 2B4P 1 BEDROOM 2	1	Pass	4	Pass
BK2 6F 2B4P 1 LIVING	0.7	Pass	n/a	N/A
BK2 6F 2B4P 11 BEDROOM 1	0.3	Pass	3	Pass
BK2 6F 2B4P 11 BEDROOM 2	0.9	Pass	4	Pass
BK2 6F 2B4P 11 LIVING	0.3	Pass	n/a	N/A
BK2 6F 2B4P 7 BEDROOM 1	0.3	Pass	3	Pass
BK2 6F 2B4P 7 BEDROOM 2	0.7	Pass	3	Pass
BK2 6F 2B4P 7 LIVING	0.5	Pass	n/a	N/A
BK2 7F 2B6P 5 BEDROOM 2	0.1	Pass	3	Pass
BK2 7F 2B6P 5 LIVING	0.2	Pass	n/a	N/A

6 Conclusions of overheating assessment

The results show that, with the assumptions outlined in Section 4, overheating has been mitigated in all bedrooms and living rooms – fulfilling both TM59 criteria outlined in Section 3 through the use of natural ventilation via openable windows. The following is a summary of the design measures that help mitigate the overheating risks adopted by the proposed buildings:

- Window openings, designed to meet Part F purge ventilation. Attention has been made to ensure effective opening areas to be achieved;
- Mechanical ventilation based on MVHR to provide background ventilation;
- Window /glazing size has been discussed extensively during the design stage, driven by minimising heat loss to meet the future building regulation Part L, i.e. 31% improvement over above the current building regulation standard.
- Solar gain reduction by using windows with low g value, whilst still maintaining light transmittance of no less than 60% and allowing homes to benefit from the winter solar gains to reduce energy cost.

7 Appendices

7.1 Appendix 1: TM59 Internal Gains

Room type	Gain type	Peak value	Modulating profile
Double bedroom	People	2 people (75W sensible, 55W latent each)	08:00-09:00 fully occupied 09:00-22:00 50% occupied 22:00-23:00 fully occupied 23:00-08:00 70% of maximum (sleeping)
	Equipment	80W	09:00-23:00 maximum 23:00-09:00 13% of maximum
	Lighting	2W/m ²	18:00-23:00 on 23:00-18:00 off
Single bedroom	People	1 person (75W sensible, 55W latent)	08:00-23:00 occupied 23:00-08:00 70% of maximum (sleeping)
	Equipment	80W	09:00-23:00 maximum 23:00-09:00 13% of maximum
	Lighting	2W/m ²	18:00-23:00 on 23:00-18:00 off
Studio	People	2 people (75W sensible, 55W latent each)	00:00-24:00 fully occupied
	Equipment	450W	09:00-18:00 24% of maximum 18:00-20:00 maximum 20:00-22:00 44% of maximum 22:00-24:00 24% of maximum

			24:00-00:00 19% of maximum
	Lighting	2W/m ²	18:00-23:00 on 23:00-18:00 off
1 Double bedroom kitchen/living	People	2 person (75W sensible, 55W latent)	09:00-22:00 fully occupied 22:00-09:00 unoccupied
	Cooking/equipment	450W	09:00-18:00 24% of maximum 18:00-20:00 maximum 20:00-22:00 44% of maximum 22:00-24:00 24% of maximum 24:00-09:00 19% of maximum
	Lighting	2W/m ²	18:00-23:00 on 23:00-18:00 off
2 Double bedroom kitchen/living	People	4 person (75W sensible, 55W latent)	09:00-22:00 fully occupied 22:00-09:00 unoccupied
	Cooking/equipment	450W	09:00-18:00 24% of maximum 18:00-20:00 maximum 20:00-22:00 44% of maximum 22:00-24:00 24% of maximum 24:00-09:00 19% of maximum
	Lighting	2W/m ²	18:00-23:00 on 23:00-18:00 off
1 Double bedroom and 1 Single bedroom kitchen/living	People	3 person (75W sensible, 55W latent)	09:00-22:00 fully occupied 22:00-09:00 unoccupied
	Cooking/equipment	450W	09:00-18:00 24% of maximum 18:00-20:00 maximum 20:00-22:00 44% of maximum 22:00-24:00 24% of maximum 24:00-09:00 19% of maximum
	Lighting	2W/m ²	18:00-23:00 on 23:00-18:00 off
2 Double bedroom and 1 Single bedroom kitchen/living	People	5 person (75W sensible, 55W latent)	09:00-22:00 fully occupied 22:00-09:00 unoccupied
	Cooking/equipment	450W	09:00-18:00 24% of maximum 18:00-20:00 maximum 20:00-22:00 44% of maximum

			22:00-24:00 24% of maximum 24:00-09:00 19% of maximum
	Lighting	2W/m ²	18:00-23:00 on 23:00-18:00 off

Appendix F

Note regarding AVO assessment procedure

SANDY BROWN

Consultants in Acoustics, Noise & Vibration

**Planning Department
Manchester City Council**

21044-DL01-A

6 January 2022

Jersey Wharf, Manchester *Note regarding AVO assessment methodology*

To whom it may concern,

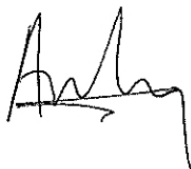
I write as one of the principal authors of the Acoustics, Ventilation and Overheating Residential Design Guide, (AVO Guide), January 2020.

The AVO Guide presents a method to assess the risk of adverse effects on residents arising from internal noise during overheating mitigation.

The AVO guide suggests the use of graphical representation to evaluate expected noise levels against Significant Observed Adverse Effect Levels (SOAELs). This allows internal ambient noise levels from transport sources to be plotted against the duration for which overheating conditions occur. The relevant duration period may depend on the local site conditions, facade orientation and building fabric design.

I have reviewed the assessment approach used for the Jersey Wharf development. This has been based on percentage time of opening windows between May and September. The daytime hours in this period have been used for the living rooms and night-time hours for bedrooms. I agree that this is a reasonable approach for this site. It is consistent with other assessments I have reviewed for new residential developments in London and Manchester.

Yours faithfully



Andrew Long
Associate Director

For and on behalf of
Sandy Brown Ltd

55 Charterhouse Street, London EC1M 6HA
Also in Manchester, Edinburgh, Birmingham, Belfast, Leeds

Sandy Brown Ltd
Registered in England & Wales No. 13227735

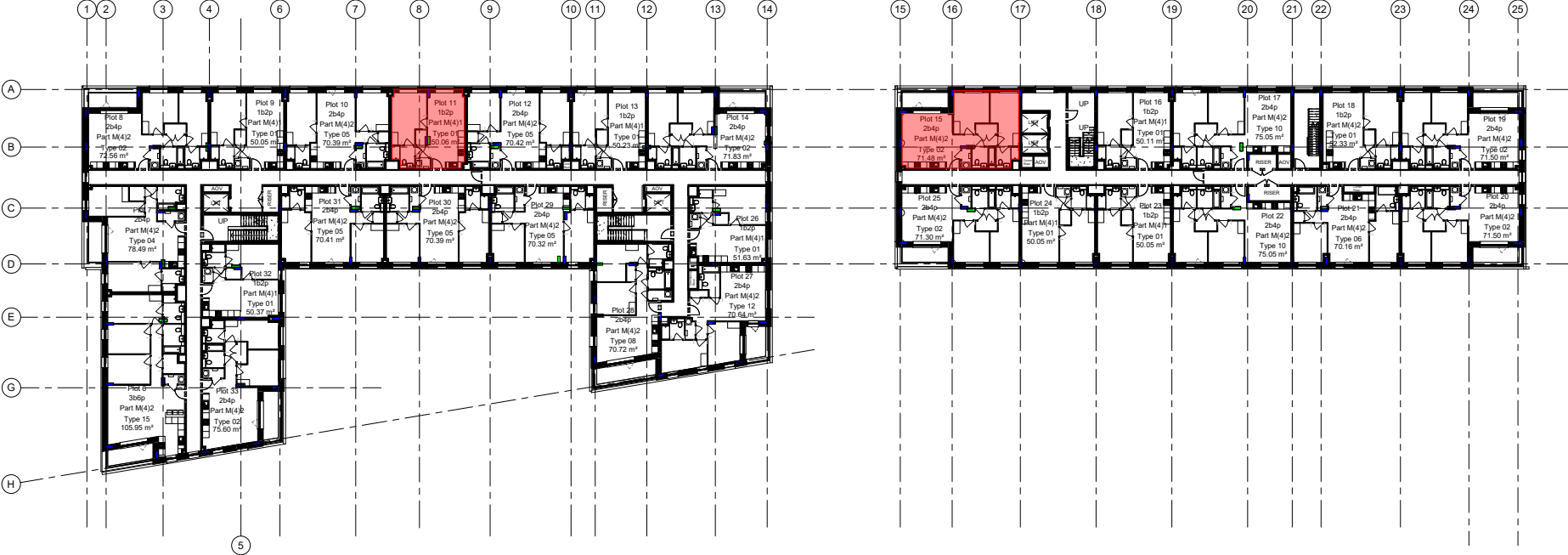
T: +44 (0)20 7549 3500
post@sandybrown.com
www.sandybrown.com

Registered Office: 55 Charterhouse Street, London EC1M 6HA

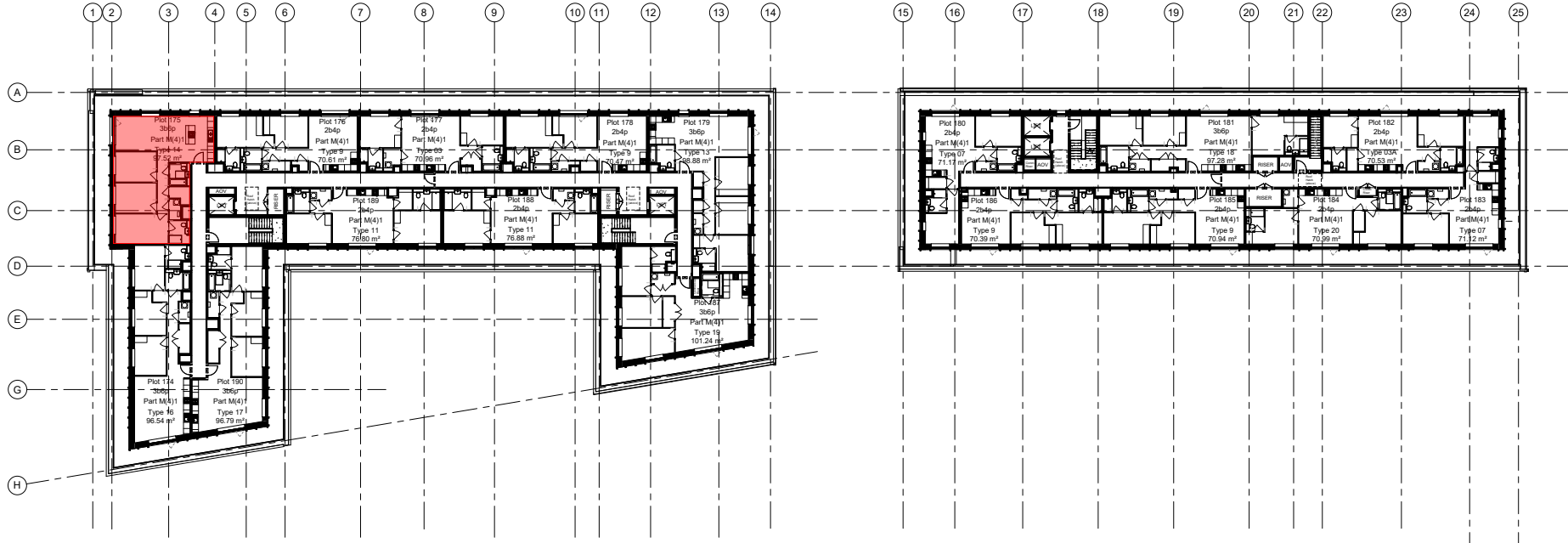
Appendix G

Internal noise levels during overheating condition

Jersey Wharf
Rooms Assessed for Overheating



Levels 1-6



Levels 7



Criteria Assessed

- Windows open at room operative temperature of 22°C (as per CIBSE TM59)
- Windows close at room operative temperature of 22°C
- Windows 'open' when equivalent area >0m²
- Period Assessed - May to September
- Daytime - 7am to 11pm
- Night time - 11pm to 7am

Noise Levels

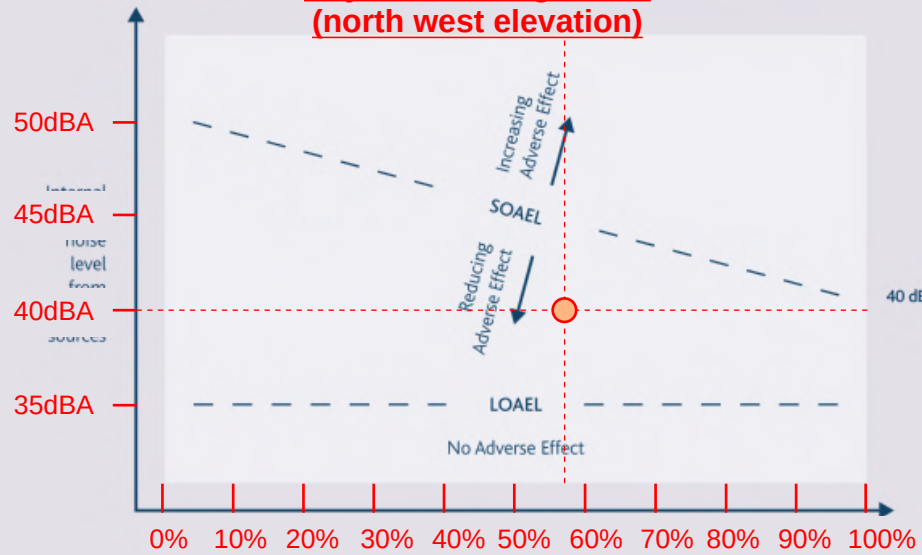
- Predicted internal noise levels on worst-case facade (Jersey St) provided by Sandy Brown on 12/11/21

Table 9 Predicted internal levels based on partially open window providing 13 dB of attenuation

Location	$L_{Aeq,16hrs}$ (dB) day (0700-2300)	$L_{Aeq,8hrs}$ (dB) night- time (2300-0700)	Not normally exceeded L_{AFmax} (dB)
Level 1	40	33	55
Level 2	39	31	52
Level 3	38	31	50
Level 4	38	31	48
Level 5	37	31	47
Level 6	37	31	46
Level 7	35	30	41

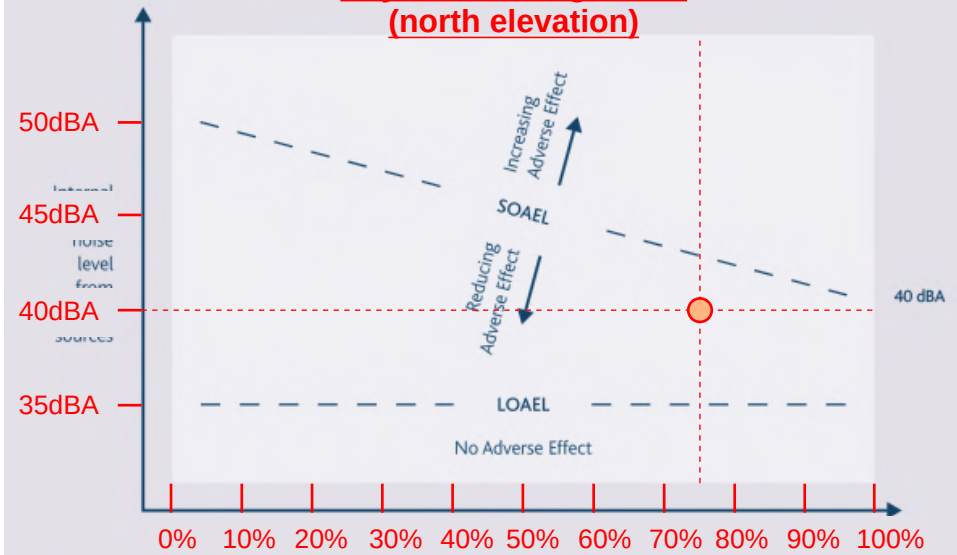
First Floor:
Block 1

Daytime - Living Room
(north west elevation)

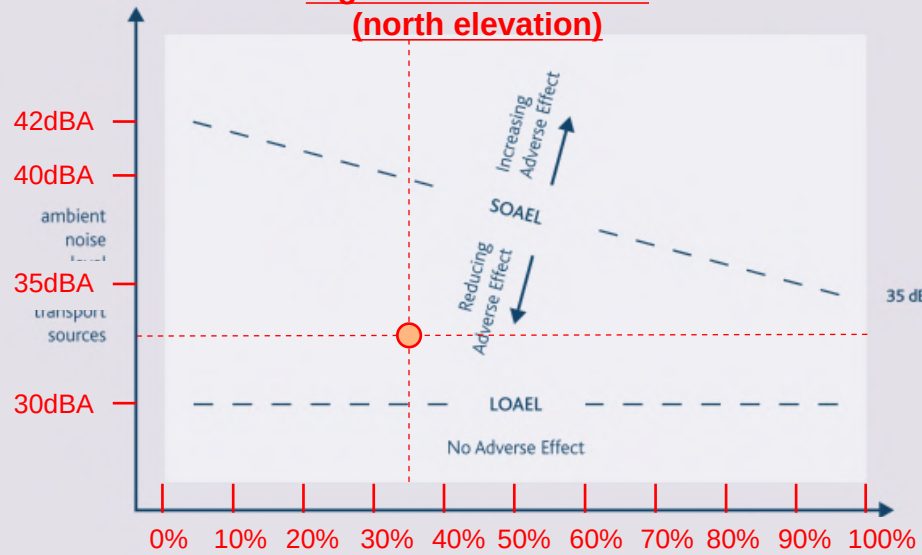


First Floor:
Block 2

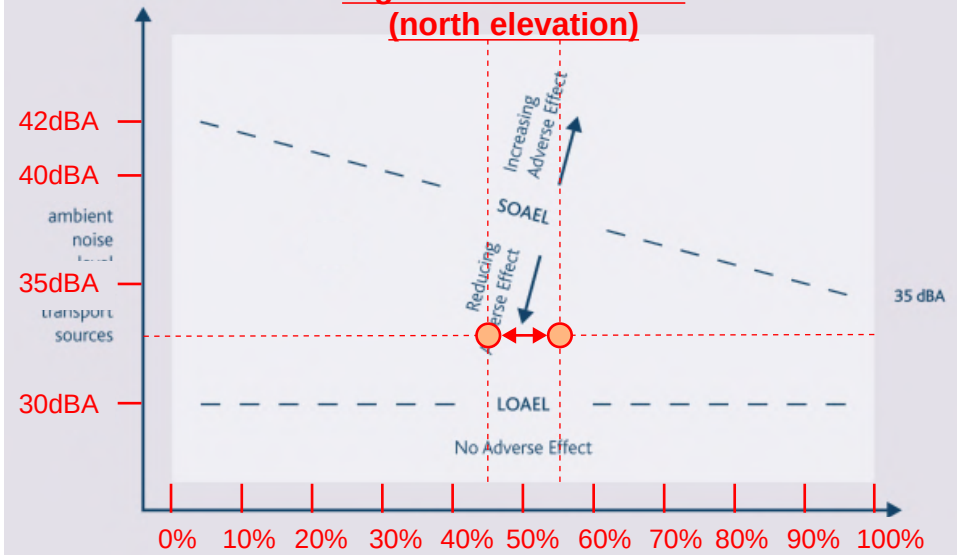
Daytime - Living Room
(north elevation)



Night time - Bedrooms
(north elevation)

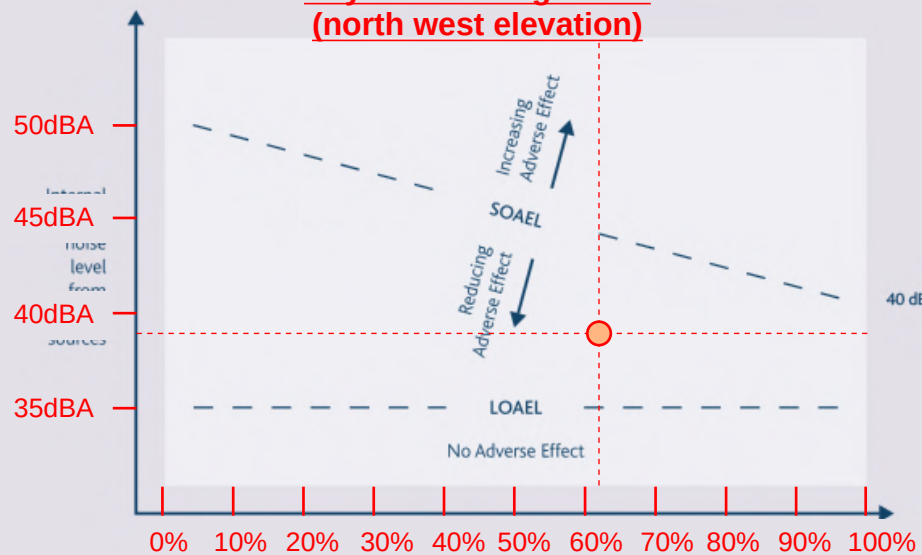


Night time - Bedrooms
(north elevation)

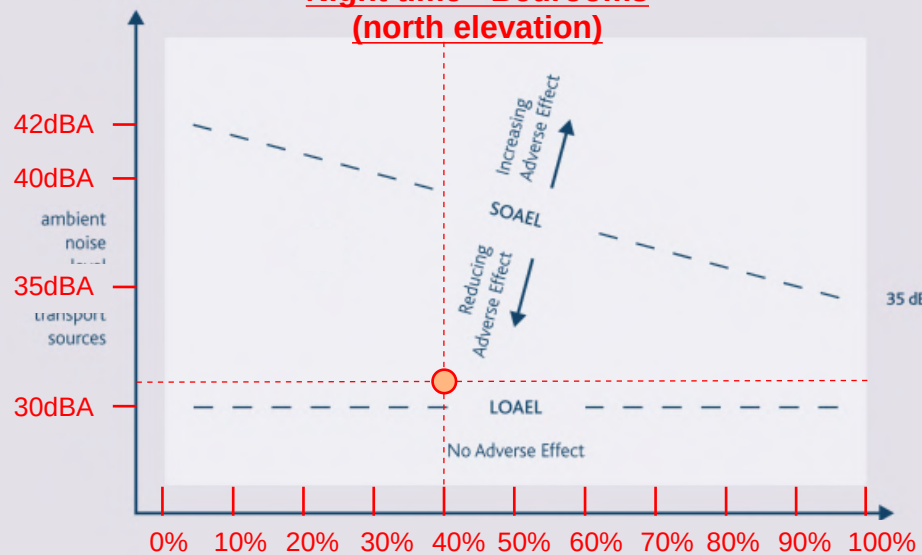


**Second Floor:
Block 1**

**Daytime - Living Room
(north west elevation)**

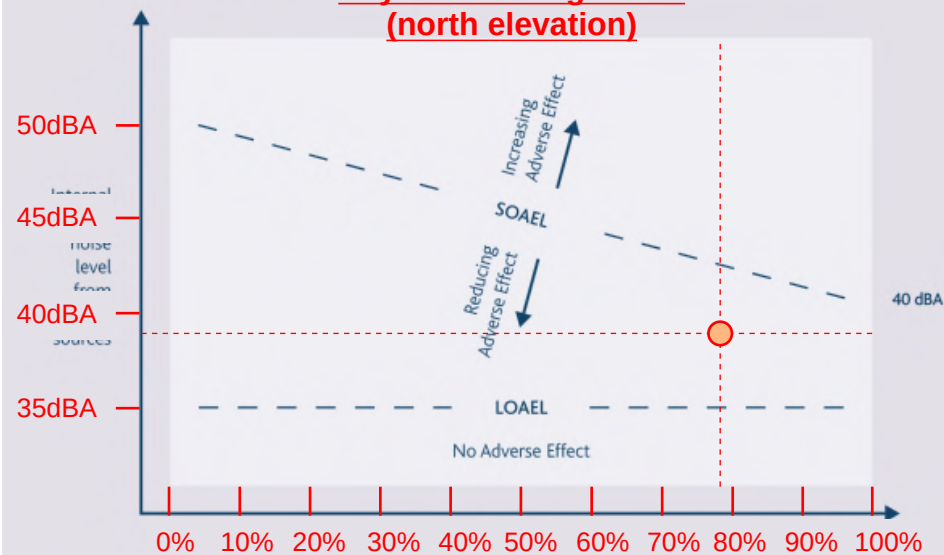


**Night time - Bedrooms
(north elevation)**

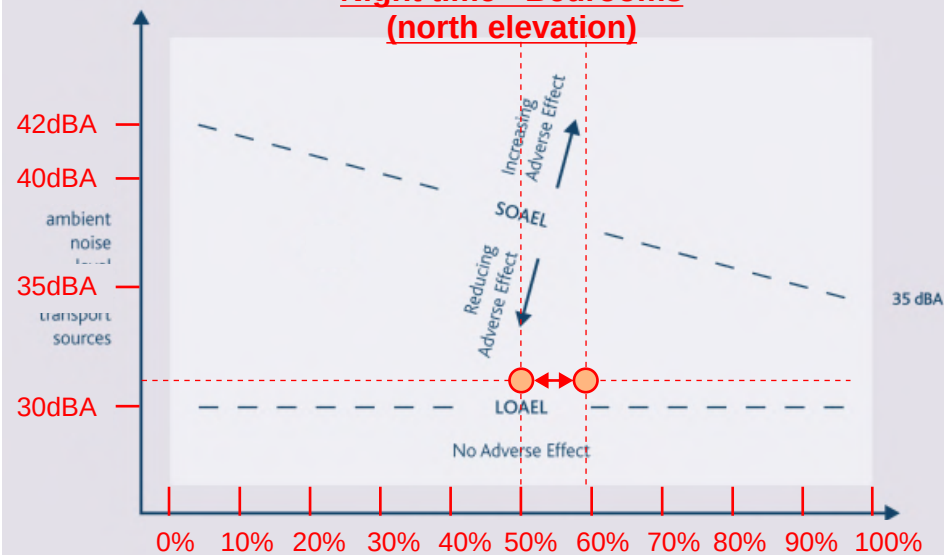


**Second Floor:
Block 2**

**Daytime - Living Room
(north elevation)**

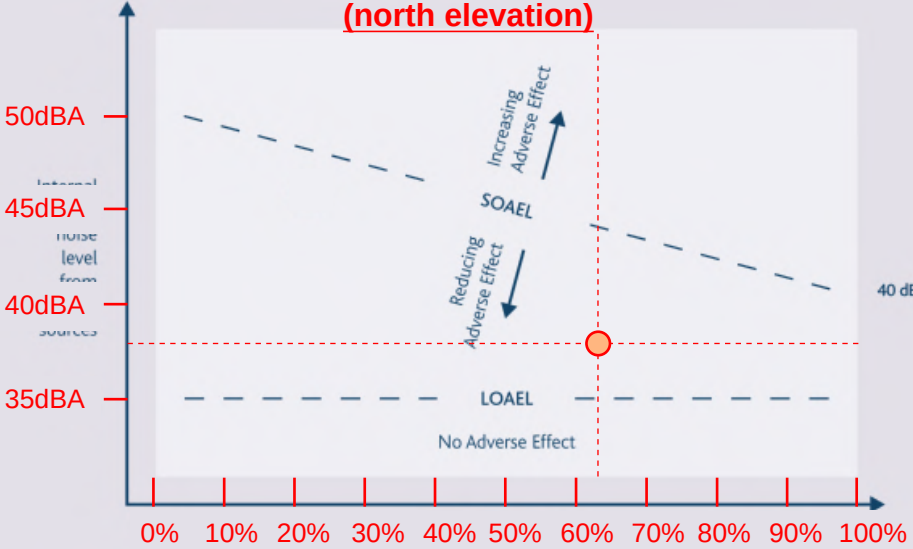


**Night time - Bedrooms
(north elevation)**



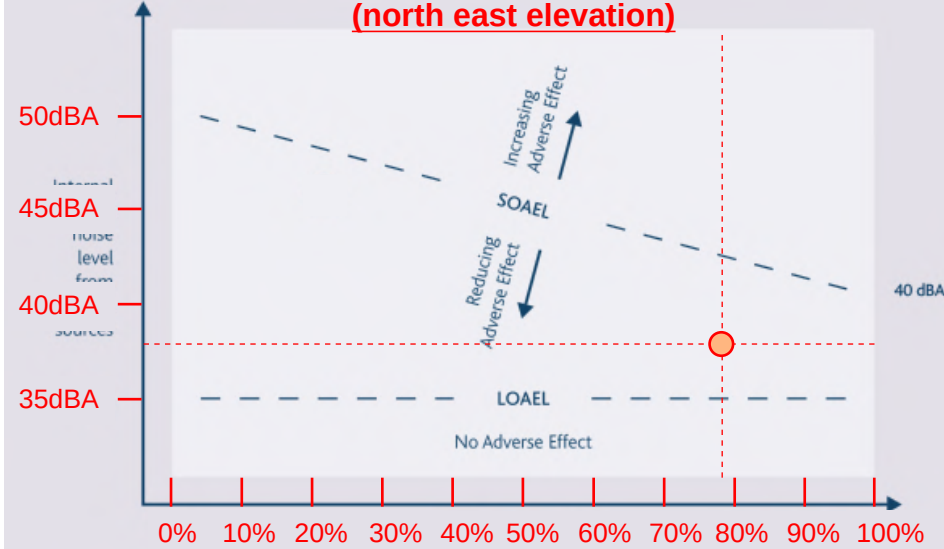
**Third Floor:
Block 1**

**Daytime - Living Room
(north elevation)**

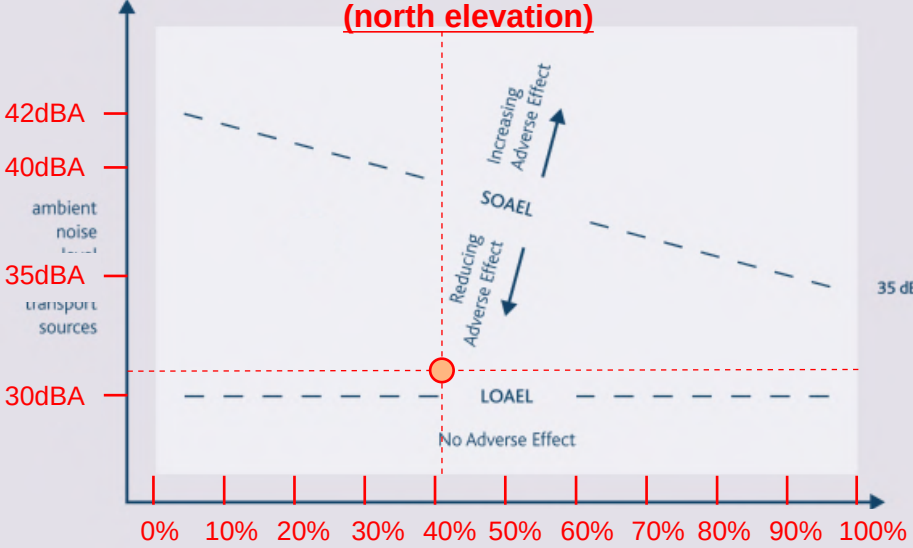


**Third Floor:
Block 2**

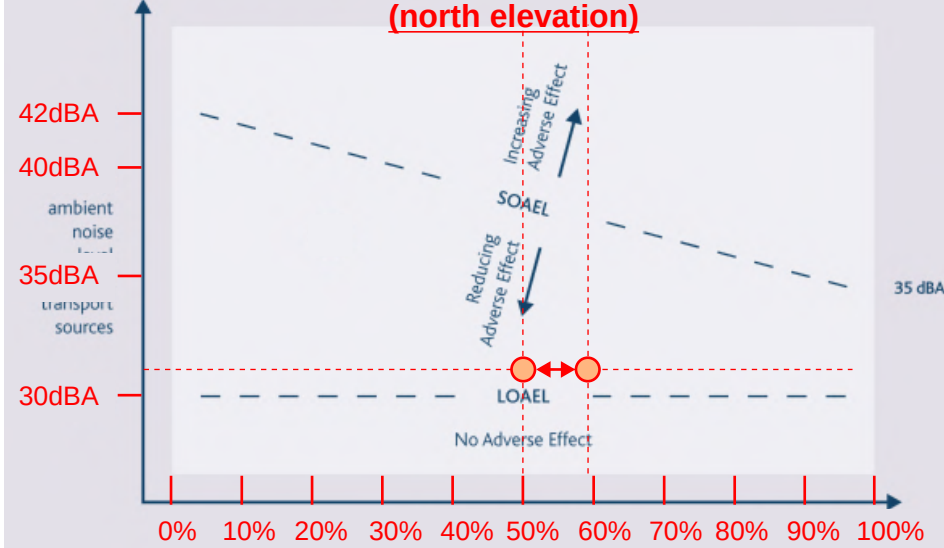
**Daytime - Living Room
(north east elevation)**



**Night time - Bedrooms
(north elevation)**

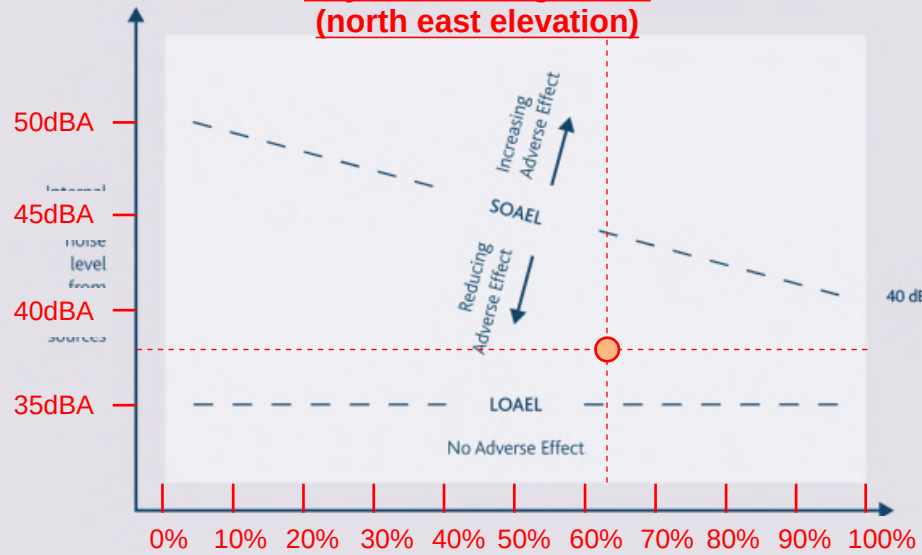


**Night time - Bedrooms
(north elevation)**

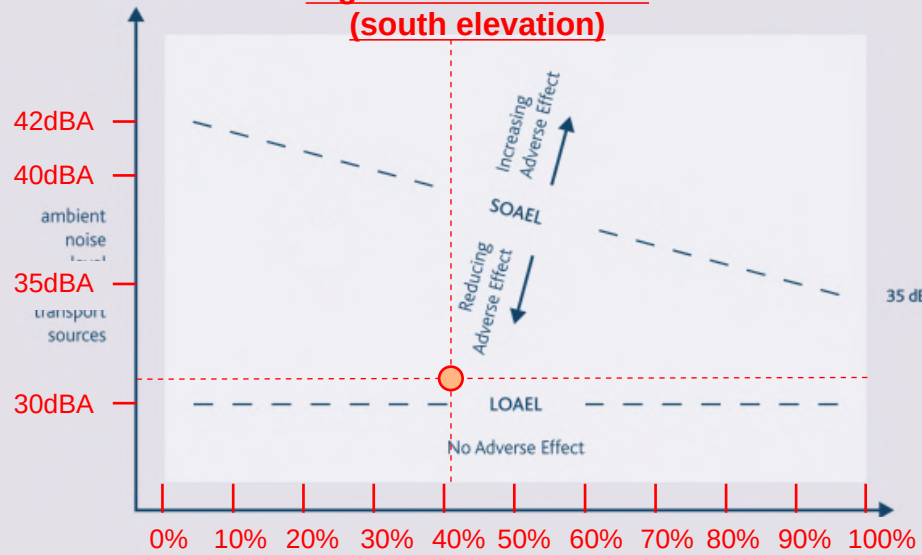


Fourth Floor:
Block 1

Daytime - Living Room
(north east elevation)

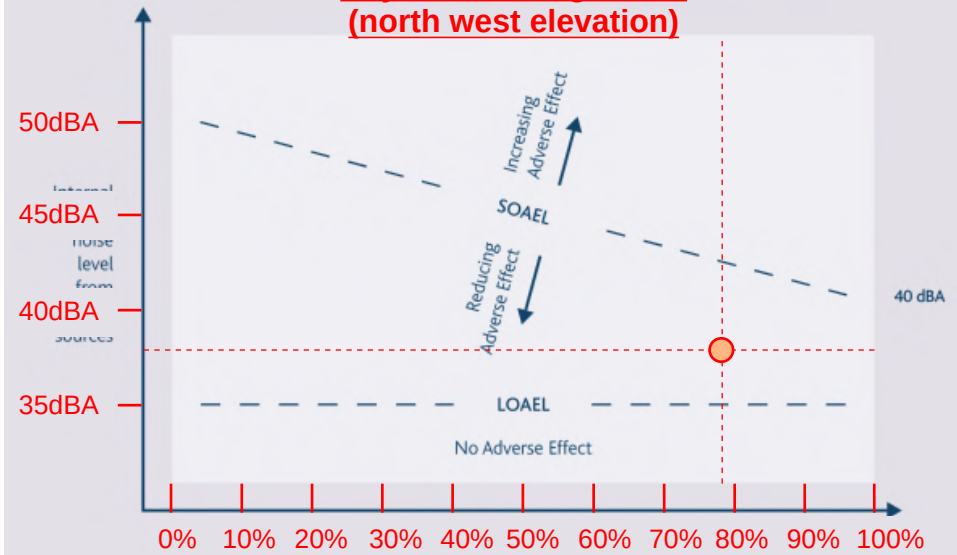


Night time - Bedrooms
(south elevation)

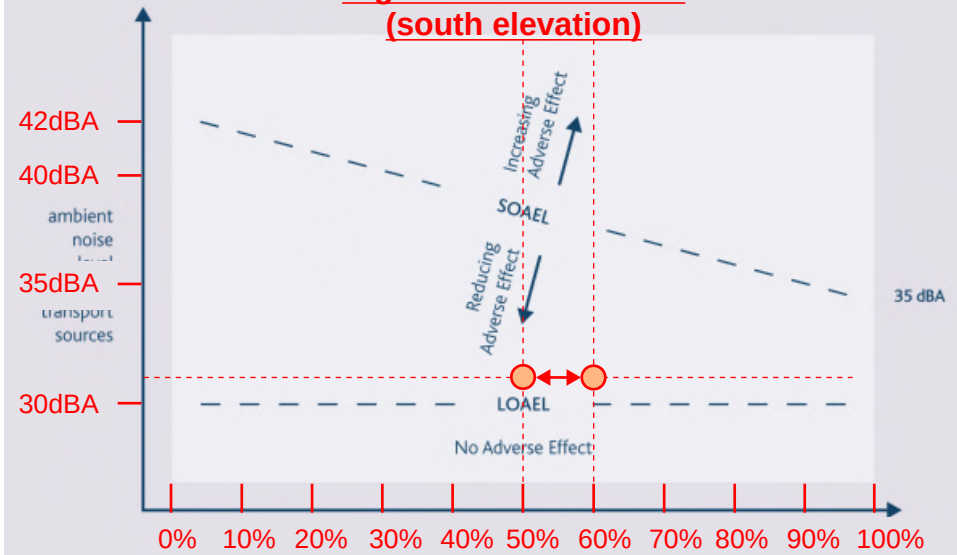


Fourth Floor:
Block 2

Daytime - Living Room
(north west elevation)

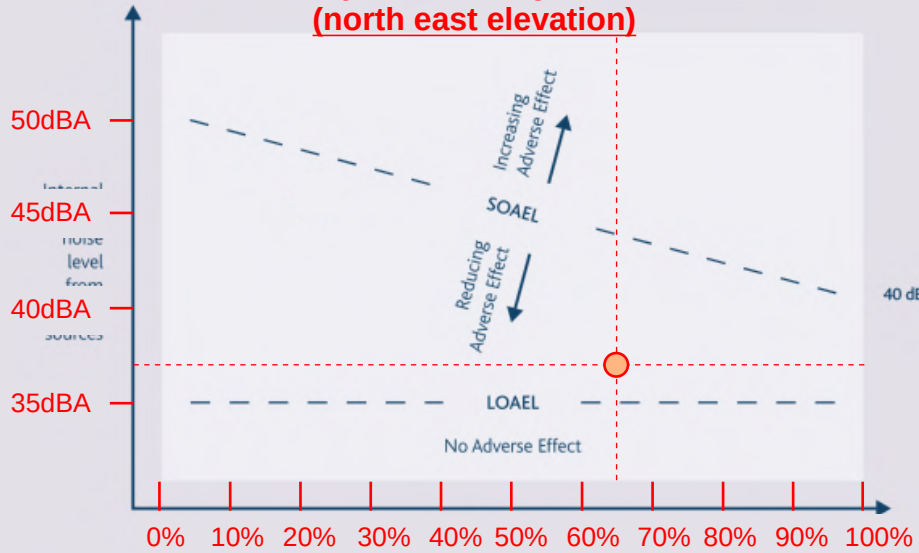


Night time - Bedrooms
(south elevation)

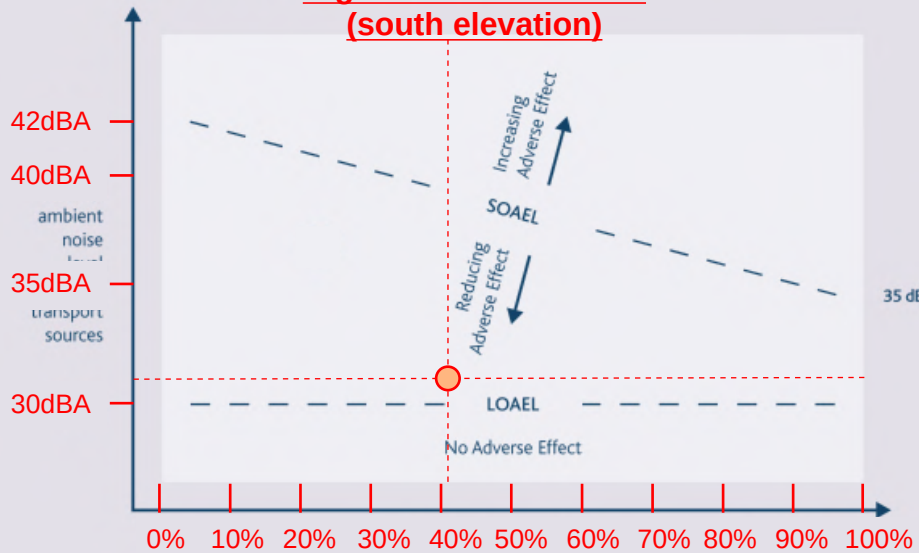


Fifth Floor:
Block 1

Daytime - Living Room
(north east elevation)

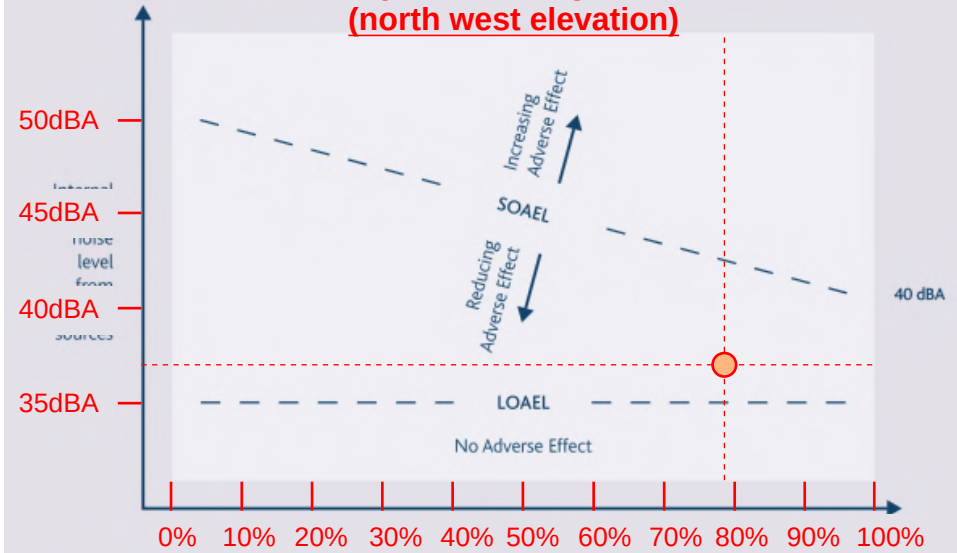


Night time - Bedrooms
(south elevation)

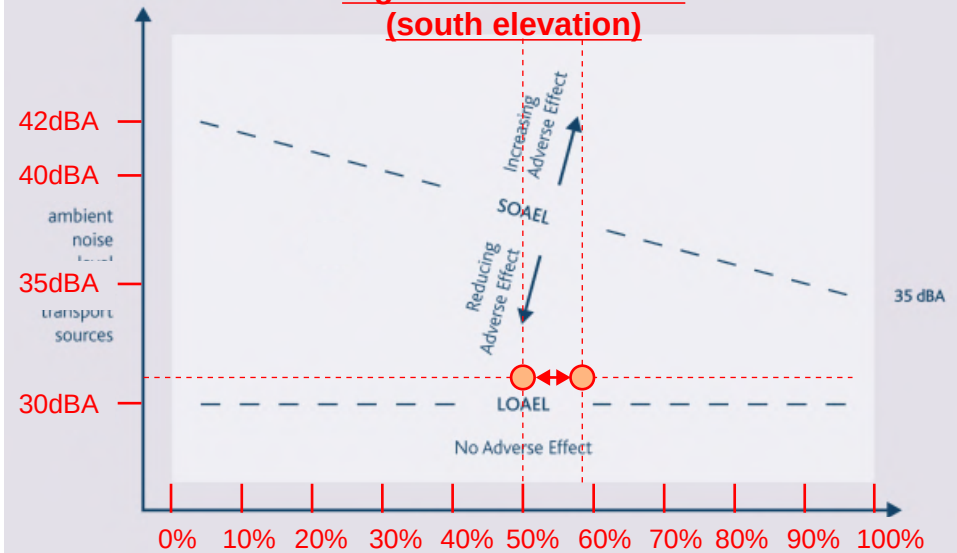


Fifth Floor:
Block 2

Daytime - Living Room
(north west elevation)

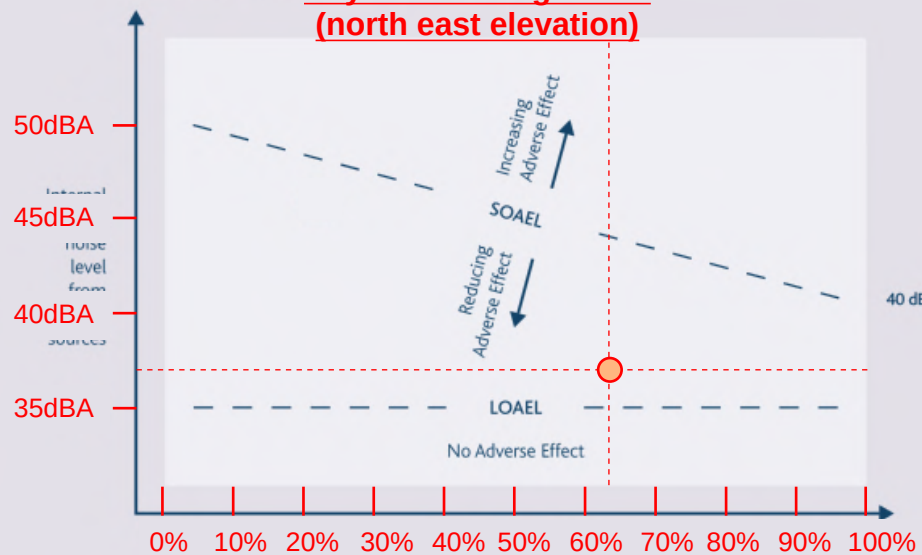


Night time - Bedrooms
(south elevation)



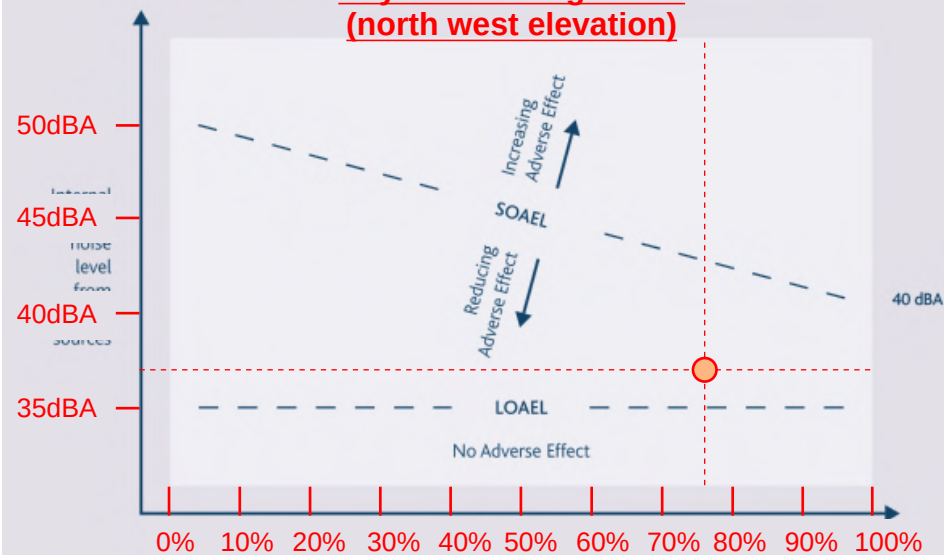
Sixth Floor:
Block 1

Daytime - Living Room
(north east elevation)

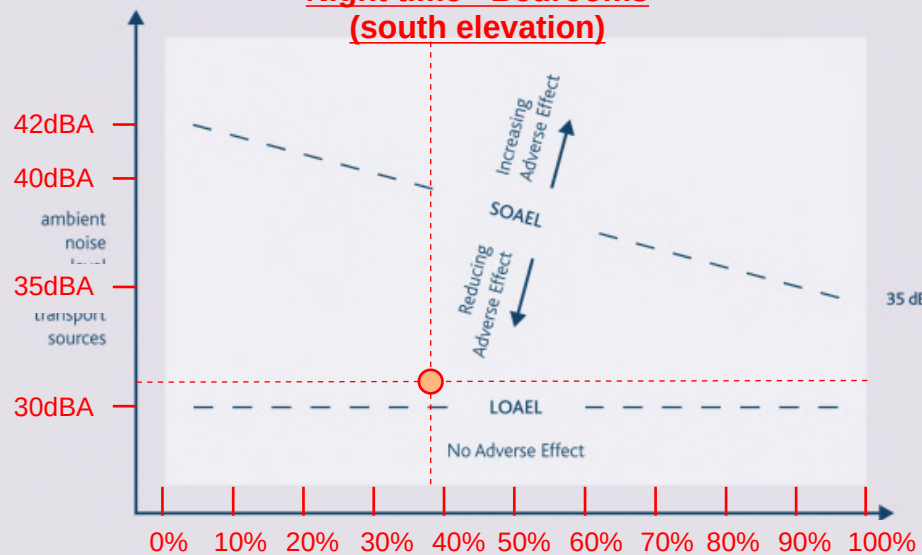


Sixth Floor:
Block 2

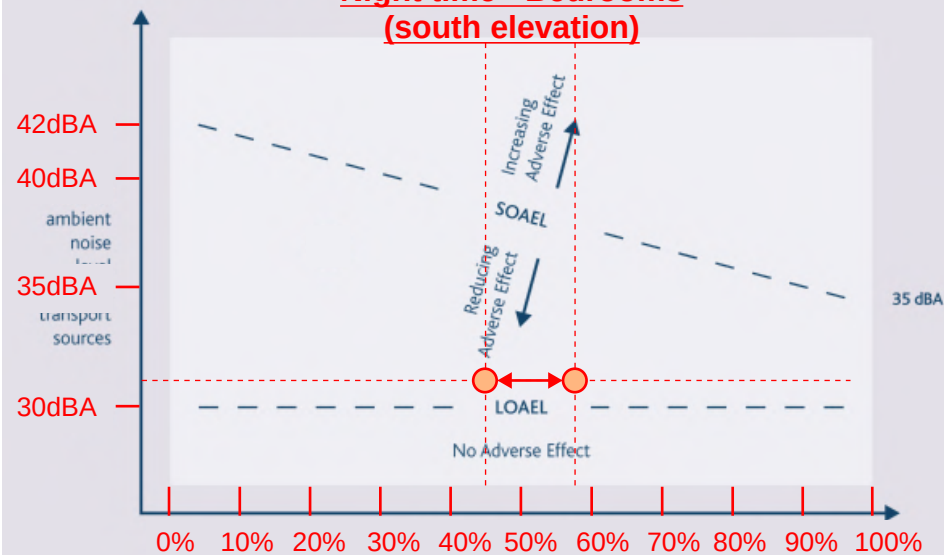
Daytime - Living Room
(north west elevation)



Night time - Bedrooms
(south elevation)

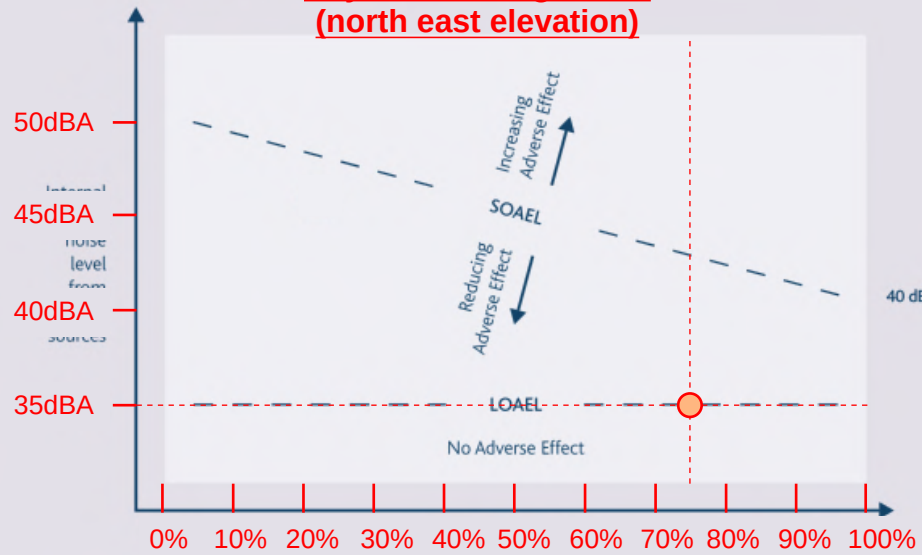


Night time - Bedrooms
(south elevation)



**Seventh
Floor; Block 1**

**Daytime - Living Room
(north east elevation)**



**Night time - Bedrooms
(south elevation)**

