

18-19 Bancroft, Hitchin Hertfordshire, SG5 1JQ

Proposed Mixed-Use Development Planning Noise Assessment

Report ref.

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Issued to

Selumi Investments Ltd & Holt End House Investments Ltd.

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1. INTRODUCTION

Selumi Investments Ltd & Holt End House Investments Ltd. are seeking planning permission for a mixed-use development at 18-19 Bancroft in Hitchin, Hertfordshire. The proposed development comprises of two commercial units, five apartments and five houses in the town centre. Consequently, a noise assessment is required.

Accordingly, Spectrum Acoustic Consultants has been instructed to carry out a noise assessment for the purpose of establishing the impact associated with the proposed development. This report provides the information required to inform and satisfy the requirements of the Local Planning Authority, for the purpose of determining the application.

2. SITE DESCRIPTION AND PROPOSALS

The proposed development site is located at 18-19 Bancroft, Hitchin, Hertfordshire, SG5 1JQ. The site comprises of a large retail unit currently occupied by Poundland which has a public car park over, accessed from Grammar School Walk to the rear. Bancroft bounds the site to the east and has a number of commercial properties located along it. Some of the properties on Bancroft have flats directly above. Opposite the site to the east is Hermitage Road which has a number of commercial and residential properties located along it. To the north and south of the site are commercial properties fronting on to Bancroft. At the rear of the site to the west is Grammar School Walk, beyond which is Hitchin Boys' School. An existing site location plan is included in Appendix A.

Proposals involve constructing two ground floor commercial units fronting on to Bancroft. Above the commercial units would be 5 apartments over three more floors. To the rear would be 3x three-storey high terrace town houses, as well as 2x semi-detached houses at the proposed development site. At this stage, the precise uses of the commercial units have yet to be determined. There would be a small communal garden at the rear of the proposed mixed-use building fronting on to Bancroft, as well as two small gardens at the rear of the semi-detached houses. The proposed scheme plans are included in Appendix B.

3. POTENTIAL NOISE IMPACTS

Noise issues of potential concern are considered to include:

1. The impact of existing ambient noise levels on the proposed residential properties.
2. The impact of noise from mechanical services plant equipment associated with the commercial units.



4. ASSESSMENT CRITERIA

4.1 PLANNING GUIDELINES

4.1.1 National Planning Policy Framework (NPPF), DLUHC, December 2024

The National Planning Policy Framework (NPPF)¹ sets out the Government's planning policies for England and how these should be applied by establishing a framework within which locally prepared plans for development can be produced.

The NPPF requires (187) that *'planning policies and decisions should contribute to and enhance the natural and local environment by: [...] preventing new and existing development from contribution to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of [...] noise pollution [...].'*

In relation to noise (198) *'Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should:*

'a) mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life²;

'b) identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason'

Planning policies and decisions should also (200) *'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'.*

Throughout the NPPF reference is made to other policies, such as the Noise Policy Statement for England (NPSE), which should also be applied as appropriate.

¹ National Planning Policy Framework, MHCLG, December 2023

² See Explanatory Note to the Noise Policy Statement for England, paragraphs 2.23 and 2.24, DEFRA, 15 March 2010.



4.1.2 Noise Policy Statement for England (NPSE), DEFRA, March 2010

The NPPF refers to the Noise Policy Statement for England (NPSE) which sets out the long term vision of Government noise policy as follows: *Promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.*

The first aim of the Noise Policy Statement for England

Avoid significant adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

- 2.23 The first aim of the NPSE states that significant adverse effects on health and quality of life should be avoided while also taking into account the guiding principles of sustainable development (paragraph 1.8).

The second aim of the Noise Policy Statement for England

Mitigate and minimise adverse impacts on health and quality of life from environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development.

- 2.24 The second aim of the NPSE refers to the situation where the impact lies somewhere between the Lowest Observed Adverse Effect Level (LOAEL) and the Significant Observed Adverse Effect Level (SOAEL). It requires that all reasonable steps should be taken to mitigate and minimise adverse effects on health and quality of life while also taking into account the guiding principles of sustainable development (paragraph 1.8). This does not mean that such adverse effects cannot occur.

The third aim of the Noise Policy Statement for England

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

- 2.25 This aim seeks, where possible, positively to improve health and quality of life through the proactive management of noise while also taking into account the guiding principles of sustainable development (paragraph 1.8), recognising that there will be opportunities for such measures to be taken and that they will deliver potential benefits to society. The protection of quiet places and quiet times as well as the enhancement of the acoustic environment will assist with delivering this aim.

4.1.3 Planning Practice Guidance – Noise (PPG)

The PPG sets out government guidance on the role of noise in the planning process. This provides advice on issues such as when noise is relevant to planning, how to determine noise impact, discussion on the context of noise and how the impact of noise can be mitigated.

Of relevance to this scheme, it advises that “Noise needs to be considered when ...new developments would be sensitive to the prevailing acoustic environment.” Whilst it does advise that noise can override other planning concerns, it states that as with the NPSE and the NPPF it does not expect noise to be



considered in isolation from other economic, social and environmental dimensions of a proposed development.

It asks an LPA to consider

- *whether or not a significant impact is occurring or likely to occur;*
- *whether or not an adverse effect is occurring or likely to occur;*
- *whether or not a good standard of amenity can be achieved.*

This includes identifying whether the noise exposure is above or below SOAEL or LOAEL.

The PPG talks about “impact” and “effect”. This is an important part of the context discussion, as a noise source may have a significant impact for brief period of time, but because the impact is only brief, the overall “effect” is not significant, as it does not materially affect behaviour.

The PPG summarises examples of the perception of noise, with the outcome and the effect level:

- No observed effect: Noise is not noticeable, and no specific measures are required. This would correlate to NOEL of the NPSE;
- No observed adverse effect: Noise is noticeable and not intrusive, does not cause any change in behaviour or attitude, can affect the acoustic character of an area but not such that there is a perceived change in the quality of life. No specific measures are required;
- Observed adverse effect: Noise causes small changes in behaviour (eg closing windows for some of the time because of the noise), potential for some sleep disturbance, and there is a perceived change in the quality of life. In this case noise should be mitigated and reduced to a minimum as it represents the onset of the LOAEL as defined in the NPSE;
- Significant observed adverse effect: Noise causes a material change in behaviour and attitude (eg avoiding certain activities during periods of intrusion, or having to keep windows closed most of the time because of the noise where there is no alternative ventilation), potential for difficulty getting back to sleep, quality of life diminished. This correlates to a SOAEL as defined by the NPSE and should be avoided.
- Unacceptable adverse effect: Extensive and regular changes in behaviour and/or an inability to mitigate effects, leading to psychological stress and physiological effects (eg regular sleep deprivation, medically definable harm). This, the PPG advises, should be prevented.

It is of note that the examples given in the PPG relate to changes of behaviour, changes to quality of life and changes in the character of an area. In the case of this development, residents would be moving into an existing situation, so behaviours would not change, as no pattern of behaviour is already established.

This is reflected formally in paragraph 007 of the PPG. This paragraph helps the LPA consider the balance between planning and statutory nuisance (Environmental Protection Act 1990). It states that “*When assessing whether a statutory nuisance exists, local authorities will consider a number of relevant factors including the noise level, its duration, how often it occurs, the time of day or night that it occurs and the*



'character of the locality'. The factors influencing the 'character of the locality' may include long-established sources of noise in the vicinity, for example church bells, industrial premises, music premises or public houses'."

As stated in the NPSE, there is no simple relationship between noise levels and the effect of those noise levels. The NPSE lists a number of factors as relevant, and the following are those that apply to this scheme:

- Source and level of noise;
- Number of noise events, how often they occur, and the pattern;
- The spectral content of the noise and its character;
- Whether noise effects can be mitigated by closing windows, allowing for alternative ventilation to be provided;
- The acoustic environment in external amenity spaces where they are an intrinsic part of the overall design;
- The effect on a nearby existing business.

The PPG says that for development, mitigation can be considered in terms of engineering (reducing noise at source, or containing it). This is unlikely to be practicable in a case like this, as the proposed developer would need to rely on the goodwill (unless formal agreements could be reached) with those responsible for the source of the noise. However, layout (orientating site to minimise impact, and including screening), planning conditions, and mitigation to the dwellings themselves are all likely to be feasible.

Such mitigation techniques are therefore recognised by the PPG as normal practice in the case of noise sensitive schemes.

The noise impact can also be offset where residents have access to a quiet facade, a quiet external amenity space for their sole or shared use, or a public amenity space nearby.

4.2 CRITERIA FOR ASSESSMENT

4.2.1 WHO – Environmental Noise Guidelines for the European Region 2018

New guidance from WHO titled Environmental Noise Guidelines for the European Region (ENG) was published in 2018. The document takes a very different approach to guidance set out in the previous WHO Guidelines for Community Noise 1999 (GCN) document by identifying separate thresholds for specific sources, rather than for community noise as a whole. Consequently, much of the earlier guidance set out in GCN is now absent from ENG. While ENG was intended to supersede GCN, it recognises this absence and states that *'indoor guideline values and any values not covered by the current guidelines (such as industrial noise and shopping areas) should remain valid.'*

4.2.2 WHO – Guidelines for Community Noise, 1999

Guidelines for Community Noise - World Health Organization (GCN) gives guidance on suitable noise levels for sleeping and resting conditions in dwellings. It sets out these values in table 4.1, and lists them as being guideline values for community noise. The document defines community noise (also called environmental noise, residential noise or domestic noise) as noise emitted from all sources, except noise



at the industrial workplace. Main sources of community noise include road, rail and air traffic, industries, construction and public work, and the neighbourhood.

WHO recommends internal noise levels of 30dB(A) at night for bedrooms, and 35dB(A) during the day for living-rooms. The guideline levels are based on annual average data.

To avoid sleep disturbance in bedrooms during the night time period, it also recommends that noise levels from single sound events should not regularly exceed L_{Amax} 45dB(A). WHO defines 'regular' as not more than 10-15 events per night.

WHO also gives guidance on suitable noise levels for outdoor living areas such as gardens. The WHO guidelines state that *"to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed 55 dB L_{Aeq} for a steady continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50 dB L_{Aeq} "*.

The preface to WHO states that community noise includes road, rail and air traffic, industries, construction and public work, and the neighbourhood. Therefore, although these noise levels are usually used to determine acceptability from steady continuous noise from anonymous sources, such as road traffic or rail movements, they provide helpful guidance when considering noise from commercial sources.

4.2.3 BS 8233:2014 guidance on sound insulation and noise reduction for buildings

BS 8233:2014 *Guidance on sound insulation and noise reduction for buildings* gives guidance on indoor ambient noise levels to be achieved in dwellings for reasonable resting and sleeping conditions. The guidance in BS 8233:2014 is based on guidelines issued by the WHO, Guidelines for Community Noise (1999).

In Section 7.7.1 of BS 8233:2014, it states that it applies to external noise as it affects the internal acoustic environment from sources without a specific character, previously termed "anonymous noise". However, it then goes on to state that if the noise has a specific character, if it contains features such as a distinguishable, discrete and continuous tone, is irregular enough to attract attention, or has strong low-frequency content, in which case lower noise limits might be appropriate.

The BS 8233:2014 guideline levels are shown in Table 1.

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

Table 1: BS 8233 guideline noise level limits in dwellings for resting and sleeping

BS 8233 advises that *"If relying on closed windows to meet the guide values, there needs to be an appropriate alternative ventilation that does not compromise the facade insulation or the resulting noise level. If applicable, any room should have adequate ventilation (e.g. trickle ventilators should be open) during assessment."*

It also advises that *"Where development is considered necessary or desirable...the internal target levels may be relaxed by up to 5 dB and reasonable conditions still achieved."*



The standard also advises that *“Regular individual noise events (for example, scheduled aircraft or passing trains) can cause sleep disturbance. A guideline value may be set in terms of SEL or L_{AFmax} depending on the character and number of events per night. Sporadic noise events could require separate values.”* It does not give guidance on what might constitute a guideline value. However, as the standard does cross reference Guidelines for Community Noise - World Health Organization, 1999 (WHO), it is suggested that the guideline value of L_{AFmax} 45 dB, inside bedrooms, should not be exceeded during the night more than 10-15 times, which reflects the WHO position.

BS 8233:2014 suggests the following guidelines for noise levels in external spaces that are used for amenity space, such as gardens and patios. *“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper 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.”*

4.2.4 BS 4142:2014+A1:2019 Methods for rating and assessing industrial and commercial sound

The principle of BS 4142 is to determine an initial estimate of impact of industrial/commercial sound on nearby residents by comparing the Rating Level (sound level from the industrial/commercial source, with a correction applied for any acoustic features that characterise the sound) with the Background Sound Level (L_{A90} as measured in absence of the industrial/commercial source).

Generally, the greater the difference by which the Rating Level exceeds the Background Sound Level, the greater the magnitude of impact. BS 4142 states that *‘a difference of around +10 dB or more is likely to be an indication of a significant adverse impact [...]. A difference of around +5 dB is likely to be an indication of an adverse impact [...]. Where the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact.’*

However, BS 4142 also advises that *‘when making assessments and arriving at decisions [...] it is essential to place the sound in context’* so in each case, the context in which the sound is placed must be considered and the initial estimate of impact should be modified accordingly.

For example, it advises *‘Where background sound levels and rating levels are low, absolute levels might be as, or more, relevant than the margin by which the rating level exceeds the background. This is especially true at night.’* It also indicates that impacts estimated during *‘the middle of the night can be distinctly different (and potentially of lesser importance) compared to the start or end of the night-time period for sleep purposes.’*



4.3 APPROVED DOCUMENT O – OVERHEATING, DCLG, 2021

Section 3 of ADO is intended to ensure the overheating mitigation strategy is usable, with paragraph 3.2 to 3.4 relating to noise.

The key noise requirements are set out in paragraphs 3.2 and 3.3:

3.2 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 (11pm to 7am).

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

- a. 40dB $L_{Aeq,T}$ averaged over 8 hours (between 11pm and 7am).*
- b. 55dB L_{AFmax} , more than 10 times a night (between 11pm and 7am).*

5. SITE NOISE MEASUREMENT SURVEY

5.1 MEASUREMENT LOCATIONS

For the purpose of the assessment, noise measurements were carried out at locations, representative of the most sensitive areas of the proposed development. These are described as follows:

Position 1 – Corner of Poundland loading bay, Grammar School Walk, 2m above ground.

Position 2 – Southern corner boundary of car park at first floor level.

Position 3 – Poundland roof top overlooking Bancroft.

The locations are illustrated on the existing site location plan, included in Appendix A

5.2 SURVEY DETAILS AND INSTRUMENTATION

Noise measurements were completed over the period Wednesday 5 to Monday 10 June 2024. Throughout the survey, weather conditions were mild with occasional light rain showers. Continuous automated five-minute noise measurements were carried out at the selected monitoring locations.

Noise measurement parameters consisted of equivalent continuous (L_{Aeq}) noise levels and maximum (L_{Amax}) noise levels, as well as statistical noise levels (termed L_n , where n is the percentage of time the level is exceeded during the measurement period). Both overall and 1/1 octave band measurements were stored for later analysis.

The following instrumentation was used during the measurement survey:

- Bruel & Kjaer Type 2250 Sound Level Meter s/n 3023840
- Bruel & Kjaer Type 4189 Microphone s/n 3130623
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3030524
- Bruel & Kjaer Type 2250 Sound Level Meter s/n 3024396
- Bruel & Kjaer Type 4189 Microphone s/n 3349664
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3021281



- Bruel & Kjaer Type 2250 Sound Level Meter s/n 3024398
- Bruel & Kjaer Type 4189 Microphone s/n 3147720
- Bruel & Kjaer Type 4231 Acoustic Calibrator s/n 3021283

Before and after the survey, the sound level meters were field-calibrated in accordance with the manufacturer's guidelines, and no significant drift was observed. The meters, microphones and field calibrators are laboratory calibrated biennially in accordance with UKAS procedures or to traceable National Standards.

The instrumentation recorded short audio samples at timed intervals and selected individual events using a trigger to allow identification of noise sources.

5.3 SURVEY RESULTS

During the daytime, noise levels at the front of the site are dominated by road traffic movements and pedestrians on Bancroft. At the rear of the site, noise levels are dominated by distant road traffic movements and mechanical services plant associated with the existing Poundland store. During the night-time ambient noise levels reduce.

The measured noise profiles at the noise monitoring locations are shown in the following charts.

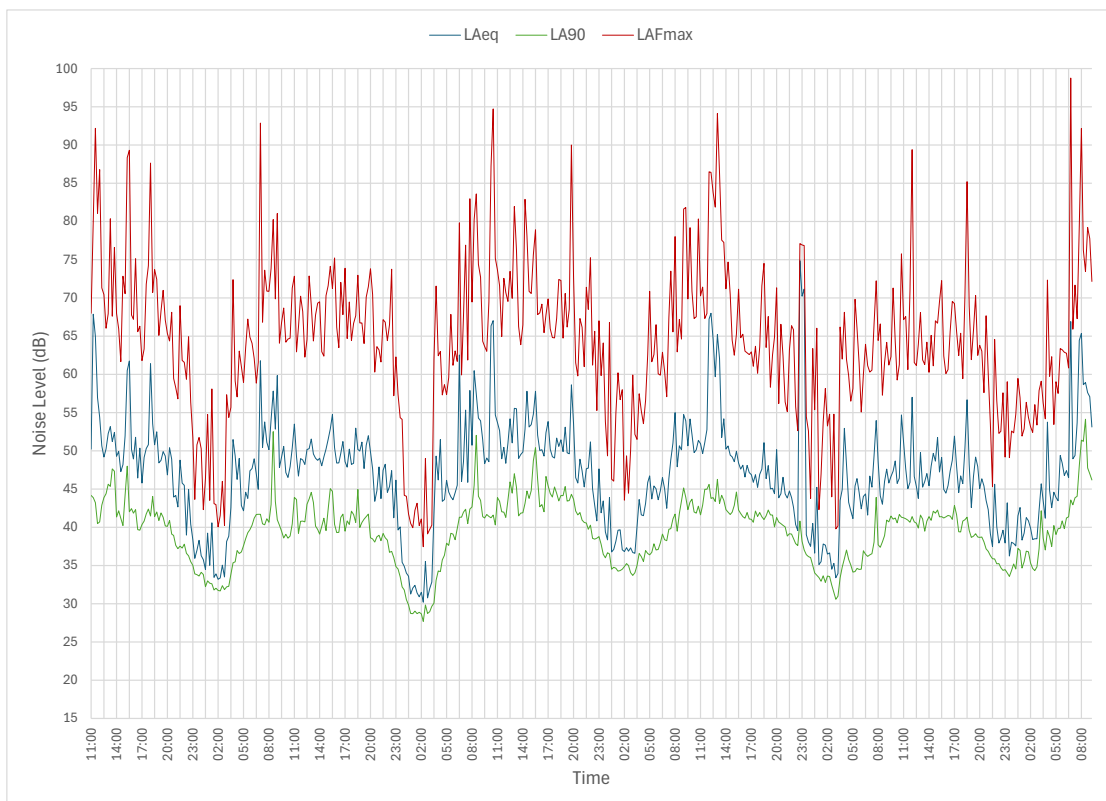


Chart 1: Corner of Poundland loading bay, Grammar School Walk - Wednesday 5 to Monday 10 June 2024

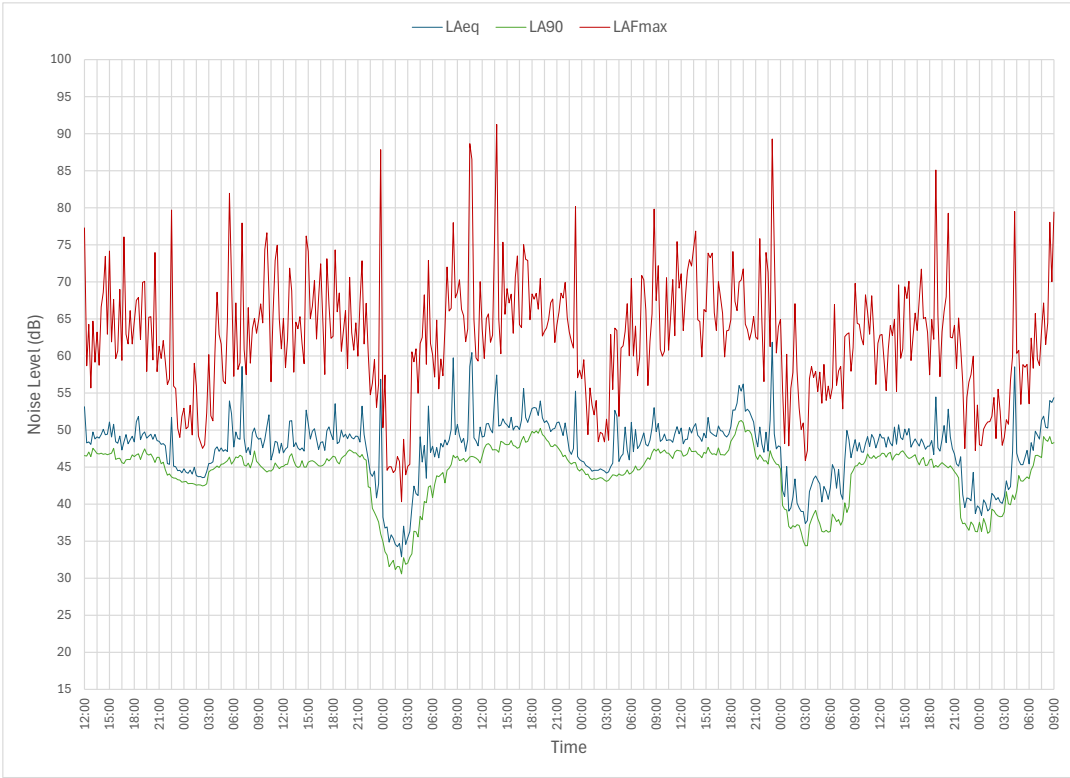


Chart 2: Southern corner boundary of car park - Wednesday 5 to Monday 10 June 2024

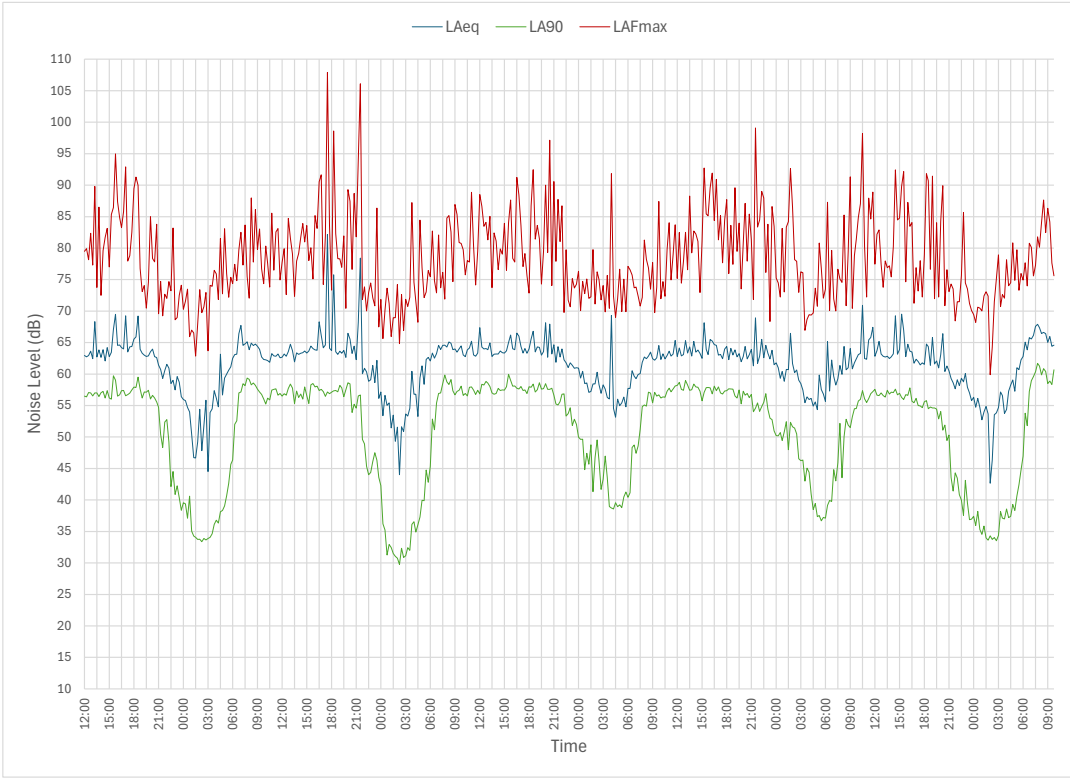


Chart 3: Poundland roof top overlooking Bancroft - Wednesday 5 to Monday 10 June 2024



For the purpose of establishing the noise impact on the proposed dwellings, a summary of the measured noise data over the daytime and night-time periods is included in Table 2 below. The overall $L_{Aeq,16\text{ hour}}$ and $L_{Aeq,8\text{ hour}}$ have been taken from the average of all of the daytime and night-time noise measurements.

World Health Organisation (WHO) guidelines for community noise, define regular as not more than 10-15 events per night. Therefore, the L_{Amax} levels measured during the night-time periods have been sorted from highest to lowest. It is then possible to read off the 10-15th highest L_{Amax} levels during each of the night-time periods which are regarded as being typical. The typical L_{Amax} values for each of the night-time periods obtained in this survey are included in Table 2.

Measurement Location	Date	Daytime L_{Aeq} (dB) 0700-2300	Night-time L_{Aeq} (dB) 2300-0700	Night-time typical (10 th highest) L_{Amax}^1 (dB)
Position 1 Corner of Poundland loading bay, Grammar School Walk.	Wednesday 05.06.2024	56	44	62
	Thursday 06.06.2024	52	49	62
	Friday 07.06.2024	55	43	62
	Saturday 08.06.2024	59	59	65
	Sunday 09.06.2024	49	53	63
	Monday 10.06.2024	60	-	-
	Overall	56	53	65
Position 2 Southern corner boundary of car park.	Wednesday 05.06.2024	49	47	60
	Thursday 06.06.2024	50	46	61
	Friday 07.06.2024	52	48	63
	Saturday 08.06.2024	51	48	62
	Sunday 09.06.2024	48	47	59
	Monday 10.06.2024	52	-	-
	Overall	50	48	63
Position 3 Poundland roof top overlooking Bancroft.	Wednesday 05.06.2024	64	59	75
	Thursday 06.06.2024	68	59	76
	Friday 07.06.2024	64	60	75
	Saturday 08.06.2024	64	61	83
	Sunday 09.06.2024	64	59	75
	Monday 10.06.2024	66	-	-
	Overall	65	59	83

Table 2: Summary of results of ambient noise survey

Note: 1 The L_{Amax} data is only relevant to the night-time period

During the daytime, noise levels across the site are $L_{Aeq,16\text{ hour}}$ 50-65dB. During the night-time, noise levels across the site are $L_{Aeq,8\text{ hour}}$ 48-59dB, with maximum levels typically in the range L_{AFmax} 63-83dB.

When determining the representative background $L_{A90,T}$ levels for the relevant periods, BS 4142³ guidance states “a representative level ought to account for the range in background levels and ought not automatically to be assumed to be either the minimum or modal value.” With this in mind, statistical analysis has been used to determine the typical background $L_{A90,T}$ noise levels for the sensitive periods. The analysis derived the Mode, Mean and Mean -1 standard deviation values. Once these three values have been established, a judgement was then made as to which value is considered representative. In this instance the mean and modal values were used, as they are considered to be representative.

Measurement Location	Period	Representative $L_{A90,T}$ (dB)
Position 1 Corner of Poundland loading bay, Grammar School Walk.	Daytime 07:00 – 23:00	41
	Night-time 23:00 – 07:00	34
Position 2 Southern corner boundary of car park.	Daytime 07:00 – 23:00	46
	Night-time 23:00 – 07:00	41
Position 3 Poundland roof top overlooking Bancroft.	Daytime 07:00 – 23:00	56
	Night-time 23:00 – 07:00	34

Table 3: Summary of representative background $L_{A90,T}$ levels

6. PREDICTION OF ENVIRONMENTAL NOISE LEVELS AT INDIVIDUAL BUILDING FACADES

The proposed development comprises of habitable rooms at various heights, distances and aspects relative to the Bancroft and other nearby roads. As a result, the noise levels affecting different parts of the proposed development will be subject to differing levels of distance attenuation, screening and angle of view to the road. Therefore, analysis has been undertaken to predict the noise levels at the various residential facades of the dwellings, based on the measurement results and taking these effects into account.

The procedure that has been followed is as summarised below:

- Generate a three-dimensional numerical noise model of the site conditions at the time of the survey using DGMR's 'iNoise 2024.1' software. This acoustic model implements the procedures set out in ISO 9613-2:1996 “Acoustics – Attenuation of sound during propagation outdoors Part 2: General method of calculation to determine noise levels”.
- Validate the noise prediction model against noise measurement data taken at the site and reported in Section 4.3. This validation is carried out in respect of daytime and night-time $L_{Aeq,T}$ levels, as well as night-time $L_{Amax,typ}$ for road traffic noise. The octave band frequency levels of the noise predictions are also taken from the measurements carried out at the site.
- Alter the noise model to replace the physical configuration at the time of the measurements with the proposed new scheme.

³ BS 4142:2014 Methods for rating and assessing industrial and commercial sound



- Predict noise levels at numerous locations across the façades of the houses, representative of the proposed residential windows. A graphical representation of this model is shown in Appendix C.
- Use these noise level predictions as the starting point for intrusive noise calculations at key locations on the development.
- Compare predicted indoor noise levels against the guideline noise levels in terms of:
 - * - $L_{eq,T}$ noise levels in living rooms and bedrooms during the daytime (i.e. $L_{Aeq,T}$ 30 dB)
 - * - $L_{eq,T}$ noise levels in bedrooms during the night-time (i.e. $L_{Aeq,T}$ 30 dB), and
 - * - L_{Amax} noise levels in bedrooms during the night-time (i.e. $L_{Amax,typ}$ 45 dB)
- Using measured sound insulation data for standard façade components, set the sound insulation specifications for the relevant façade components necessary to meet the target noise levels (more information on this in Section 7.2).

Detailed results of day-time and night-time $L_{Aeq,T}$ levels at the noisiest locations are shown in Appendix C, corresponding to the calculation positions also included in Appendix C. All octave band levels listed in Appendix C are A-weighted.

The $L_{Amax,typ}$ levels have been calculated in the following way. The $L_{Amax,typ}$ measured at the monitoring locations is from a single, short-term event at one location and not the aggregate of noise from all points on the road network. Therefore, the $L_{Amax,typ}$ model includes a series of point sources, rather than line sources (as for the L_{Aeq} model). Accordingly, the single highest sound pressure level at each receptor location from an individual point source is taken to be the $L_{Amax,typ}$ for design purposes. The measured L_{max} frequency distribution (i.e. spectrum) has been also been used in this way within the predictions.

7. ASSESSMENT OF NOISE

7.1 PROPOSED COMMERCIAL UNITS

The proposed mechanical services plant equipment associated with the commercial units fronting on to Bancroft has yet to be determined. Consequently, noise limit criteria in the form of the rating noise level from mechanical services plant should be designed to not exceed the background levels at the nearest noise sensitive receptors.

Table 4 summarises the rating levels not to be exceeded, in accordance with BS 4142:2014+A1:2019 *Methods for rating and assessing industrial and commercial sound*:

Period	Rating Level not to be exceeded at 1m from the nearest noise sensitive premises (dB)
Daytime (07:00-23:00)	41
Night-time (23:00-07:00)	34

Table 4: Noise limits for mechanical services plant, in accordance with BS 4142:2014+A1:2019



In line with BS 4142, the rating noise level includes any correction for the any acoustic characteristics of mechanical services plant noise (e.g. noise that is tonal, impulsive, or will otherwise attract attention).

The above limits apply to all new items of services plant, running simultaneously at the appropriate design duty.

7.2 PROPOSED RESIDENTIAL UNITS

7.2.1 Professional practice guidance on planning and noise (PROPG) – New residential development, ANC/IOA/CIEH, May 2017

ProPG advises that the high noise levels at the front of the site *indicate that there is an increased risk that development may be refused on noise grounds. This risk may be reduced by following a good acoustic design process that is demonstrated in a detailed ADS.*

The opportunity for consideration of a Good Acoustic Design Process is limited on a scheme such as this. However it is noted that the following measures have all been taken as part of the acoustic design process:

- Element 1 – demonstrating a “Good Acoustic Design Process”;
 - The indicative site layout reflects good practice, with a quiet (rear façade) and bedrooms generally oriented to the rear of the houses.
- Element 2 – observing internal “Noise Level Guidelines”;
 - The scheme is new build, and so the external façades, including glazing and ventilators can incorporate acoustic control measures to ensure suitable internal noise levels are met. This is detailed below in Section 7.2.2.
- Element 3 – undertaking an “External Amenity Area Noise Assessment”;
 - The site layout reflects good practice, with gardens generally oriented to the rear of the houses.
- Element 4 – consideration of “Other Relevant Issues”.
 - No other issues

7.2.2 BS 8233:2014 Guidance on sound insulation and noise reduction for buildings

Internal noise levels can be calculated from external noise levels determined in the noise prediction model (as detailed in Section 5), given the size and construction of the building façade elements including glazing and ventilation, as well as acoustic properties of the receiving room, such as the volume and reverberation time. Usually, it is the glazing and, depending upon the particular strategy, the ventilation apertures that admit most noise into residences. It is then a matter of providing façade elements with adequate acoustic performance to achieve sufficient noise reduction to meet the internal noise target.

The method that has been followed is described in Annex G2.1 of *BS 8233:2014 Guidance on sound insulation and noise reduction for buildings*.

The analysis carried out here assumes typical internal finishes for the type of rooms considered, based on acoustic properties Spectrum have measured in a range of occupied dwellings. The general construction of the building envelope is as follows:-



- External walls of brick cladding, with an insulated cavity to 2 layers of 12.5mm plasterboard.
- Window glazing having a specification as described below.
- Tile/slate roof with 12.5mm plasterboard ceiling below and absorbing layer within the void.
- Ventilation to meet the requirements of Part F of the Building Regulations.

Sound insulation data for the façade elements have been taken from sources such as standard data provided by BRE and DETR, Spectrum library of measurement data, calculations using Marshall Day's *Insul* software as well as manufacturer's data and the BRE/CIRIA publication 'Sound Control for Homes'. Based on the internal layout drawings for the proposed dwellings, sample intrusive noise calculations for the most noise-exposed habitable rooms of the development, based on the room and façade dimensions are included in Appendix D. The calculations have been carried out in order to establish the façade glazing and ventilation specification necessary to achieve guideline internal noise levels.

Table 5 below details a sound insulation specification for the proposed dwellings. The numeric sound insulation rating for the glazing and the ventilator openings has been specified in terms of $R_w + C_{tr}$ and $D_{n,e,w} + C_{tr}$ respectively.

Plots	Room	Wall type	Window Performance $R_w + C_{tr}$ dB	Vent Performance $D_{n,e,w} + C_{tr}$ dB
Apartments facing Bancroft	Living Room	Brick/block	32	42
	Dining/Kitchen	Brick/block	32	42
	Bedrooms	Brick/block	38	42
All remaining plots.	Living Room	Brick/block	25	32
	Dining/Kitchen	Brick/block	25	32
	Bedrooms	Brick/block	25	32

Table 5: Sound insulation specification for the proposed development site

Acoustic performances in the habitable rooms of the apartments which would overlook Bancroft can typically be achieved by the following specification.

Living Room/Dining/Kitchen

- Acoustic double-glazed units (rated $R_w + C_{tr}$ 32dB), typically comprising of 10mm float glass, 12mm cavity, 6mm float glass.
- Acoustic trickle ventilators (rated at $D_{n,e,w} + C_{tr}$ 42dB).

Bedrooms

- Acoustic double-glazed units (rated $R_w + C_{tr}$ 38dB), typically comprising of 10mm float glass, 16mm cavity, 9mm float glass.
- Acoustic trickle ventilators (rated at $D_{n,e,w} + C_{tr}$ 42dB).

Acoustic performances in the habitable rooms of all of the remaining plots can typically be achieved by the following specification.

- Standard double-glazed units (rated $R_w + C_{tr}$ 25dB), typically comprising of 4mm float glass, 12mm cavity, 4mm float glass.
- Standard hit and miss trickle ventilators (rated at $D_{n,e,w} + C_{tr}$ 32dB).

Glazing is specified using the weighted sound reduction index, R_w , with a correction applied to account for the acoustic character of road traffic noise, C_{tr} . Vents are specified using the normalised element weighted sound level difference, $D_{n,e,w}$, also corrected for traffic noise, C_{tr} . The acoustic specifications should be met both with and without the traffic noise correction term.

Additionally, the acoustic specification should apply to the window set, as a whole, not just the glazing. For many windows, the influence of the frame materials on the composite sound reduction of the window set is largely negligible. However, for high performance acoustic windows that must achieve R_w 40dB and $R_w + C_{tr}$ 34dB, or more, the influence of the frame becomes increasingly significant and must be taken into account. In these cases, it is recommended that compliance is demonstrated by comparing the results of supplier test data with the required specifications.

7.2.3 Acoustics and overheating

Whether or not an overheating assessment is necessary, or how any potential overheating will be mitigated at this development is for other specialists to determine.

Whether or not the ADO noise thresholds (Section 4.3) are exceeded will depend on the external noise level and how far the window is open. A limit on how far a window can be open while ensuring ADO noise thresholds are met is first determined by the acoustician and this limit can then be shared with the overheating assessor and used as an input in their assessment.

The ventilative performance of an open window is described by a term called the Equivalent Area (EA), as defined in ADO. By contrast, the Acoustic Open Area (AcOA) of an open window is not well defined and depends on several complex interactions between the external sound field and the geometry and type of window. However, emerging empirical evidence suggests that the sound reduction of an open window calculated on the basis of AcOA and EA results in a similar degree of uncertainty. Therefore, limiting values of AcOA can be interpreted by the overheating assessor as limiting values of EA.

ADO provides a simplified method for demonstrating compliance with requirement O1. A number of criteria must be met for compliance, one of which relates to the minimum required free area of openings in bedrooms for ventilative cooling. For bedrooms in locations with a high risk of overheating, the minimum free area must be 13% of the bedroom floor area. In medium risk locations, it must be 4% of the bedroom floor area. If external noise levels result in a free area limit that is lower than the minimum free area required for ventilation, the simplified method fails, and dynamic thermal modelling is required.

This leads to the external compliance limits set out in Table 6.



AcOA as a percentage of floor area (%)	Noise level difference (dB)	Incident noise level limit outside bedroom windows at night for ADO compliance (dB)		Comment
		$L_{Aeq,8hr}$	L_{AFmax}	
1%	15	55	70	Small area may not provide sufficient ventilative cooling. May need mechanical ventilation/cooling.
4%	10	50	65	If levels exceeded in medium risk area, simplified method cannot be used.
13%	5	45	60	If levels exceeded in high risk area, simplified method cannot be used.

Table 6: Maximum allowable acoustic open area of window for compliance with ADO noise thresholds

In this case therefore:

- Red Zone (See drawing in Appendix D) – ADO internal noise limits will not be achieved if windows are open at night, and so cooling will need to be provided by other means
- Orange Zone (See drawing in Appendix D) – ADO internal noise limits will be achieved if the AcOA of windows in this zone does not exceed 4% of the bedroom's floor area

This can be used by the overheating assessor when considering compliance with appropriate regulations and guidance.

7.2.4 Noise levels in outdoor living spaces

BS 8233:2014 suggests the following guidelines for noise levels in external spaces that are used for amenity space, such as gardens and patios. *“For traditional external areas that are used for amenity space, such as gardens and patios, it is desirable that the external noise level does not exceed 50 dB $L_{Aeq,T}$, with an upper 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.”*

The site by definition adjoins the strategic road network. Consequently, the residential scheme has been designed to achieve the lowest practicable noise levels in the outside amenity areas of properties.

Noise levels in each of the gardens have been calculated from the predicted external noise levels, taking into account the size and construction of the surrounding barrier fences, as well as the houses themselves. Following construction of the scheme, noise levels in the gardens during the daytime would not exceed the $L_{Aeq,16hour}$ 55dB guideline suggested by BS 8233:2014 at all of the plots.

8. CONCLUSIONS

Selumi Investments Ltd & Holt End House Investments Ltd. are seeking planning permission for a mixed-use development at 18-19 Bancroft in Hitchin, Hertfordshire.

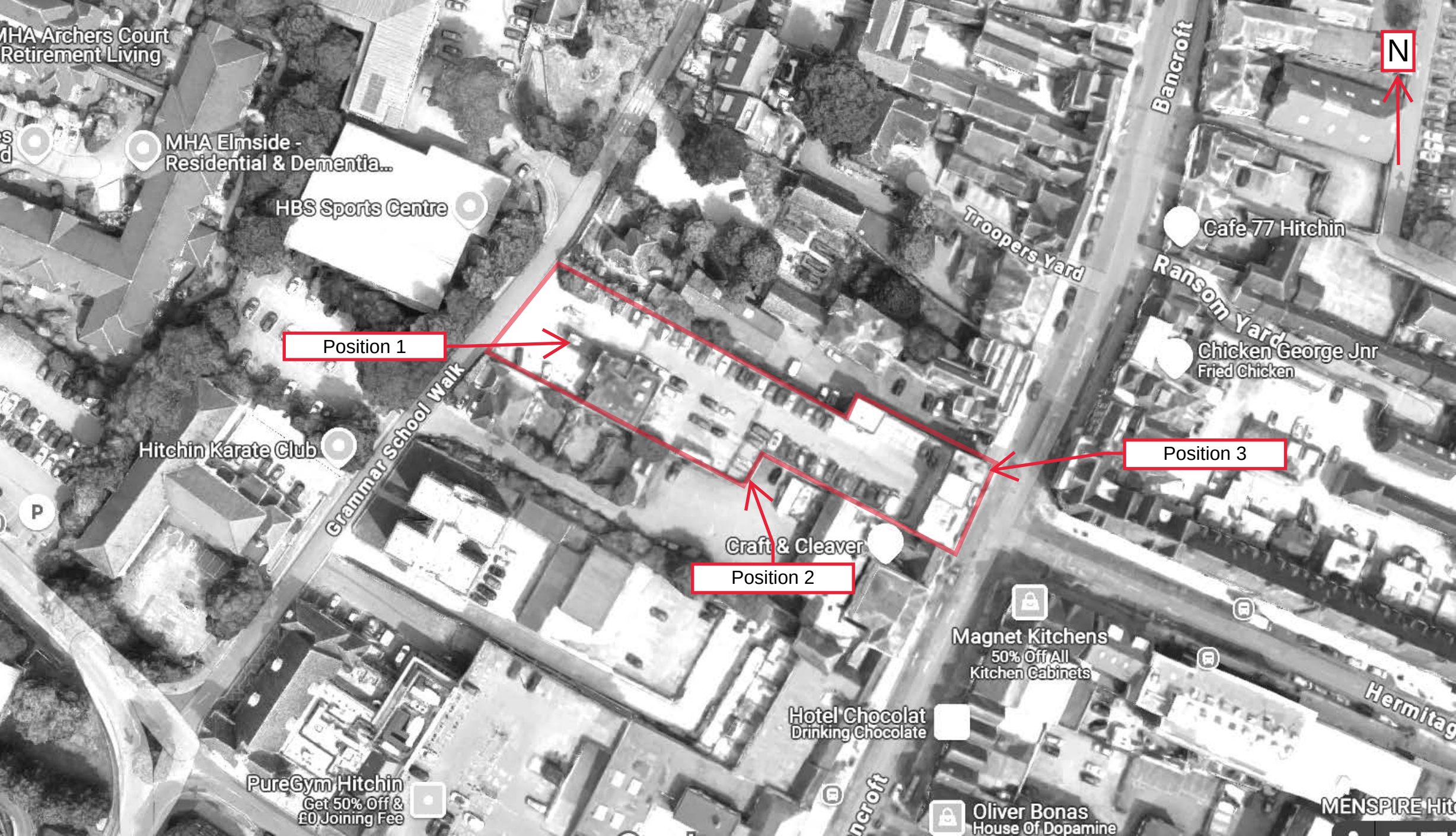
Spectrum Acoustic Consultants has been instructed to carry out a noise impact assessment to submit to the Local Planning Authority as part of the planning application.

A noise survey on the site has been completed, and the data from the survey has been used to inform a noise mitigation strategy.

- Acoustic insulation for the façade to control noise ingress has been assessed, and acoustic performance specifications set for the windows in keeping with guidelines set out in BS 8233 and WHO Guidelines for Community Noise.
- The garden areas have been developed to ensure noise is reduced to lowest practicable/acceptable levels for external amenity in outdoor living spaces, in accordance with BS 8233.
- Noise limits for the control of mechanical plant noise associated with the proposed commercial units have been set. These limits are based on the guidance contained within BS 4142. These limits could form part of a planning condition.
- Noise constraints on the use of open windows as mitigation for overheating has also been reviewed for the purpose of informing any subsequent overheating assessment.

APPENDIX A

Site Location Plans



MHA Archers Court
Retirement Living

MHA Elmside -
Residential & Dementia...

HBS Sports Centre

Position 1

Hitchin Karate Club

Grammar School Walk

Craft & Cleaver

Position 2

Magnet Kitchens
50% Off All
Kitchen Cabinets

Hotel Chocolat
Drinking Chocolate

PureGym Hitchin
Get 50% Off &
£0 Joining Fee

Oliver Bonas
House Of Dopamine

Cafe 77 Hitchin

Ransom Yard

Chicken George Jnr
Fried Chicken

Position 3

Hermitage

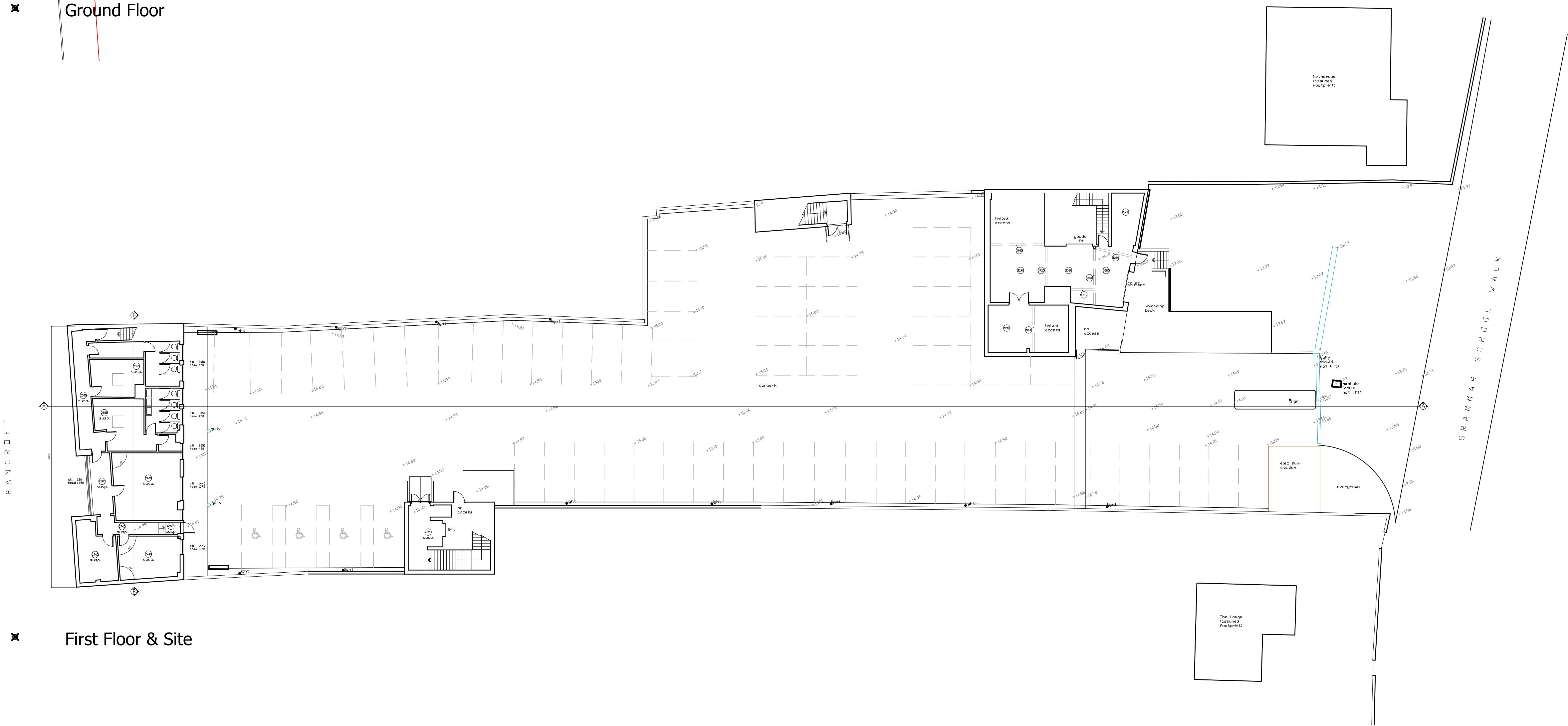
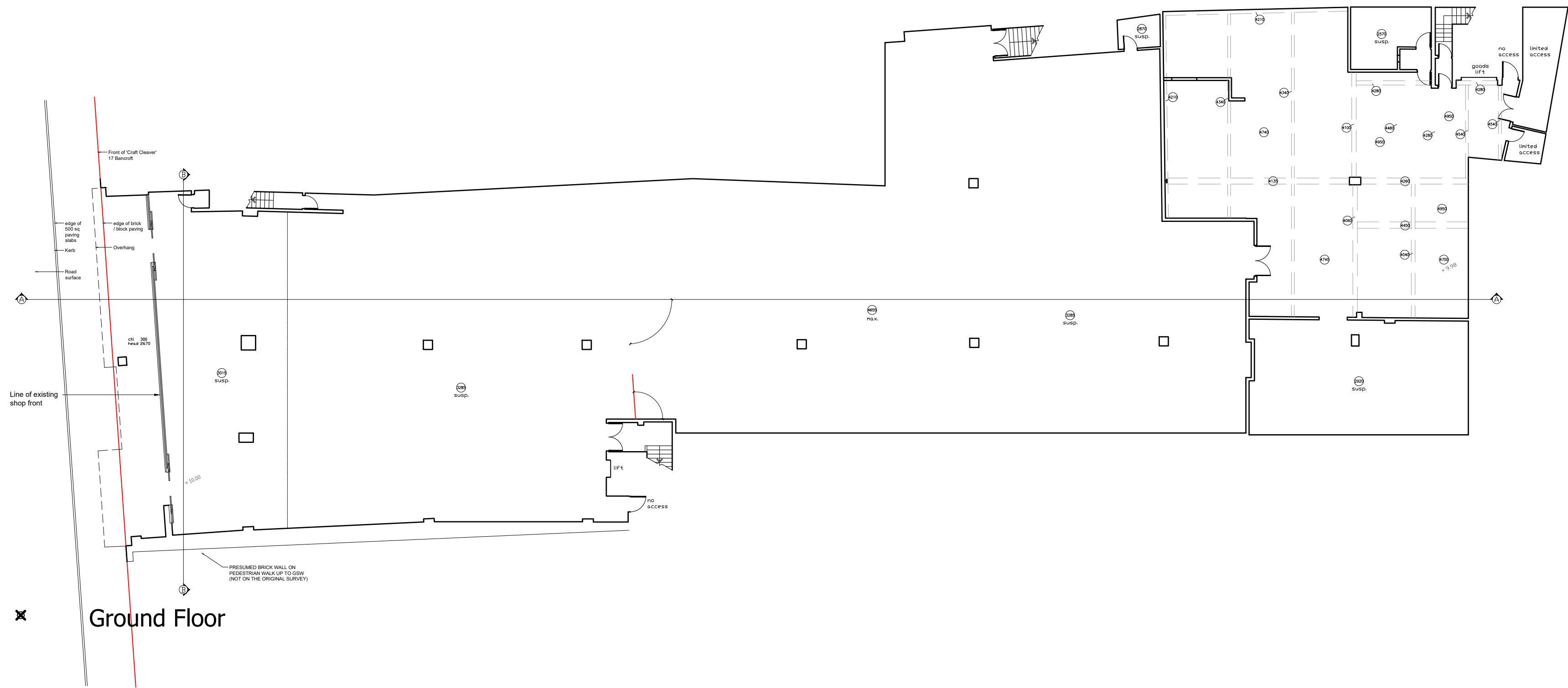
MENSPIRE HIT

N



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Further and/or final proposals must be based upon a
fully measured building survey and not this drawing.



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Client:

Owners of Hitchin

Project:

Redevelopment of
18 - 19 Bancroft,
Hitchin

Drawing
Title:

EXISTING SITE SURVEY
(By Ross Laird)

Dwg no.

001

Drawn:

AM

Date:

JAN 2025

Checked:

CE

Scale:

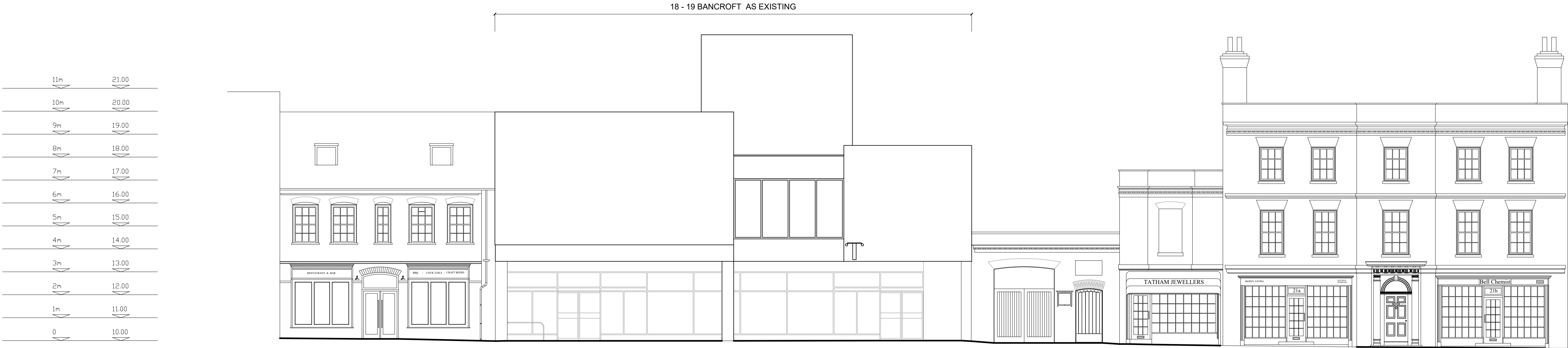
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Revisions:

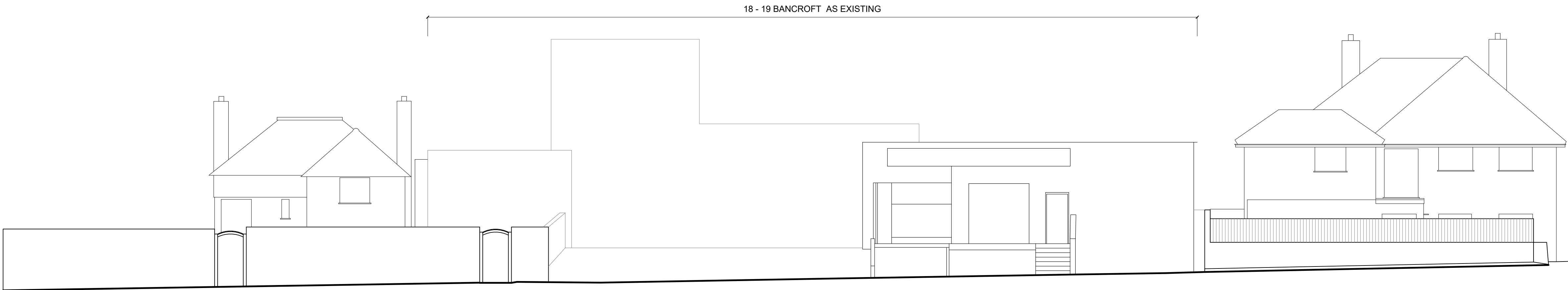
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Existing Street Scene of 18 - 19 Bancroft showing neighbouring buildings



Existing Street Scene from Grammar School Walk showing neighbouring buildings

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Owners of Hitchin

Project:

Redevelopment of
18 - 19 Bancroft,
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Drawing
Title:

EXISTING STREET
SCENES (By Ross Laird)

Dwg no.

002

Drawn:

AM

Date:

JAN 2025

Checked:

CE

Scale:

1:100 @ A1

Revisions:

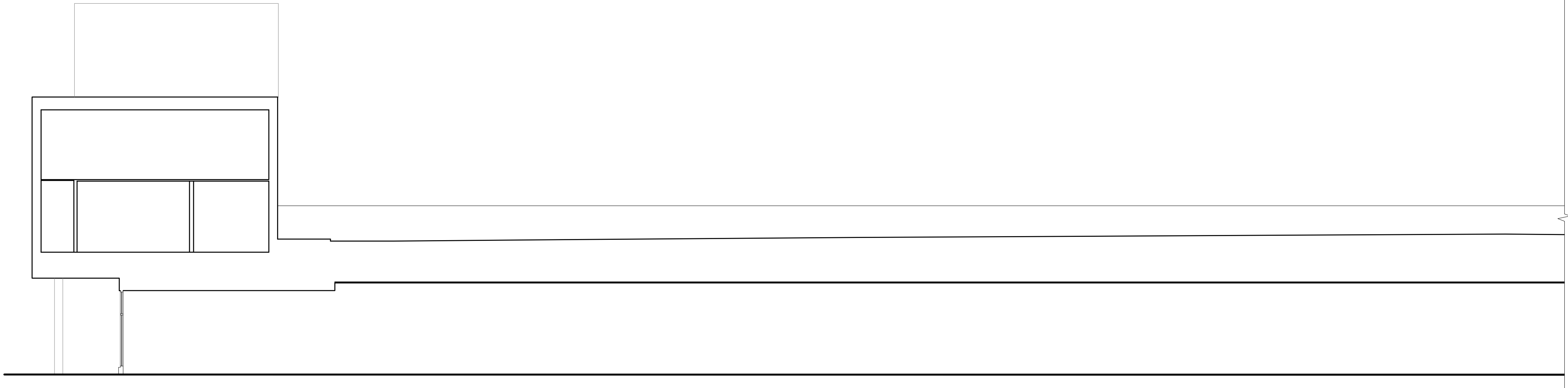
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10m	20.00
9m	19.00
8m	18.00
7m	17.00
6m	16.00
5m	15.00
4m	14.00
3m	13.00
2m	12.00
1m	11.00
0	10.00

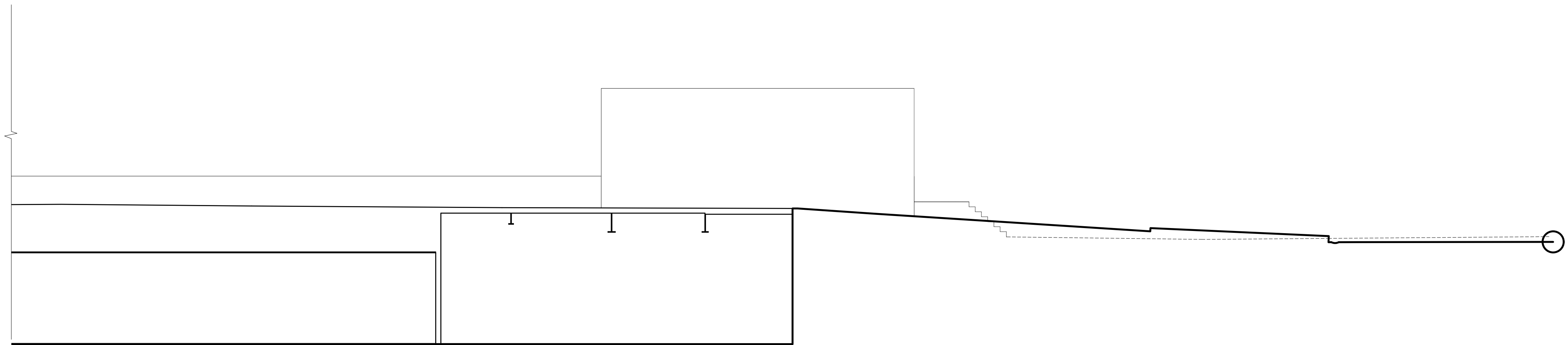
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14.39

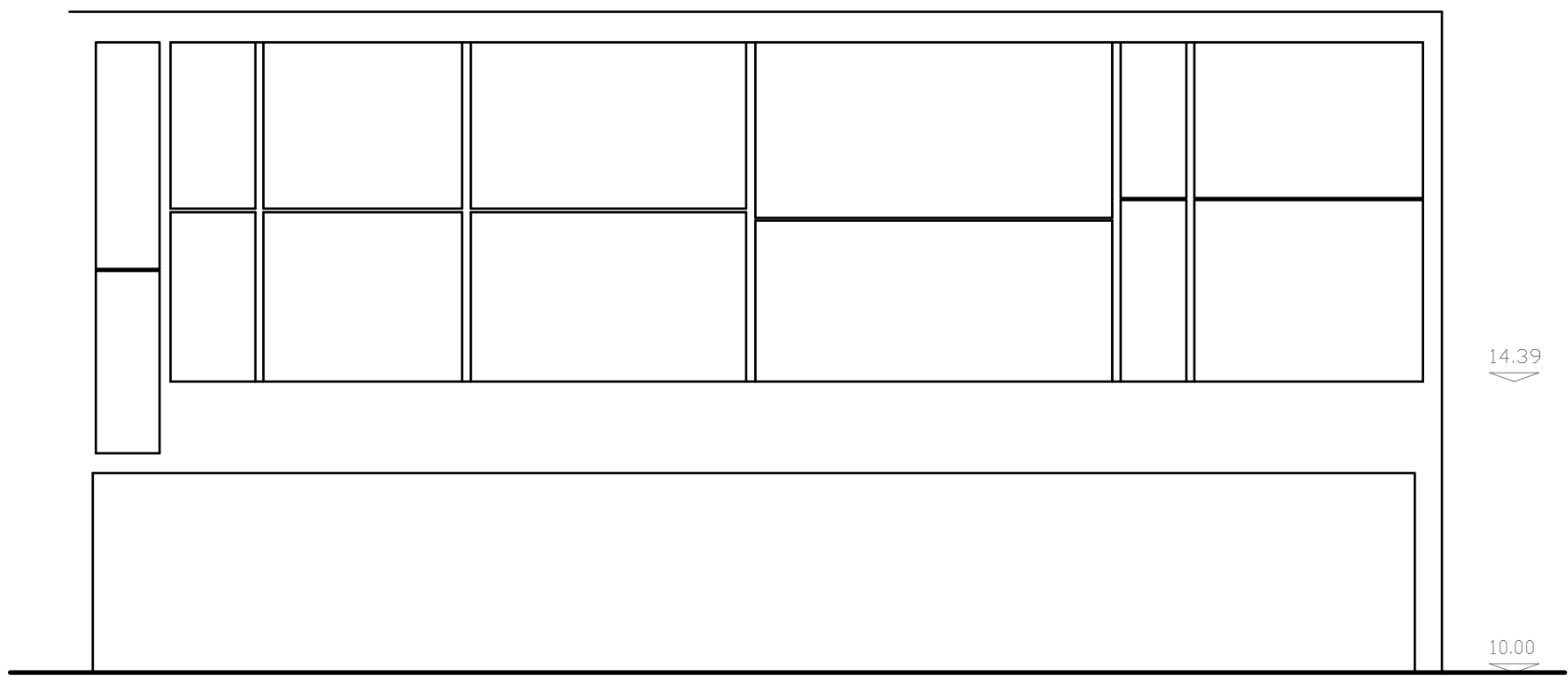
10.00



SECTION A-A - Poundland with Parking above



SECTION A-A (continued) - Poundland with Parking above



SECTION B-B - Poundland with Offices above

0m 1m 2m 3m 4m 5m
Scale 1:100

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Client: **Owners of Hitchin**

Project: **Redevelopment of
18 - 19 Bancroft,
Hitchin**

Drawing
Title: **EXISTING SITE SECTIONS
(By Ross Laird)**

Dwg no. **003**

Drawn: **AM** Date: **JAN 2025** Checked: **CE**

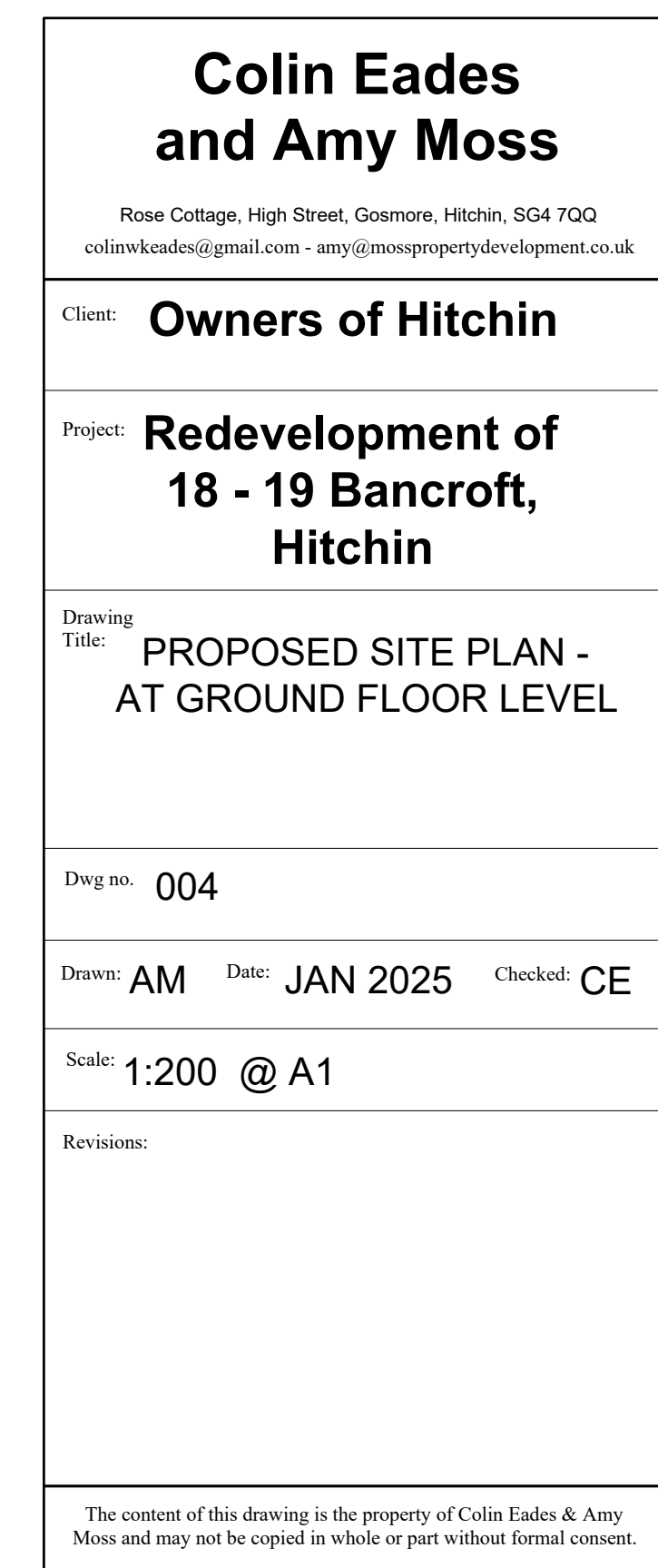
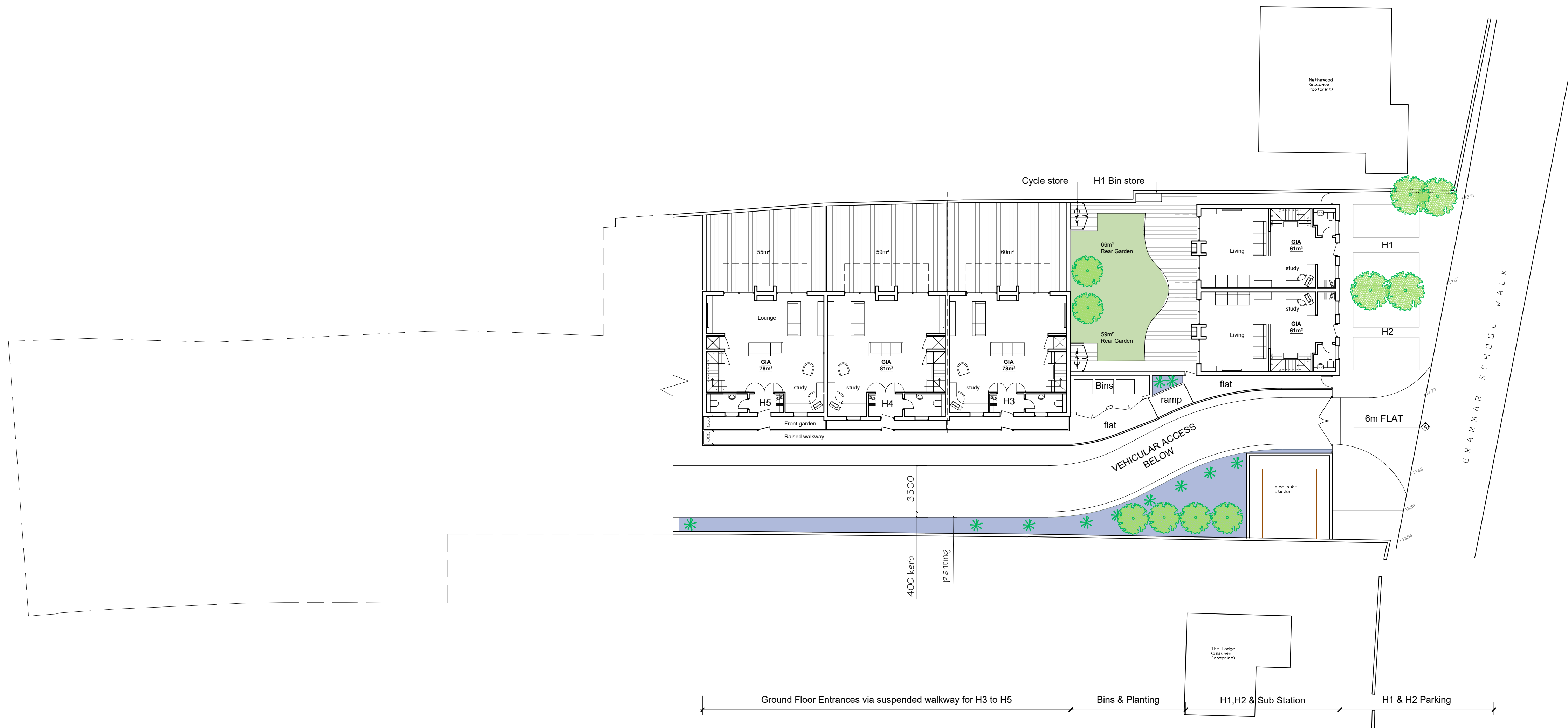
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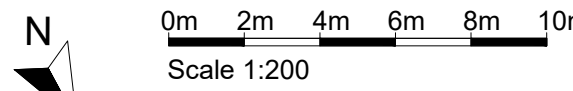
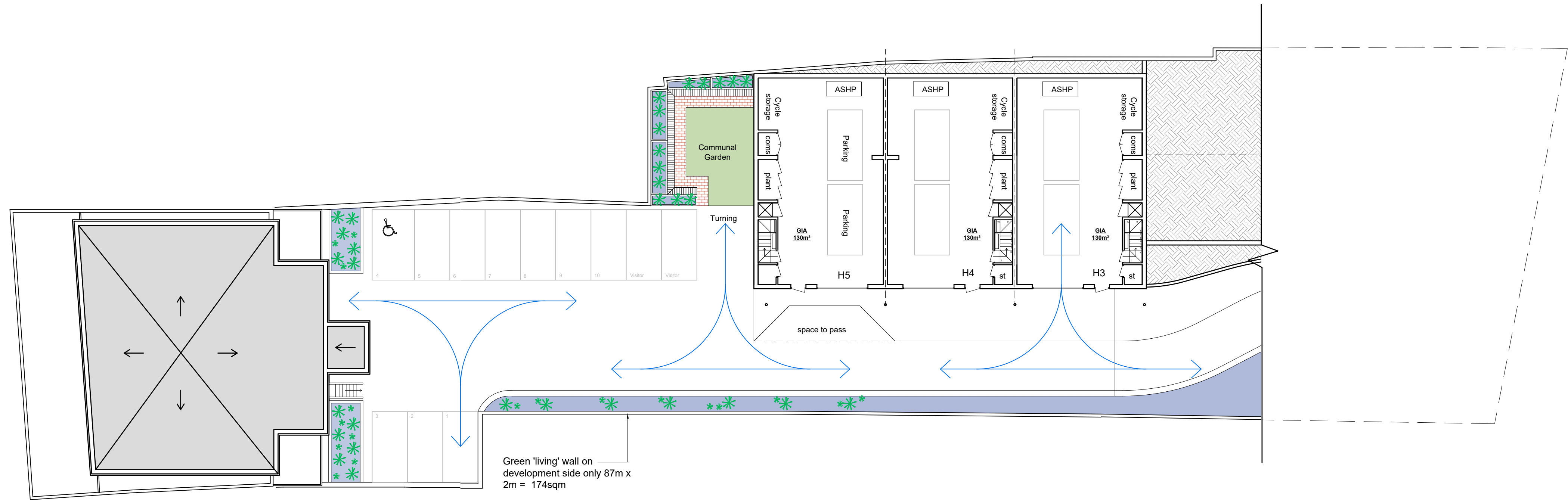
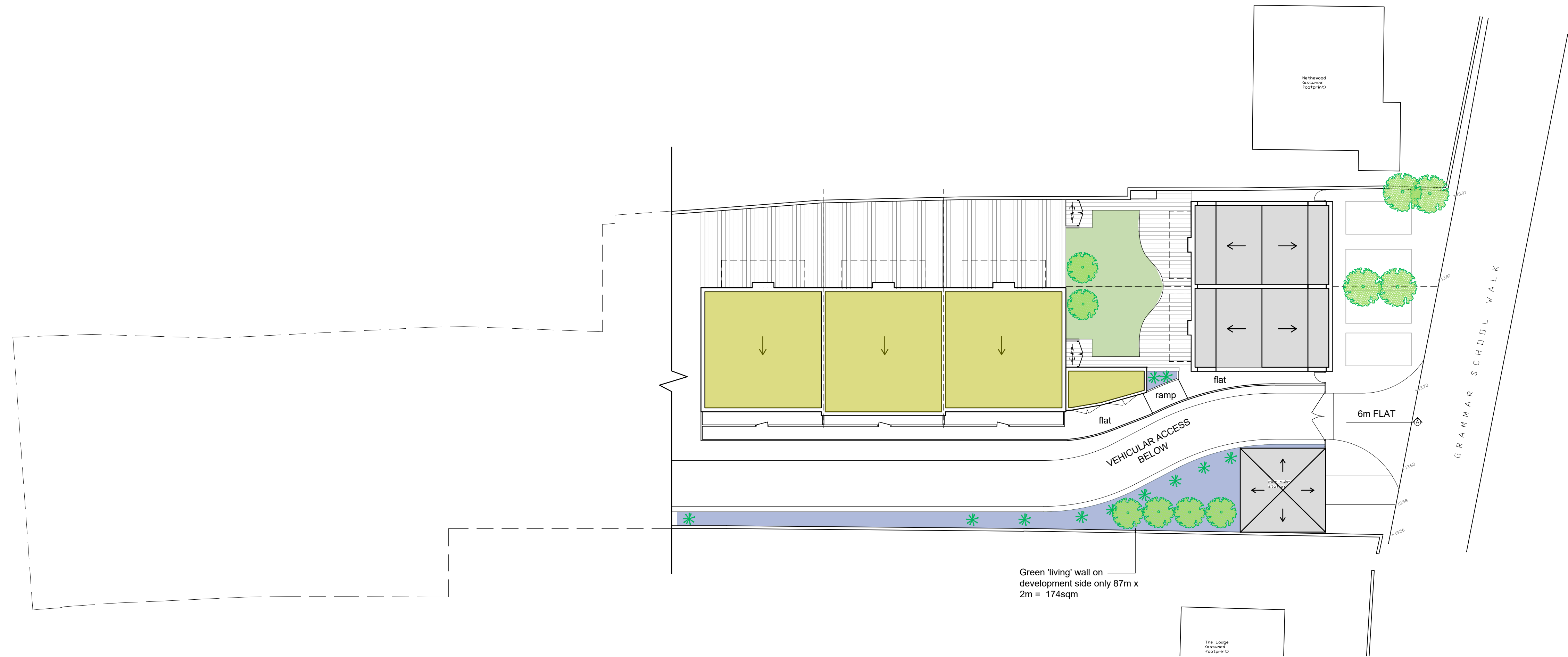
Revisions:

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A P P E N D I X B

Proposed Scheme Drawings





Areas for Biodiversity net gain metric	
All numbers are m²	
Buildings:	
18- 19 Bancroft + Cycle storage	364
H3-5	423
H1&2	140
Sub station	42
Bin stores	20
Planters & walls	19
	21
	13
	13
Hard Landscaping:	
Drives (bonded & porous)	719
Paths	310
Decking / paving	12
	61
Soft Landscaping:	
Lawns	33
	33
	30
Sedum	78
	78
	81
	13
	2
Wild	53
	56
	10
	12

Landscaping Legend:	
Lawn	
Wild Planting	
Sedum Roof	
Proposed native specimen trees - 10no.	

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Client: **Owners of Hitchin**

Project: **Redevelopment of 18 - 19 Bancroft, Hitchin**

Drawing Title: **PROPOSED SITE ROOF PLAN & LANDSCAPING**

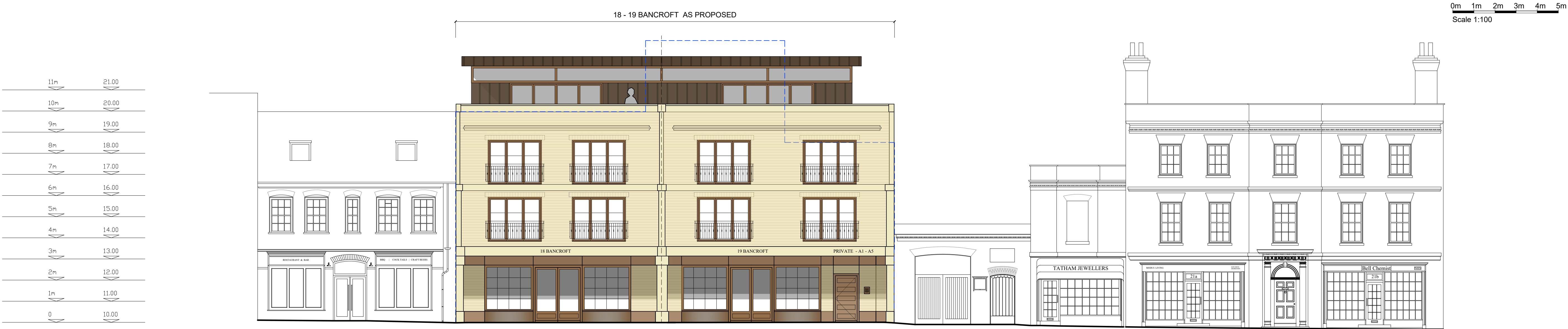
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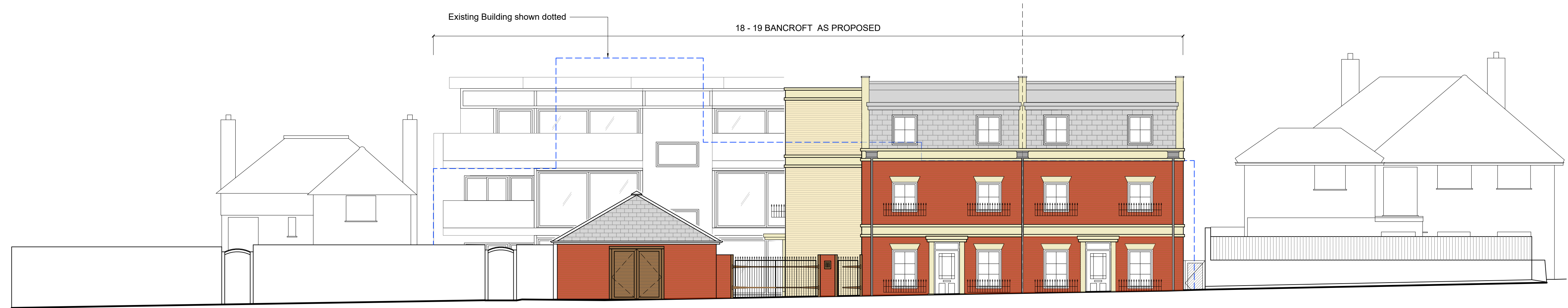
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Revisions:

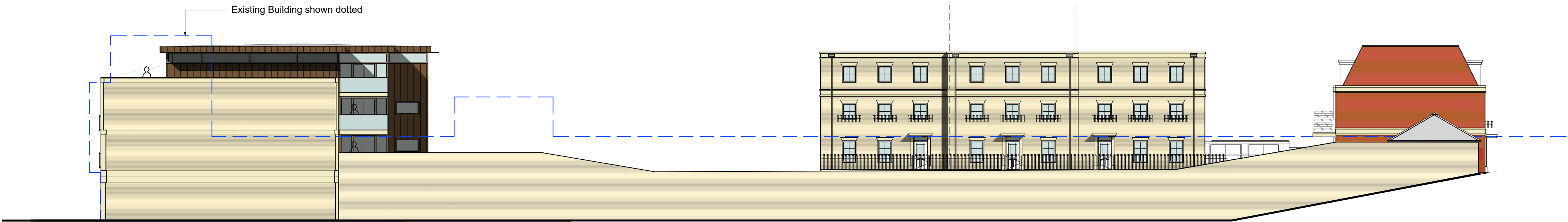
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Proposed Street Scene of 18 - 19 Bancroft showing neighbouring buildings



Proposed Street Scene of Grammar School Walk showing neighbouring buildings



Proposed Elevation visible from the pedestrian route from Bancroft up to Grammar School Walk (Neighbouring levels assumed)

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Project:

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18 - 19 Bancroft,
Hitchin

Drawing
Title:

PROPOSED STREET
SCENES

Dwg no.

006

Drawn:

AM

Date:

JAN 2025

Checked:

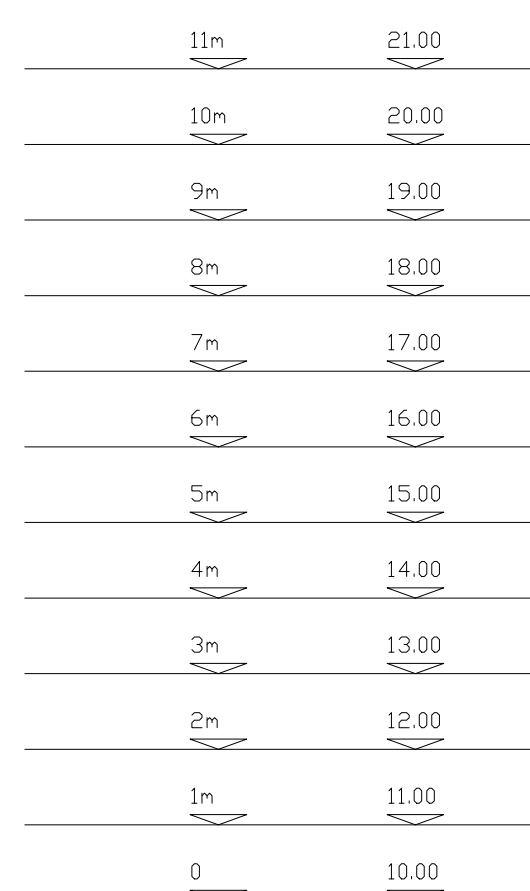
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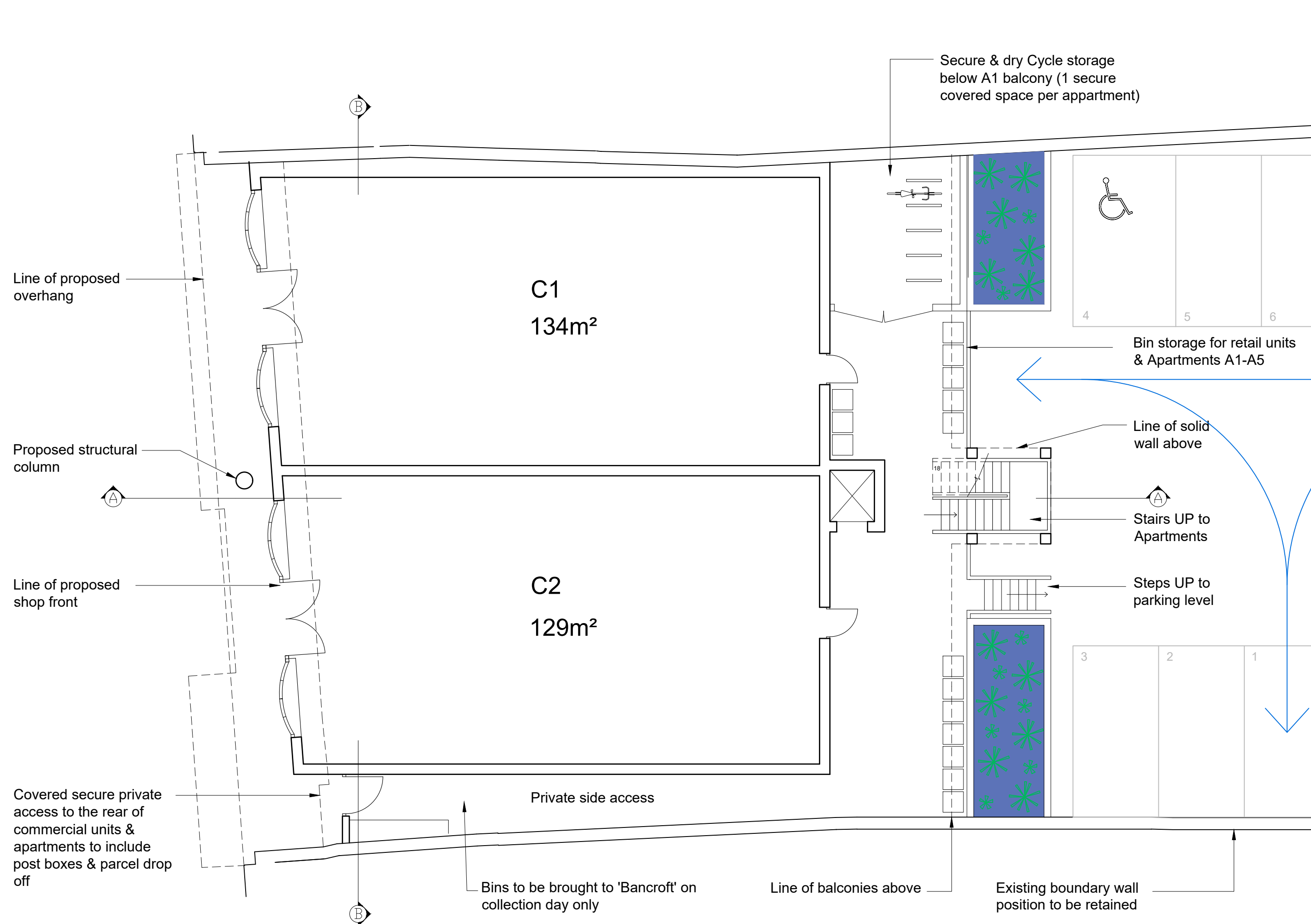
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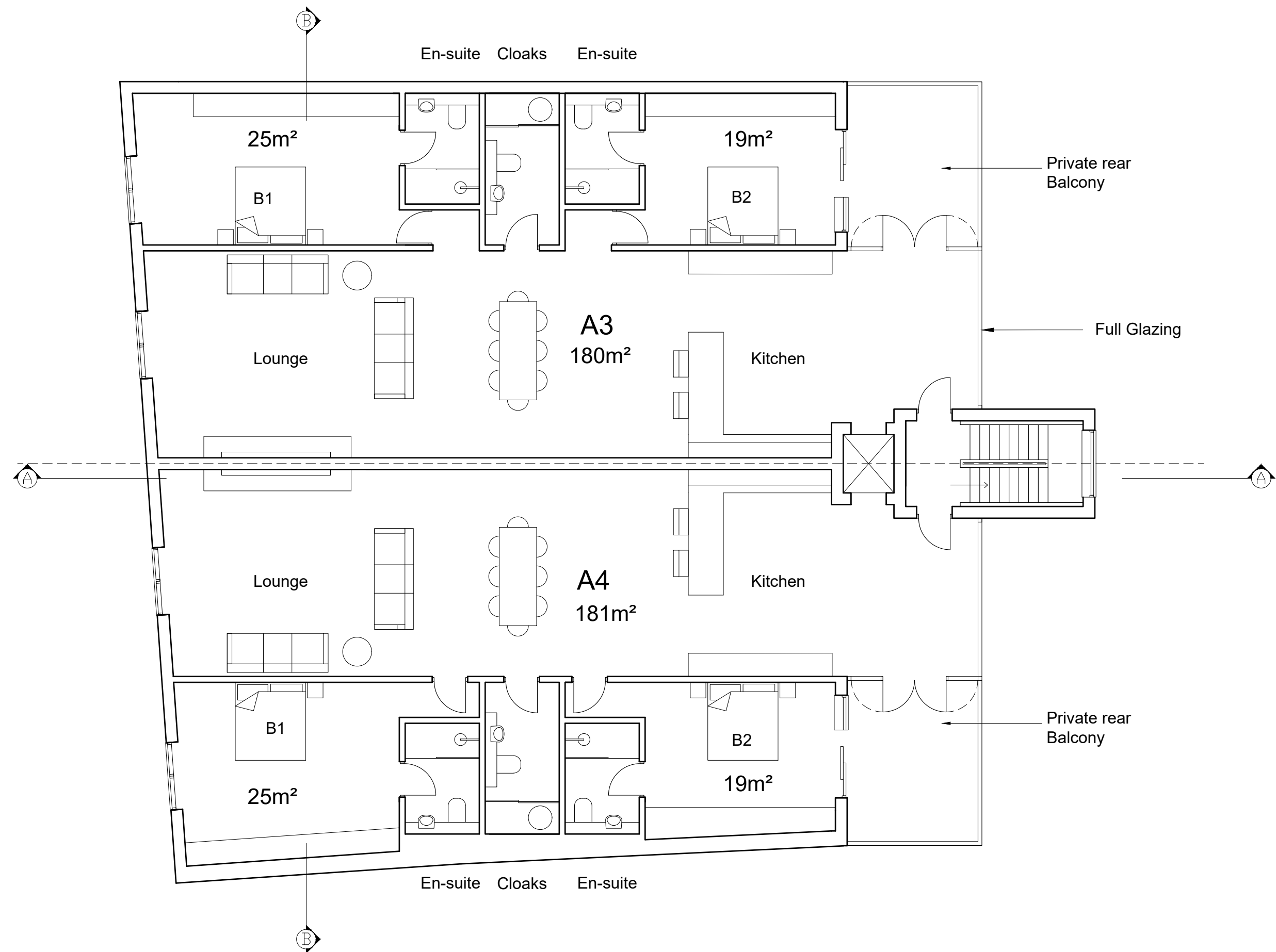
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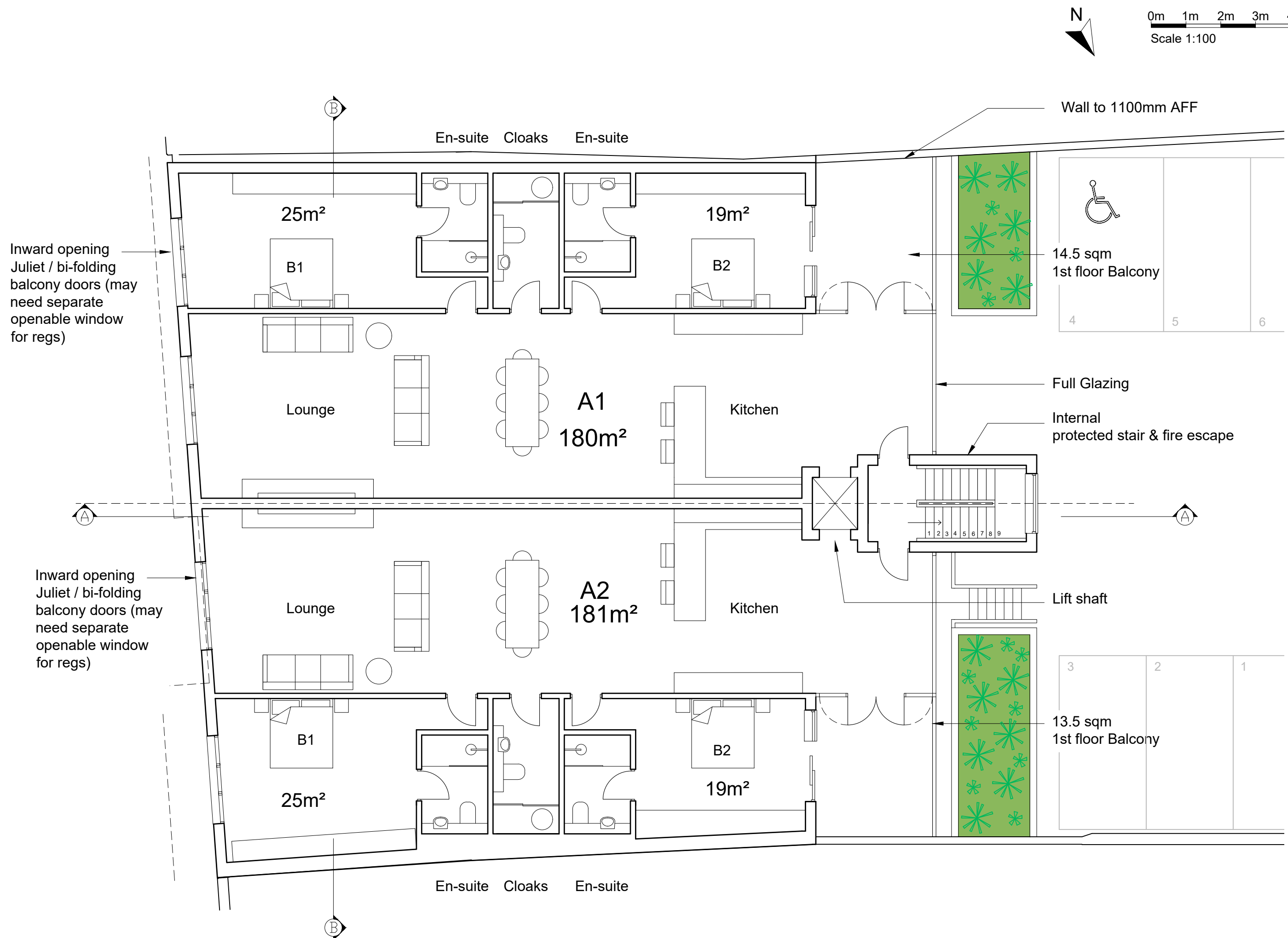
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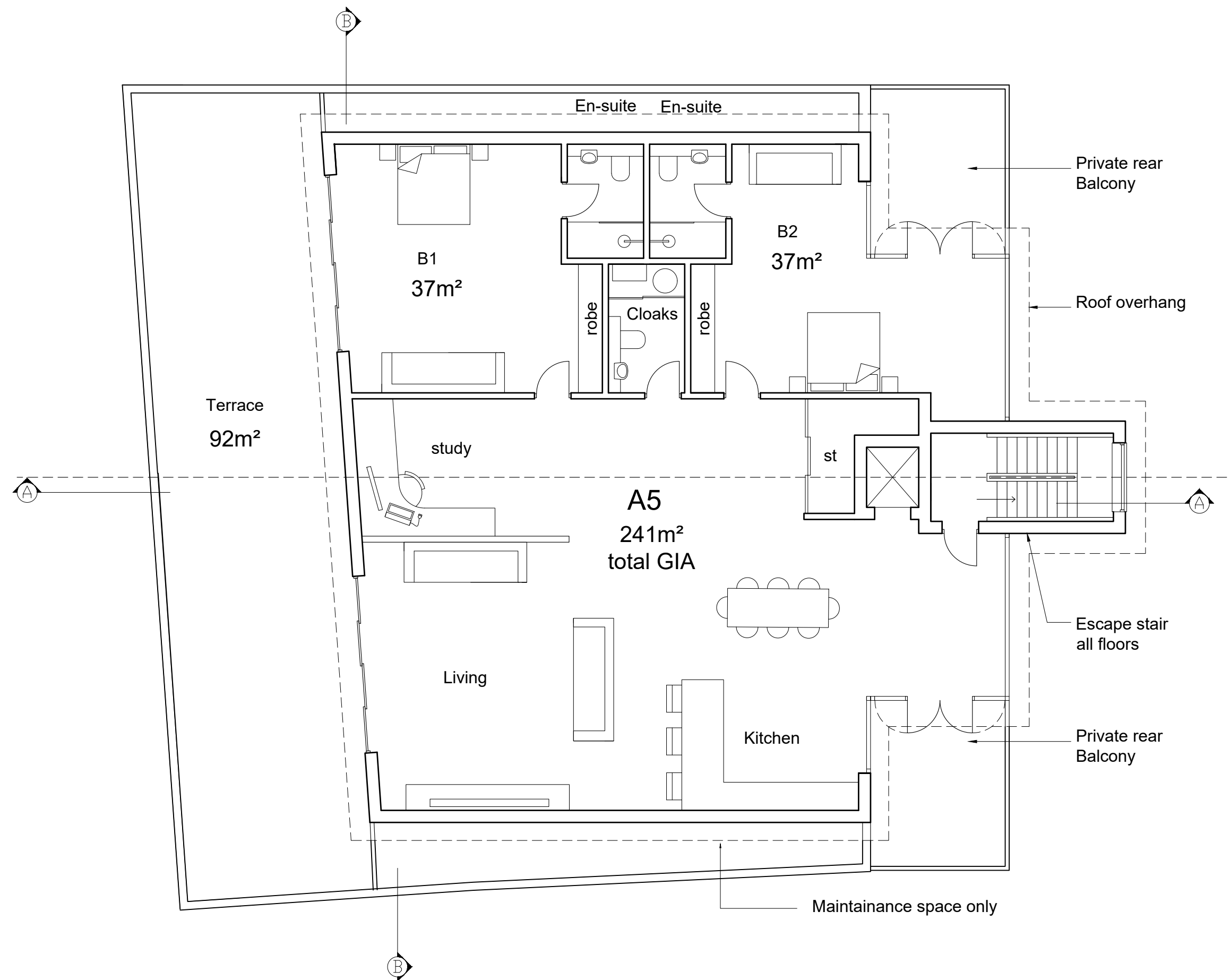
Bancroft Level - Commercial



Second Floor - Residential



First Floor - Residential



Third Floor - Residential

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Project: **Redevelopment of
18 - 19 Bancroft,
Hitchin**

Drawing
Title: **PROPOSED PLANS
C1 & C2, A1 - A5**

Dwg no. **008**

Drawn: **AM** Date: **JAN 2025** Checked: **CE**

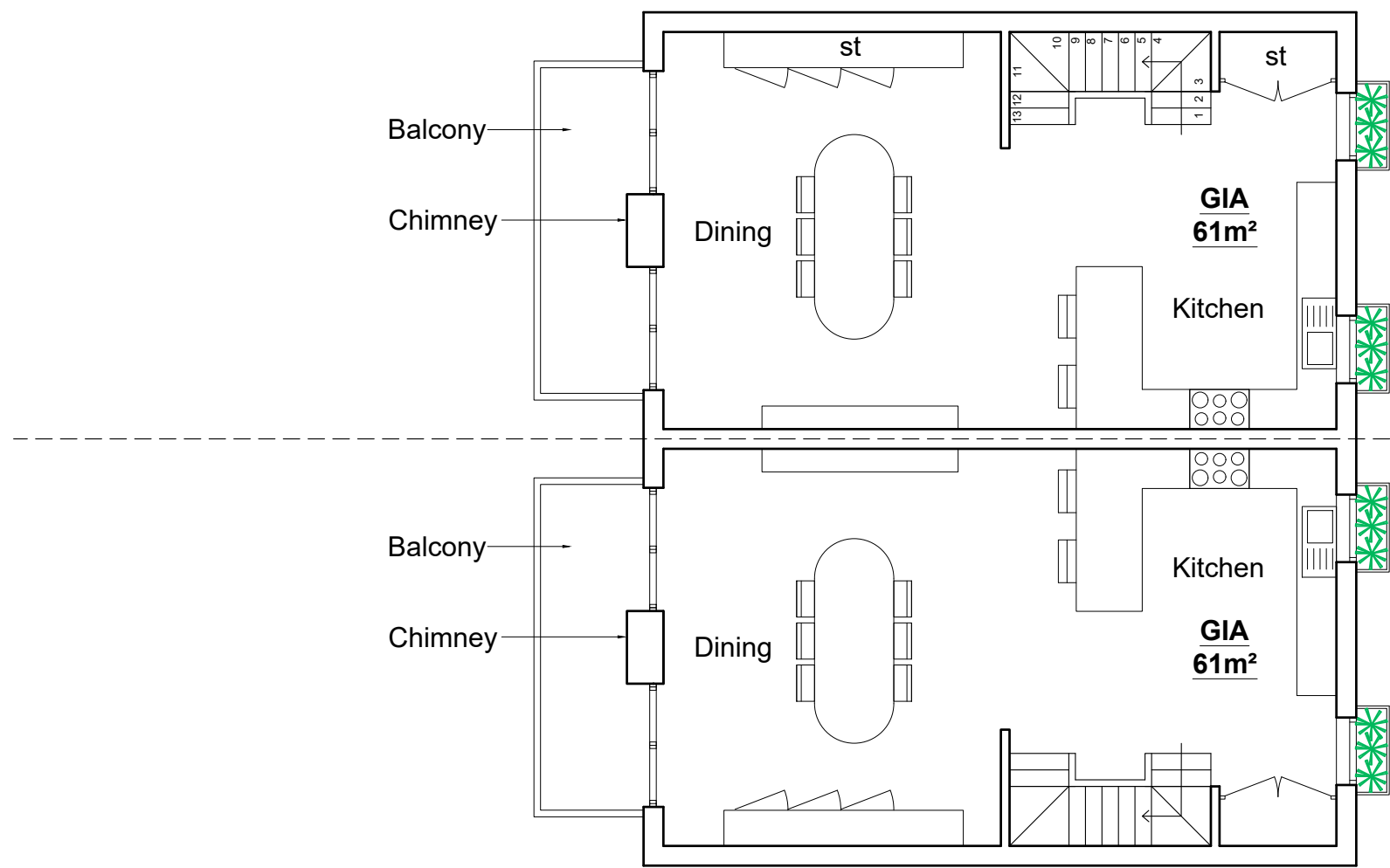
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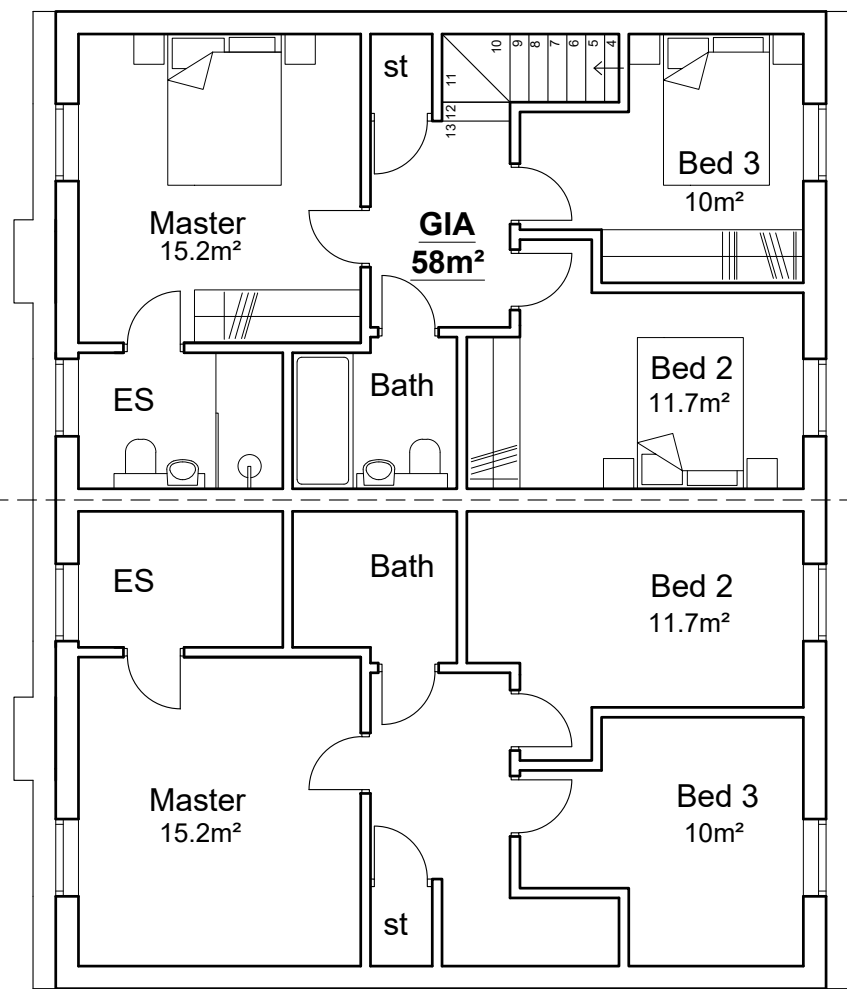
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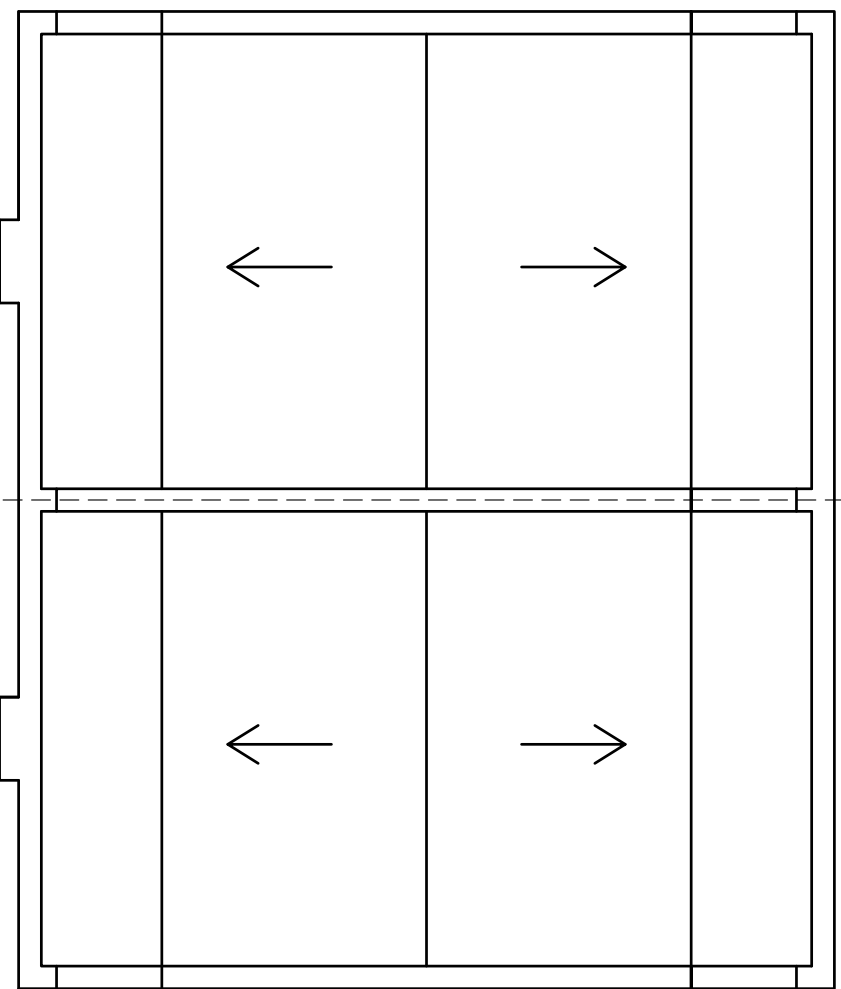
H1 & H2 - Ground Floor



H1 & H2 - First Floor



H1 & H2 - Second Floor

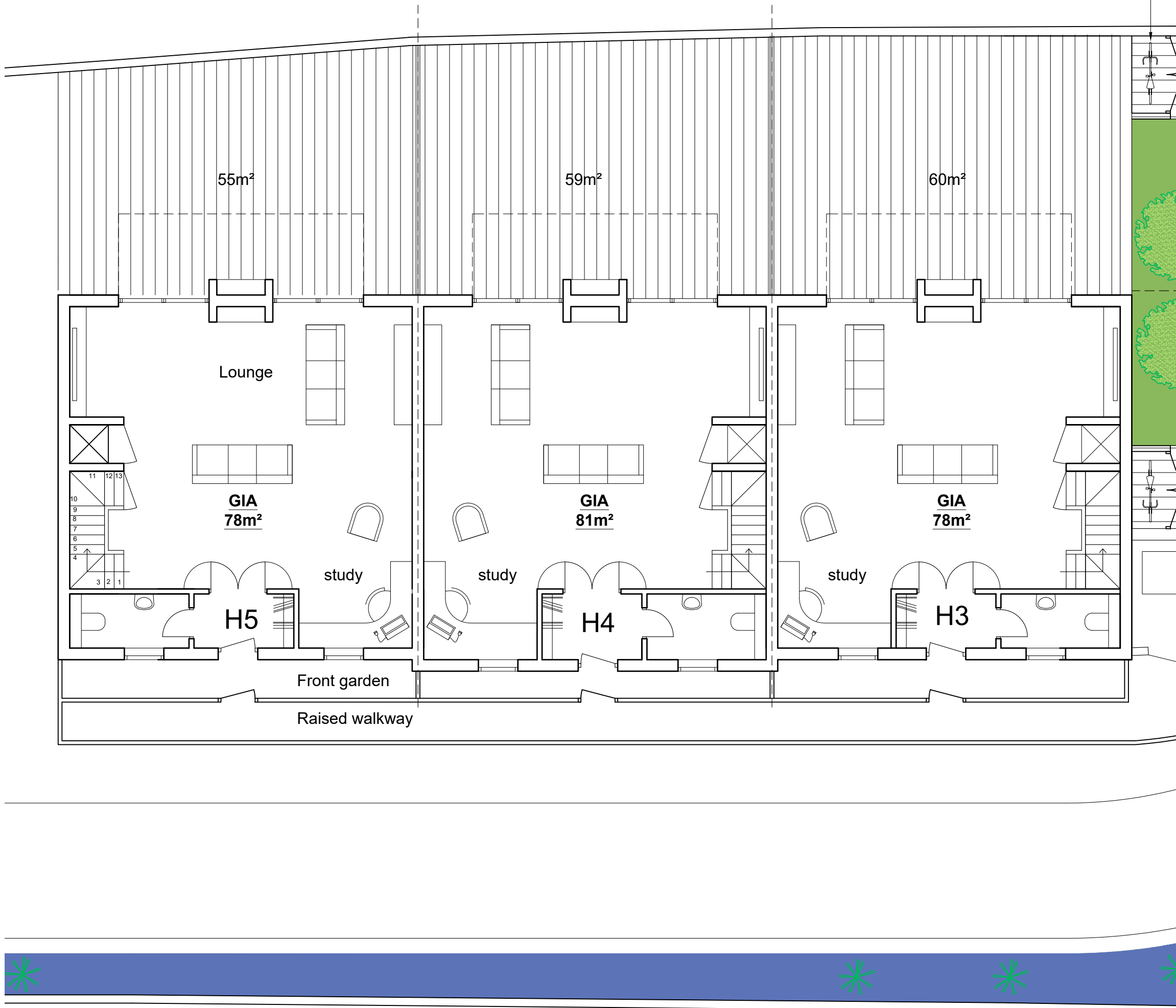


H1 & H2 - Roof Plan

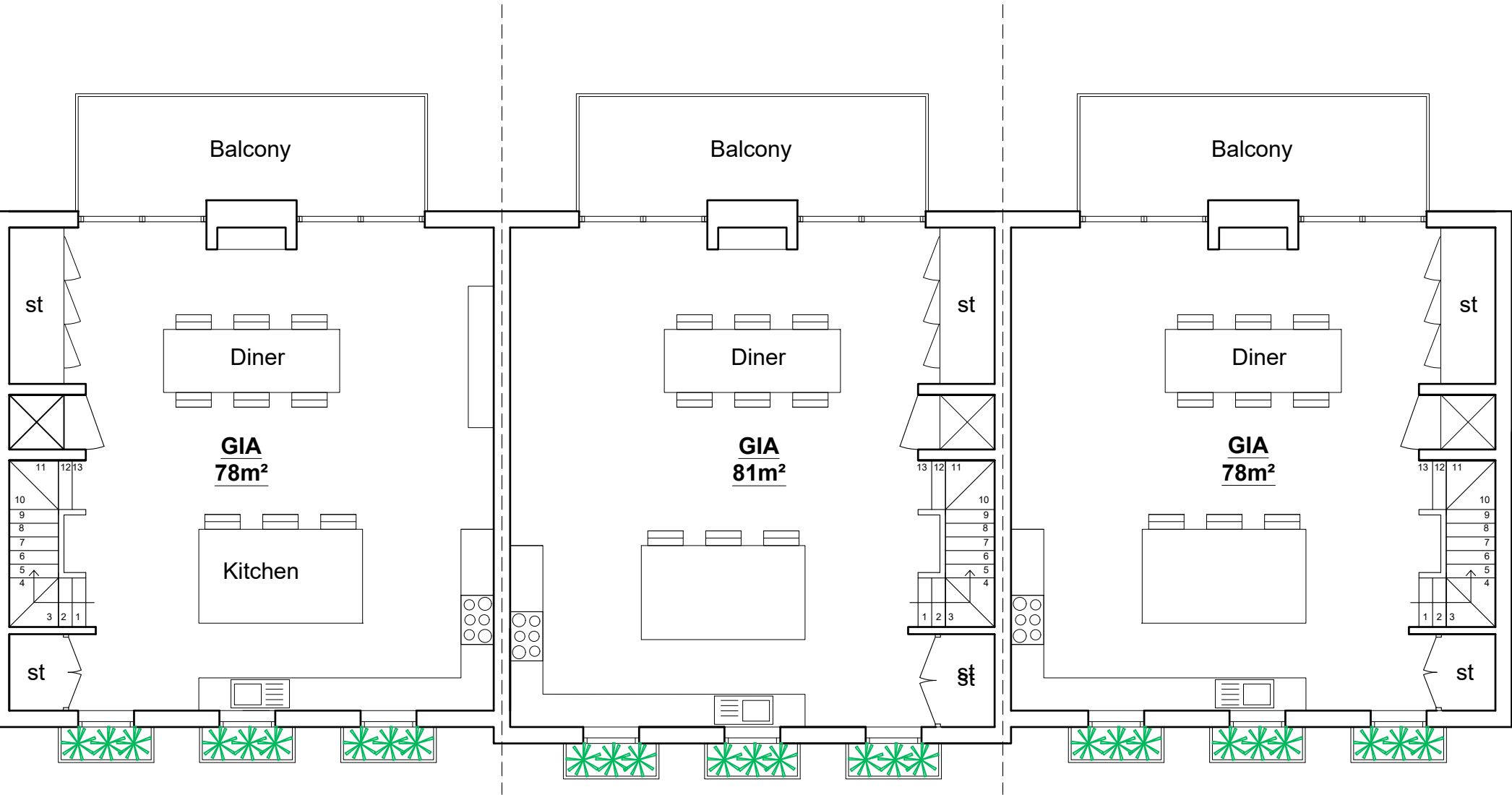
Colin Eades and Amy Moss Rose Cottage, High Street, Gosmore, Hitchin, SG4 7QQ colinwkeades@gmail.com - amy@mosspropertydevelopment.co.uk		
Client:	Owners of Hitchin	
Project:	Redevelopment of 18 - 19 Bancroft, Hitchin	
Drawing Title:	PROPOSED PLANS H1 & H2	
Dwg no.	009	
Drawn:	AM	Date: JAN 2025 Checked: CE
Scale:		
Revisions:	1:100 @ A1	
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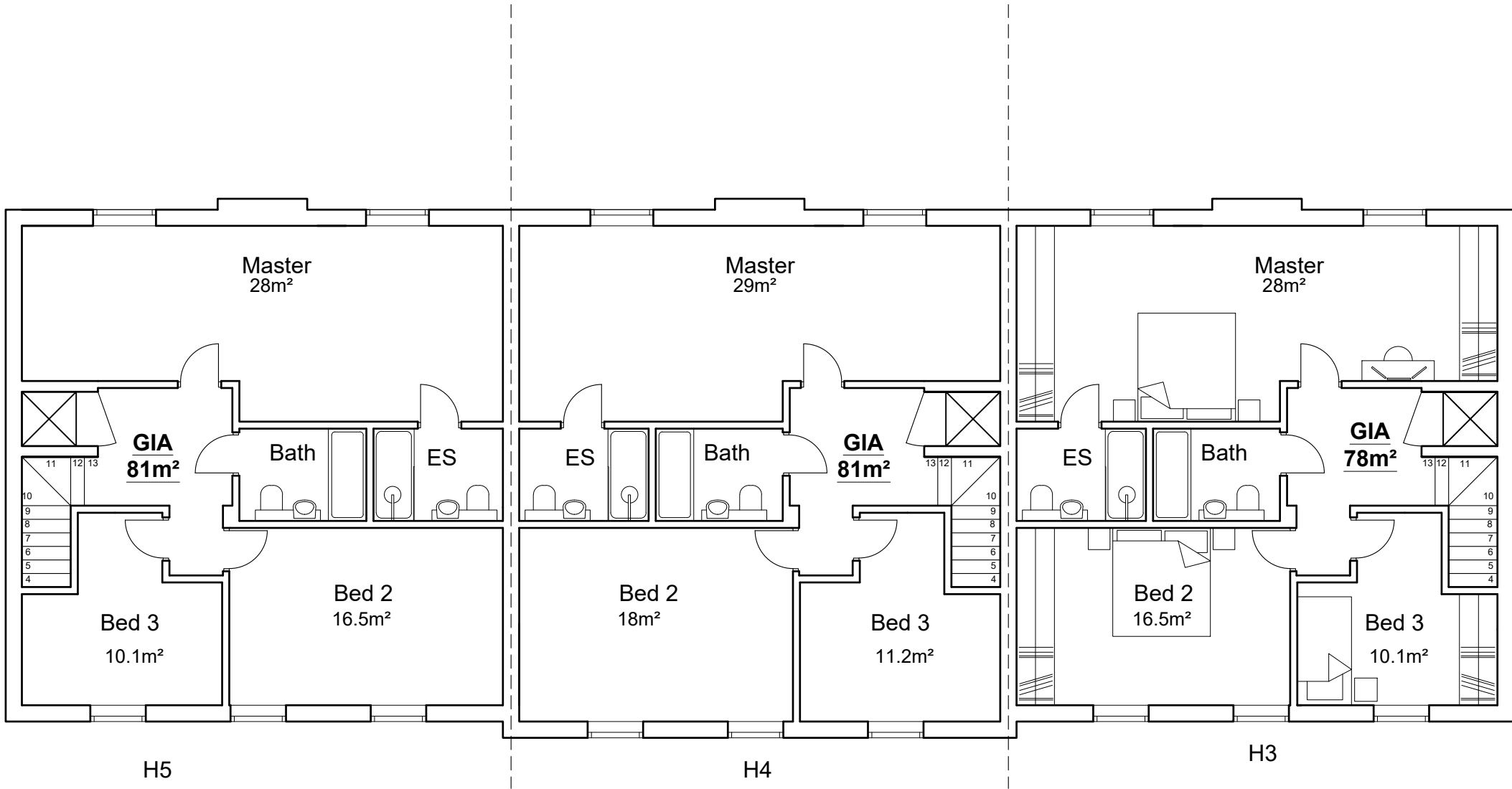
H3, H4 & H5 - Basement Level



H3, H4 & H5 - Ground Floor

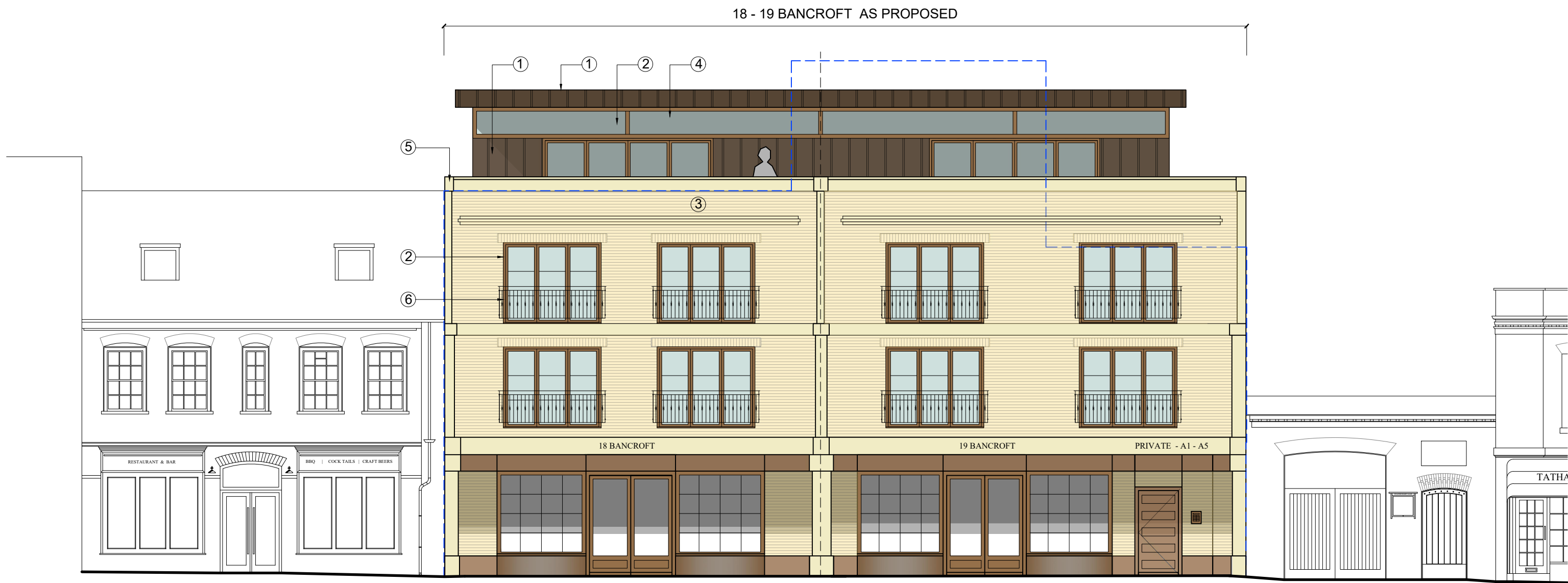


H3, H4 & H5 - First Floor

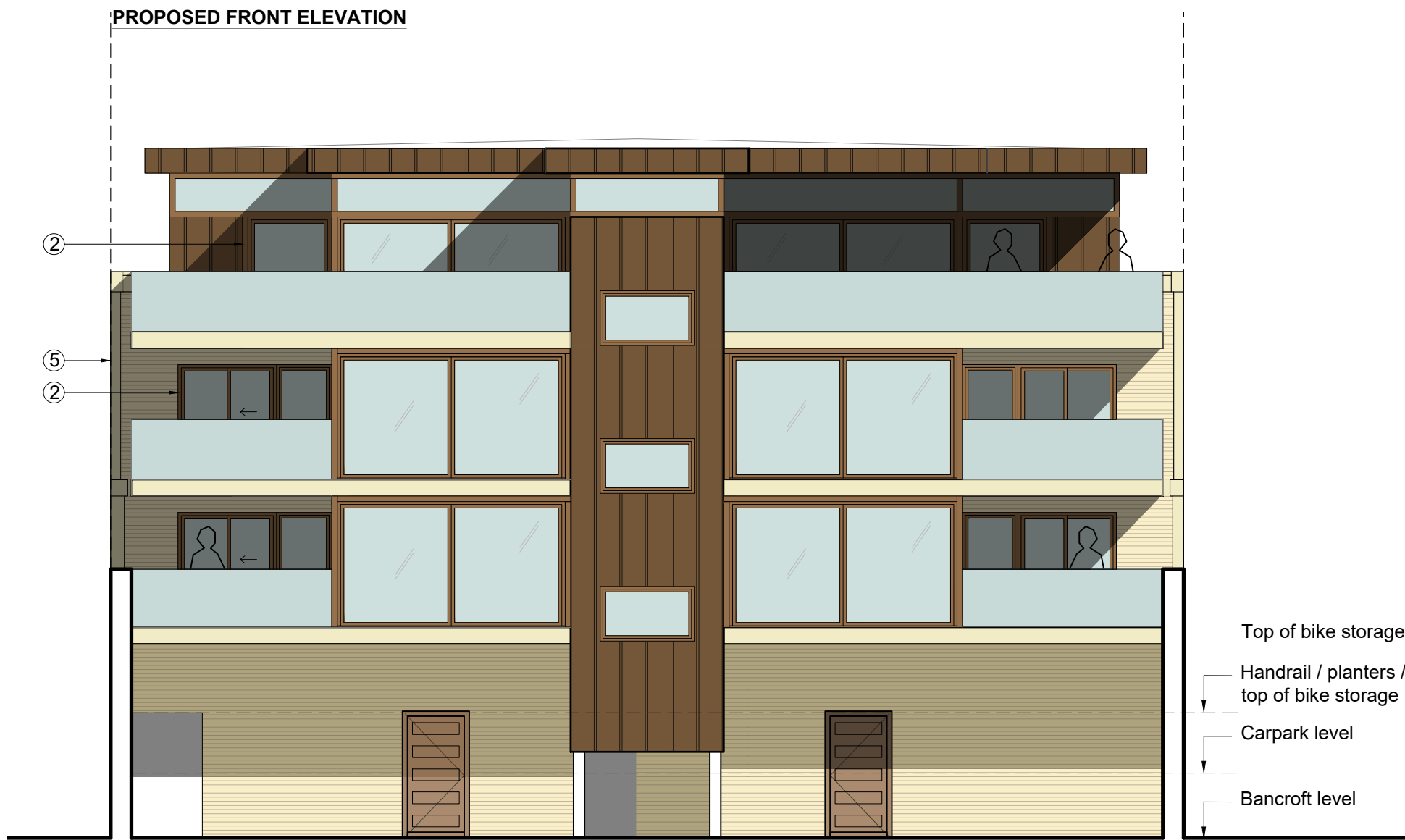


H3, H4 & H5 - Second Floor

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Client:	Owners of Hitchin	
Project:	Redevelopment of 18 - 19 Bancroft, Hitchin	
Drawing Title:	PROPOSED PLANS H3 - H5	
Dwg no.	010	
Drawn:	AM	Date: JAN 2025 Checked: CE
Scale:	1:100 @ A1	
Revisions:		
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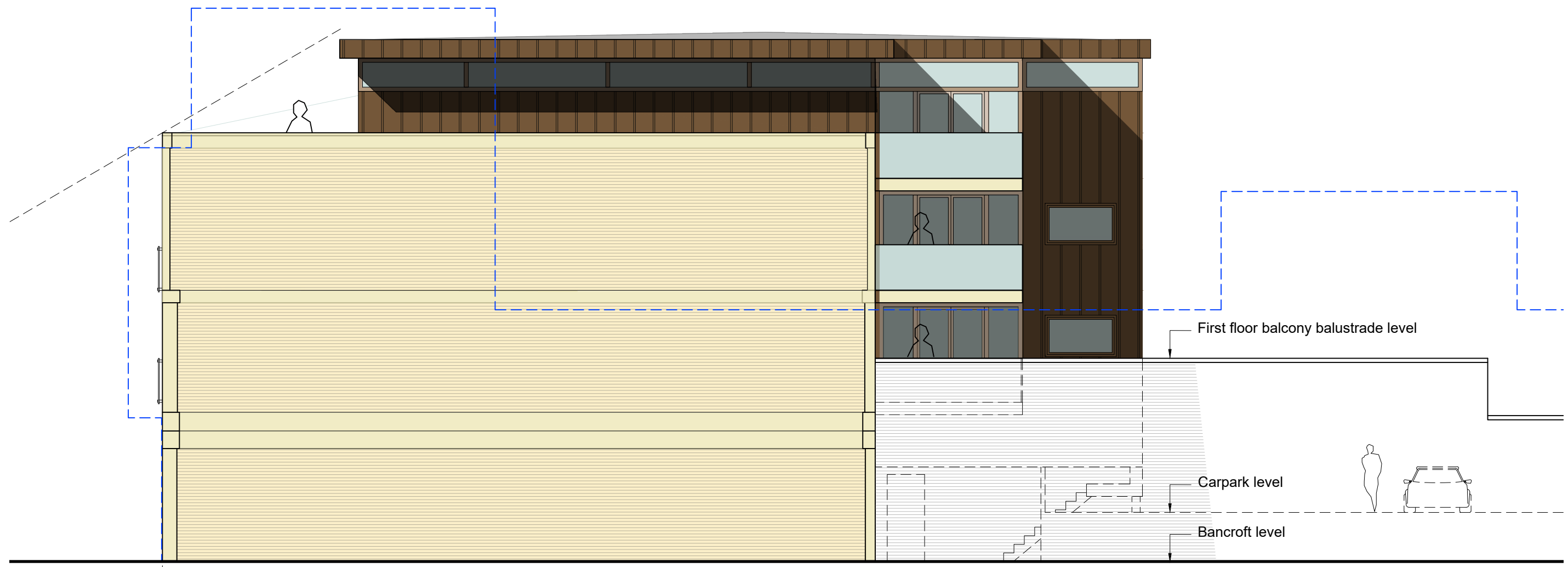
PROPOSED FRONT ELEVATION



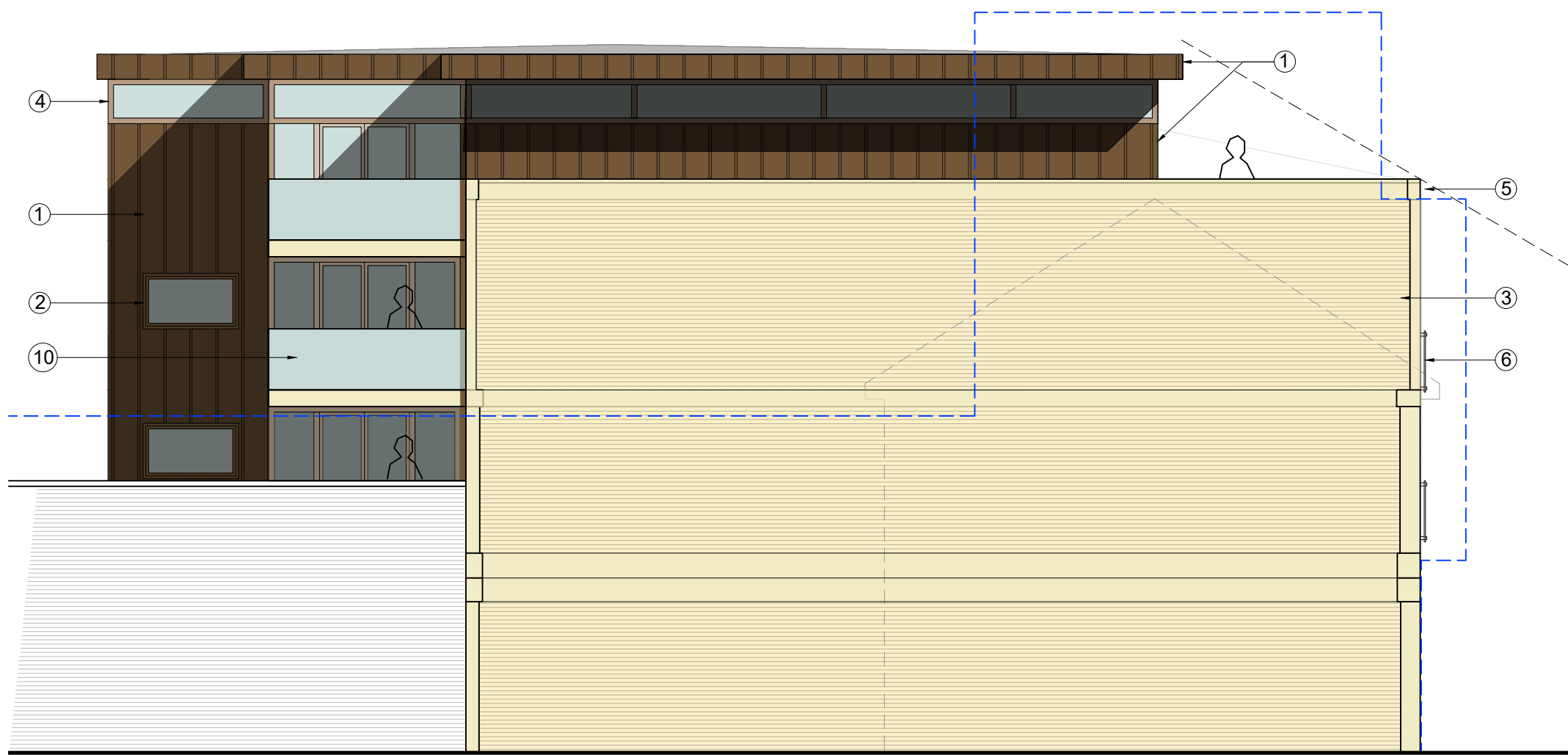
PROPOSED REAR ELEVATION



PROPOSED REAR ELEVATION & STAIR IN SECTION



PROPOSED SIDE ELEVATION (NE facing)



PROPOSED SIDE ELEVATION (SW facing)

Materials Legend

- ① - Antique Bronze Standing Seam
- ② - Antique Bronze Aluminum Windows & Doors
- ③ - London Stock Facing Bricks
- ④ - Clerestory
- ⑤ - Stone mouldings
- ⑥ - Decorative Black Metal Railings
- ⑦ - Black Cast Iron Rainwater goods
- ⑩ - Glass Balustrading

Notes:

--- Outline of existing building to be demolished

**Colin Eades
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Client: **Owners of Hitchin**

Project: **Redevelopment of
18 - 19 Bancroft,
Hitchin**

Drawing
Title: **PROPOSED ELEVATIONS
18 -19 BANCROFT**

Dwg no: **011**

Drawn: **AM** Date: **JAN 2025** Checked: **CE**

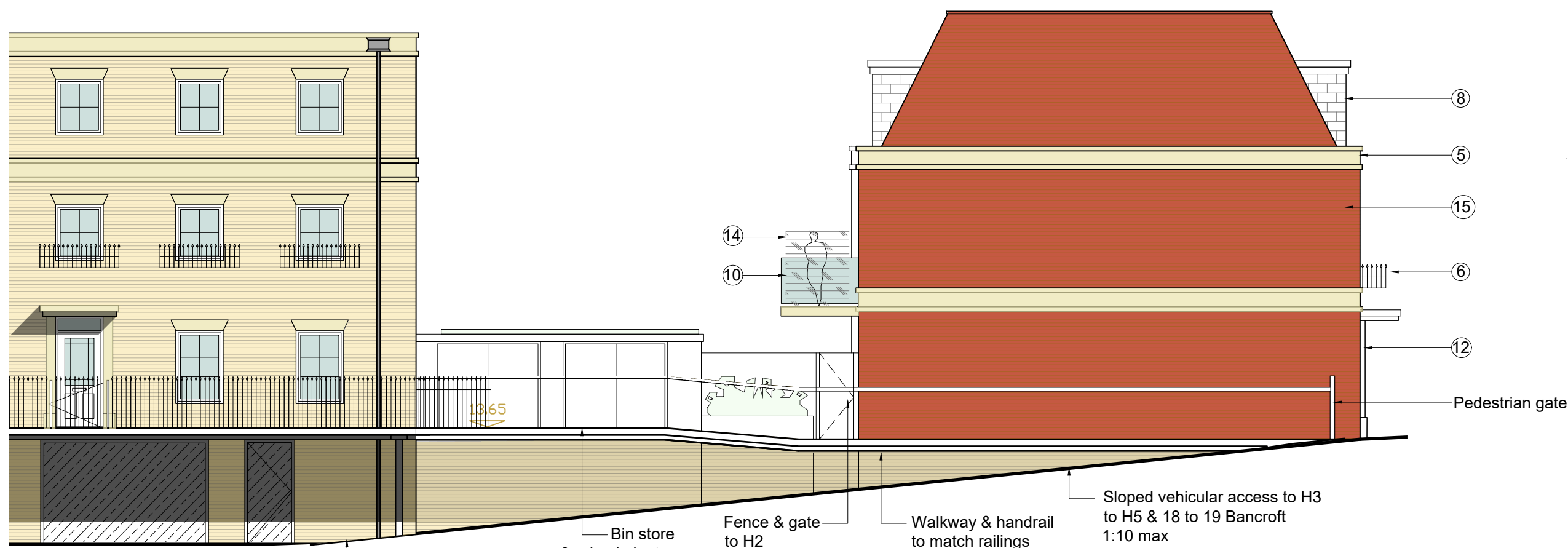
Scale: **1:100 @ A1**

Revisions:

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PROPOSED FRONT ELEVATIONS



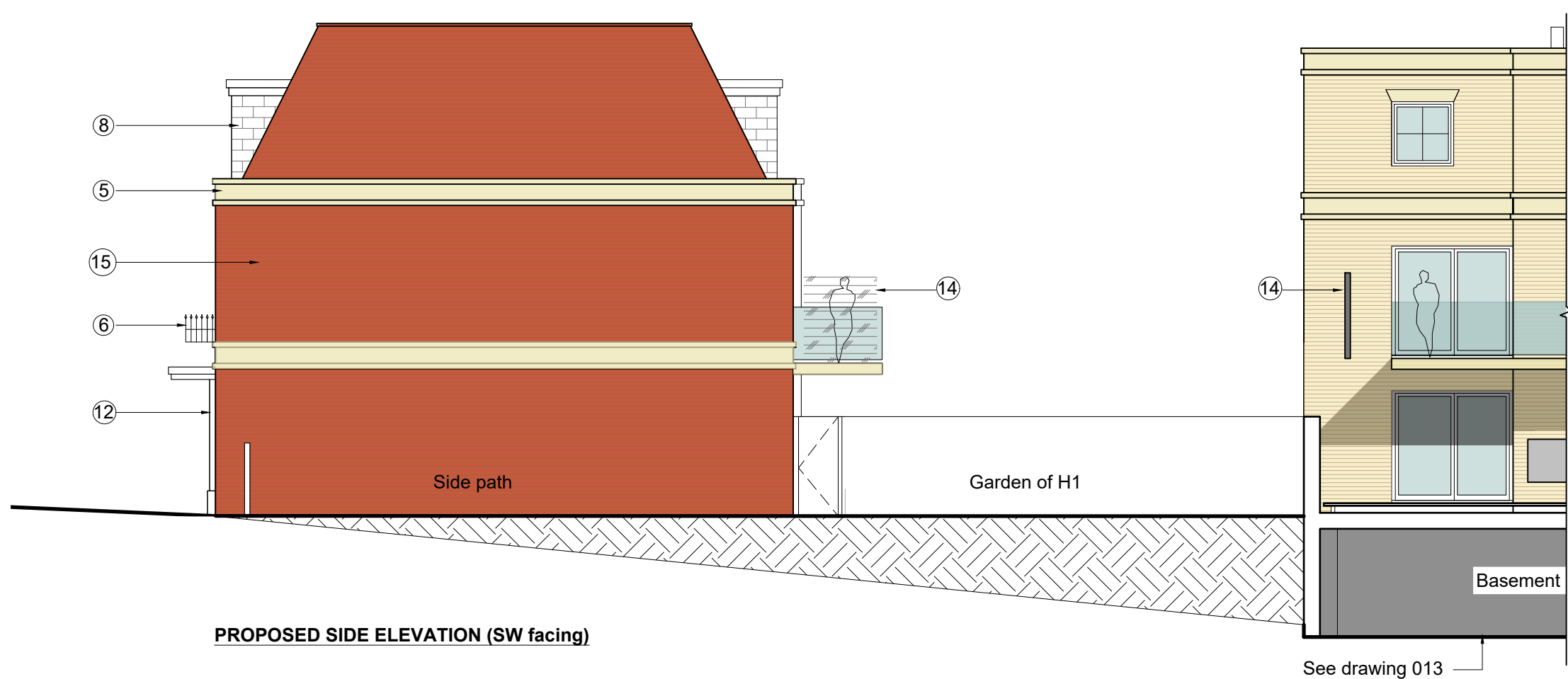
PROPOSED SIDE ELEVATION (NE facing)

Materials Legend

- ⑤ - Stone mouldings
- ⑥ - Decorative Black Metal Railings
- ⑦ - Black Cast Iron Rainwater goods
- ⑧ - Slate (Hanging) tiles
- ⑨ - White microporous painted hardwood Windows & Doors
- ⑩ - Glass Balustrading
- ⑪ - Brick Chimney
- ⑫ - White microporous painted hardwood Door case with fixed light & Canopy
- ⑬ - Sedum roof
- ⑭ - Etched glass privacy screens (position & design tbc)
- ⑮ - Red/Brindle Mix Facing Bricks



PROPOSED REAR ELEVATIONS



PROPOSED SIDE ELEVATION (SW facing)

Colin Eades
and Amy Moss

Rose Cottage, High Street, Gosmore, Hitchin, SG4 7QQ
colinweades@gmail.com - amy@mosspropertydevelopment.co.uk

Client: **Owners of Hitchin**

Project: **Redevelopment of
18 - 19 Bancroft,
Hitchin**

Drawing
Title: **PROPOSED ELEVATIONS
TOWNHOUSES
H1 & H2**

Dwg no: **012**

Drawn: **AM** Date: **JAN 2025** Checked: **CE**

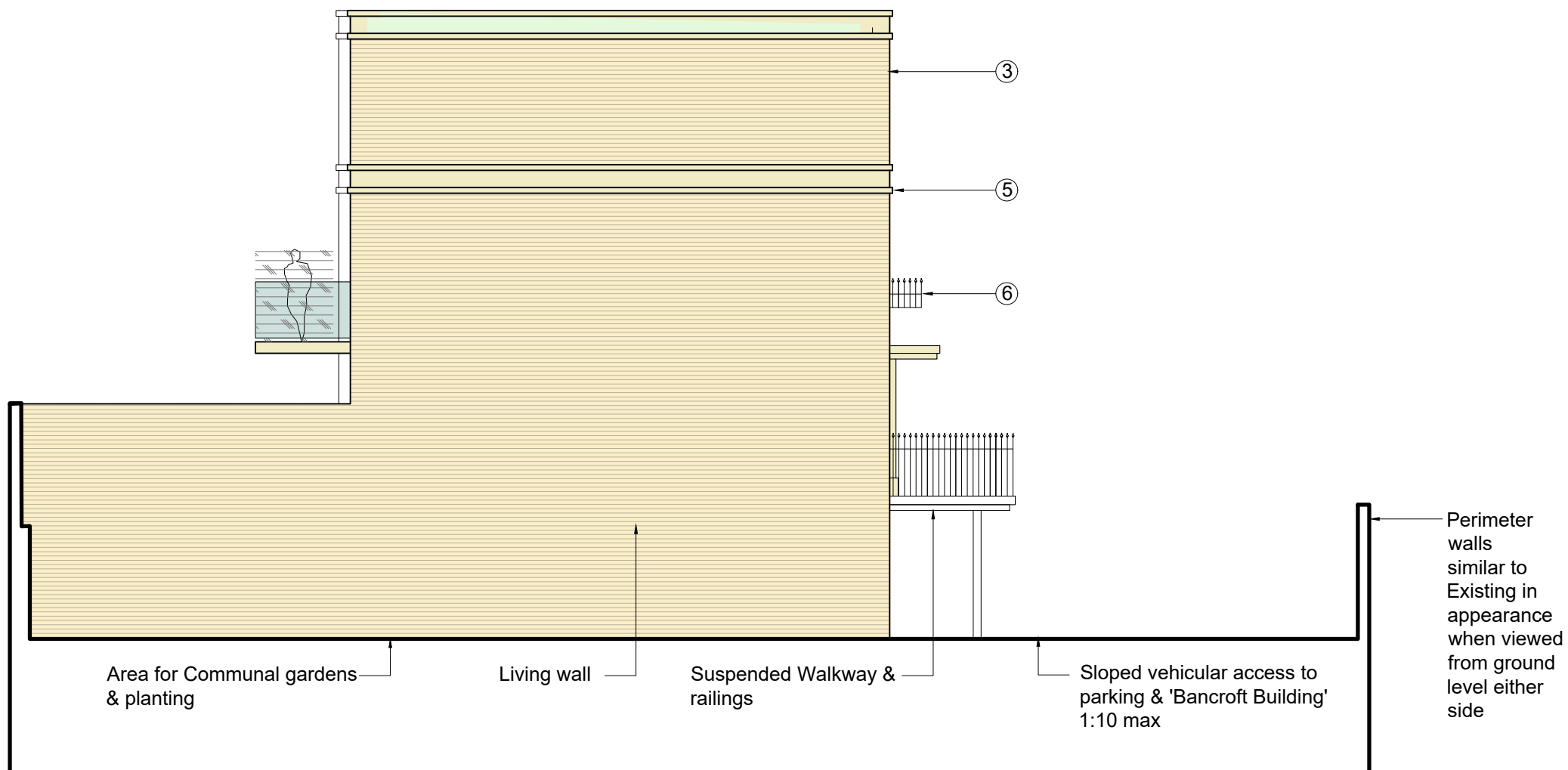
Scale: **1:100 @ A1**

Revisions:

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PROPOSED FRONT ELEVATIONS



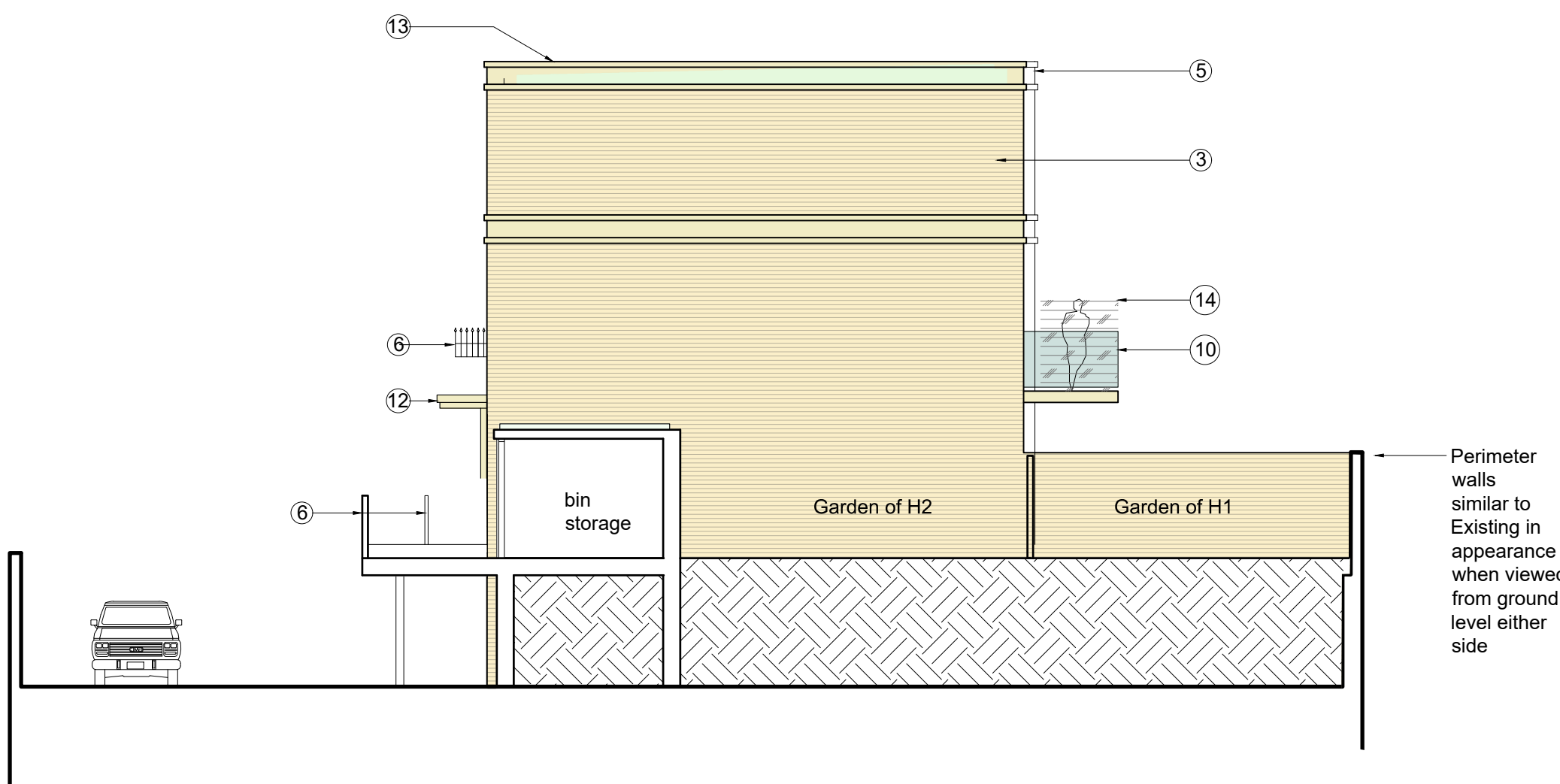
PROPOSED SIDE ELEVATION (SE facing)

Materials Legend

- ③ - London Stock Facing Bricks
- ⑤ - Stone mouldings
- ⑥ - Decorative Black Metal Railings
- ⑦ - Black Cast Iron Rainwater goods
- ⑨ - White microporous painted hardwood Windows & Doors
- ⑩ - Glass Balustrading
- ⑪ - Brick Chimney
- ⑫ - White microporous painted hardwood Door case with fixed light & Canopy
- ⑬ - Sedum roof
- ⑭ - Etched glass privacy screens (position & design tbc)



PROPOSED REAR ELEVATIONS

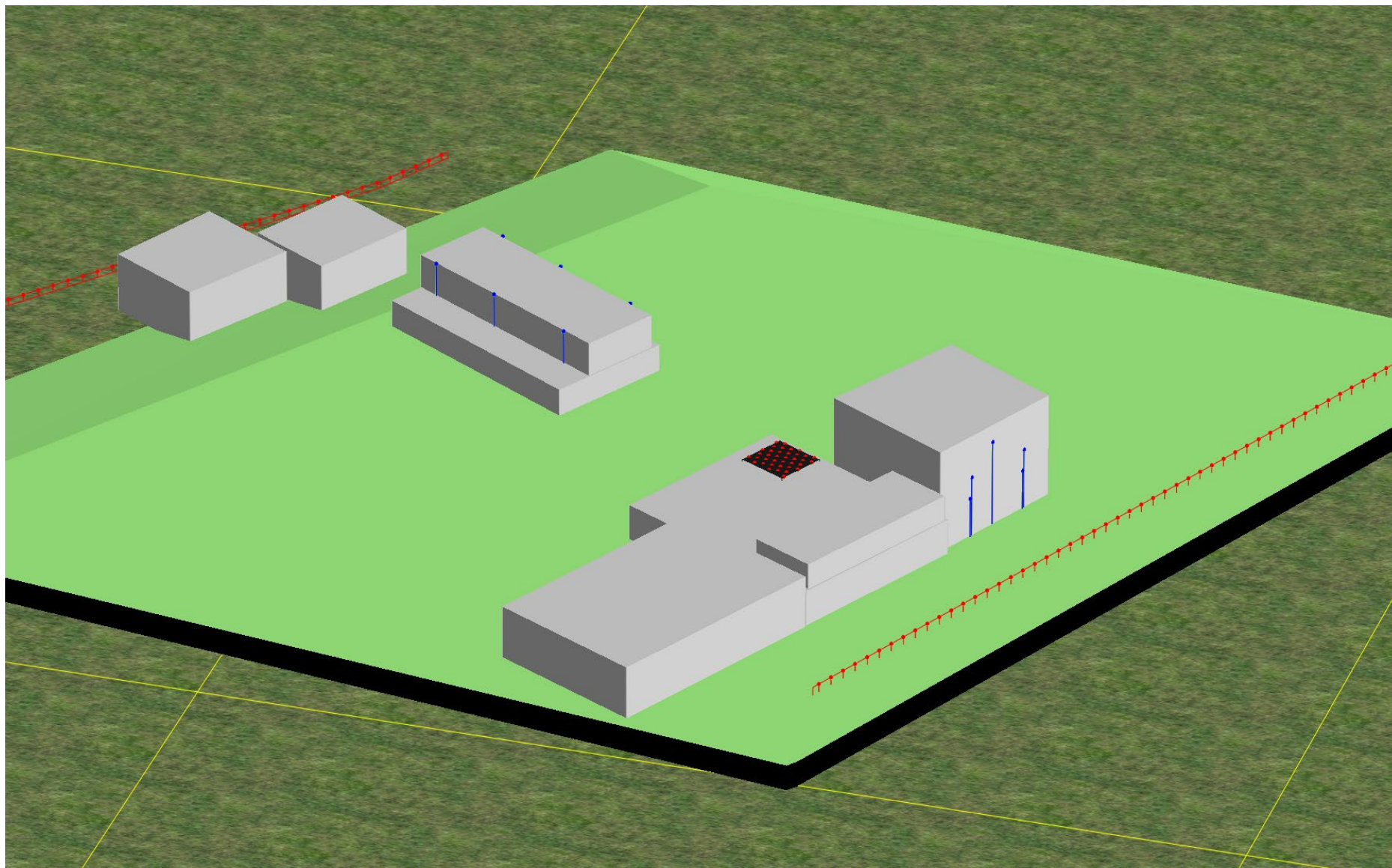


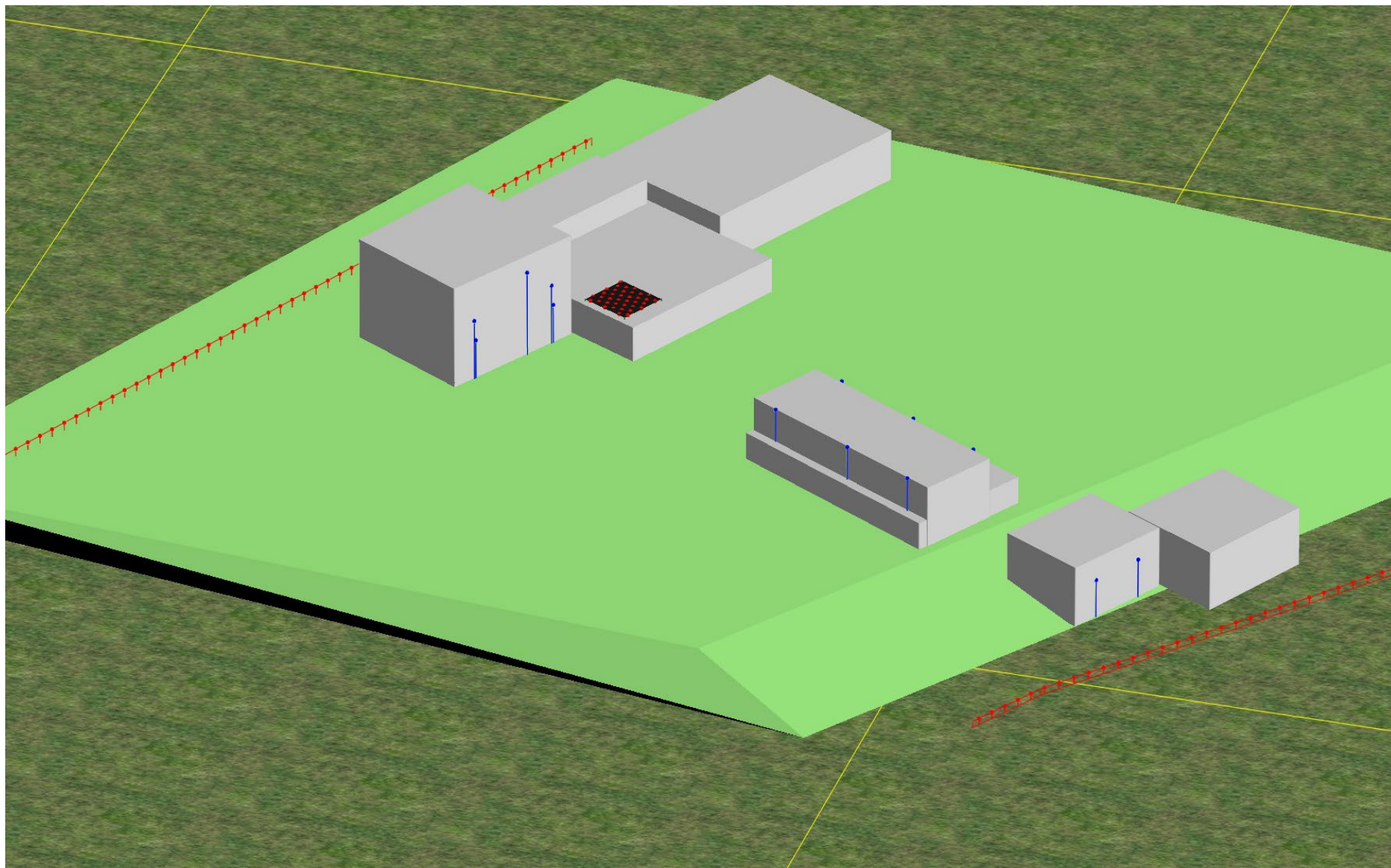
PROPOSED SIDE ELEVATION (NW facing)

Colin Eades and Amy Moss Rose Cottage, High Street, Gosmore, Hitchin, SG4 7QQ colinwkades@gmail.com - amy@mosspropertydevelopment.co.uk		
Client:	Owners of Hitchin	
Project:	Redevelopment of 18 - 19 Bancroft, Hitchin	
Drawing Title:	PROPOSED ELEVATIONS TOWNHOUSES H3 - H5	
Dwg no.	013	
Drawn:	AM	Date: JAN 2025 Checked: CE
Scale:	1:100 @ A1	
Revisions:		
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APPENDIX C

Noise Prediction Model





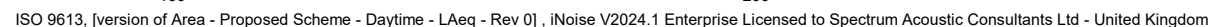
18-19 Bancroft, Hitchin

Predicted Ambient Noise Levels - Daytime LAeq,16hr

Report: Table of Results
 Model: Proposed Scheme - Daytime - LAeq - Rev 0
 LAeq per octave: total results for receivers
 Group: (main group)
 Group Reduction: Yes

Name			Day									
Receiver	Description	Height	Total	31	63	125	250	500	1000	2000	4000	8000
_A	R1. Apartment 1 (front)	4.50	65	--	43	48	54	57	62	59	51	40
_A	R1. Apartment 1 (rear)	4.50	62	--	41	50	51	54	58	56	50	44
_A	R10. House H5 (front)	4.50	50	--	31	38	39	42	47	44	36	20
_A	R10. House H5 (rear)	4.50	47	--	30	37	37	39	42	40	35	26
_A	R2. Apartment 2 (front)	4.50	65	--	43	48	54	57	62	59	51	40
_A	R2. Apartment 2 (rear)	4.50	53	--	34	42	42	45	48	47	42	35
_A	R3. Apartment 3 (front)	7.00	65	--	42	47	53	56	61	59	51	39
_A	R3. Apartment 3 (rear)	7.00	63	--	44	53	54	56	58	55	49	43
_A	R4. Apartment 4 (front)	7.00	65	--	42	47	53	56	61	59	51	39
_A	R4. Apartment 4 (rear)	7.00	55	--	34	43	45	48	50	48	42	35
_A	R5. Apartment 5 (front)	10.00	64	--	42	47	52	56	60	58	50	38
_A	R5. Apartment 5 (rear)	10.00	59	--	40	50	50	52	54	51	46	39
_A	R6. House H1	1.50	57	--	37	41	46	47	52	52	48	37
_A	R7. House H2	1.50	57	--	37	42	46	47	53	52	48	38
_A	R8. House H3 (front)	4.50	50	--	29	34	38	41	46	44	38	24
_A	R8. House H3 (rear)	4.50	42	--	28	33	33	34	36	34	28	17
_A	R9. House H4 (front)	4.50	50	--	30	35	38	40	46	44	36	21
_A	R9. House H4 (rear)	4.50	43	--	28	35	34	35	38	36	30	20

All shown dB values are A-weighted



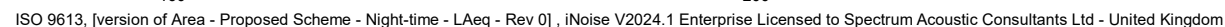
18-19 Bancroft, Hitchin

Predicted Ambient Noise Levels - Night-time LAeq,8hr

Report: Table of Results
 Model: Proposed Scheme - Night-time - LAeq - Rev 0
 LAeq per octave: total results for receivers
 Group: (main group)
 Group Reduction: Yes

Name			Night									
Receiver	Description	Height	Total	31	63	125	250	500	1000	2000	4000	8000
_A	R1. Apartment 1 (front)	4.50	59	--	35	39	47	51	56	53	42	33
_A	R1. Apartment 1 (rear)	4.50	61	--	36	47	48	51	54	55	55	47
_A	R10. House H5 (front)	7.00	47	--	26	36	36	38	42	41	37	23
_A	R10. House H5 (rear)	7.00	47	--	25	35	36	39	41	42	41	30
_A	R2. Apartment 2 (front)	4.50	59	--	35	39	47	51	56	53	42	33
_A	R2. Apartment 2 (rear)	4.50	52	--	28	39	39	42	44	46	47	38
_A	R3. Apartment 3 (front)	7.00	58	--	34	38	46	50	55	53	42	32
_A	R3. Apartment 3 (rear)	7.00	61	--	38	50	51	53	53	54	54	46
_A	R4. Apartment 4 (front)	7.00	58	--	34	38	46	50	55	53	42	32
_A	R4. Apartment 4 (rear)	7.00	53	--	29	40	41	45	46	47	47	38
_A	R5. Apartment 5 (front)	10.00	58	--	34	38	45	50	54	52	41	31
_A	R5. Apartment 5 (rear)	10.00	57	--	35	47	47	49	50	50	50	42
_A	R6. House H1	4.50	53	--	23	30	33	38	43	51	48	33
_A	R7. House H2	4.50	54	--	23	31	33	39	43	52	48	33
_A	R8. House H3 (front)	7.00	46	--	23	31	33	35	40	42	37	21
_A	R8. House H3 (rear)	7.00	42	--	22	31	32	34	36	37	34	20
_A	R9. House H4 (front)	7.00	46	--	24	33	34	36	40	41	36	19
_A	R9. House H4 (rear)	7.00	44	--	23	33	33	35	38	38	36	24

All shown dB values are A-weighted



18-19 Bancroft, Hitchin

Predicted Ambient Noise Levels - Night-time LAFmax - Apartment 1

Report: Table of Results
 Model: Proposed Scheme - Night-time - LAFmax - Rev 0
 LAeq per octave: by Source/Group for receiver _A - R1. Apartment 1 (front)
 Group: (main group)
 Group Reduction: Yes

Name Source/Group	Description	Height	Night Total	31	63	125	250	500	1000	2000	4000	8000
A	R1. Apartment 1 (front)	4.50	94	--	70	74	82	86	91	88	77	67
	Bancroft LAFmax	0.25	83	--	59	63	71	75	80	78	67	58
	Bancroft LAFmax	0.25	83	--	59	63	71	75	80	77	67	58
	Bancroft LAFmax	0.25	83	--	59	63	71	75	80	77	66	57
	Bancroft LAFmax	0.25	83	--	58	62	71	75	79	77	66	57
	Bancroft LAFmax	0.25	82	--	58	62	70	74	79	76	66	56
	Bancroft LAFmax	0.25	82	--	58	62	70	74	79	76	65	56
	Bancroft LAFmax	0.25	81	--	57	61	69	73	78	75	65	55
	Bancroft LAFmax	0.25	81	--	57	60	68	72	77	75	64	55
	Bancroft LAFmax	0.25	80	--	56	60	68	72	77	74	64	54
	Bancroft LAFmax	0.25	80	--	56	60	67	71	76	74	63	53
	Bancroft LAFmax	0.25	79	--	55	59	67	71	76	73	63	53
	Bancroft LAFmax	0.25	79	--	55	59	66	70	76	73	62	52
	Bancroft LAFmax	0.25	78	--	54	58	66	70	75	72	62	52
	Bancroft LAFmax	0.25	78	--	54	58	65	69	75	72	61	51
	Bancroft LAFmax	0.25	77	--	53	57	65	69	74	72	61	50
	Bancroft LAFmax	0.25	77	--	53	57	64	68	73	71	60	50
	Bancroft LAFmax	0.25	76	--	53	56	64	68	73	71	60	49
	Bancroft LAFmax	0.25	76	--	52	56	63	67	73	70	59	48
	Bancroft LAFmax	0.25	76	--	52	56	63	67	72	70	59	48
	Bancroft LAFmax	0.25	75	--	51	55	63	66	72	69	58	47
	Bancroft LAFmax	0.25	75	--	51	55	62	66	72	69	58	47
	Bancroft LAFmax	0.25	74	--	51	54	62	66	71	69	58	46
	Bancroft LAFmax	0.25	74	--	50	54	62	65	71	68	57	46
	Bancroft LAFmax	0.25	73	--	50	53	61	65	70	68	57	45
	Bancroft LAFmax	0.25	73	--	50	53	61	65	70	68	57	45
	Bancroft LAFmax	0.25	73	--	49	53	60	64	70	67	56	44
	Bancroft LAFmax	0.25	73	--	49	53	60	64	69	67	56	44
	Bancroft LAFmax	0.25	72	--	49	52	60	63	69	67	55	43
	Bancroft LAFmax	0.25	72	--	48	52	59	63	69	67	55	43
	Bancroft LAFmax	0.25	72	--	47	52	59	63	68	66	55	42
	Bancroft LAFmax	0.25	71	--	48	52	59	63	68	66	55	42
	Bancroft LAFmax	0.25	71	--	47	51	59	62	68	66	54	41
	Bancroft LAFmax	0.25	71	--	47	51	58	62	68	65	54	41
	Bancroft LAFmax	0.25	70	--	46	50	58	61	67	65	53	40
	Bancroft LAFmax	0.25	70	--	46	50	57	61	67	64	53	39
	Bancroft LAFmax	0.25	69	--	45	50	57	60	66	64	52	39
	Bancroft LAFmax	0.25	69	--	45	49	56	60	66	64	52	38
	Bancroft LAFmax	0.25	69	--	45	49	56	60	65	63	51	38
	Plant	0.25	29	--	16	23	18	20	21	21	21	11
	GSW LAFmax	0.25	21	--	3	6	4	7	12	19	13	-11
	GSW LAFmax	0.25	21	--	3	6	4	7	12	19	13	-9
	GSW LAFmax	0.25	21	--	3	6	4	7	11	19	13	-9

All shown dB values are A-weighted

18-19 Bancroft, Hitchin
Predicted Ambient Noise Levels - Night-time LAFmax - House 1

Report: Table of Results
Model: Proposed Scheme - Night-time - LAFmax - Rev 0
LAeq per octave: by Source/Group for receiver _A - R6. House H1
Group: (main group)
Group Reduction: Yes

Name			Night									
Source/Group	Description	Height	Total	31	63	125	250	500	1000	2000	4000	8000
A	R6. House H1	4.50	76	--	47	53	56	61	66	74	70	55
	GSW LAFmax	0.25	67	--	35	42	47	52	57	65	61	47
	GSW LAFmax	0.25	67	--	35	43	47	52	56	65	61	47
	GSW LAFmax	0.25	67	--	34	43	46	51	56	64	61	46
	GSW LAFmax	0.25	66	--	34	42	45	50	55	64	60	45
	GSW LAFmax	0.25	65	--	33	42	44	50	54	63	59	44
	GSW LAFmax	0.25	65	--	34	41	44	49	54	62	59	44
	GSW LAFmax	0.25	64	--	34	41	43	49	53	62	58	43
	GSW LAFmax	0.25	64	--	33	40	43	48	53	62	58	44
	GSW LAFmax	0.25	63	--	33	40	43	48	53	61	57	42
	GSW LAFmax	0.25	62	--	32	39	42	47	52	60	57	41
	GSW LAFmax	0.25	62	--	31	38	41	46	51	59	56	40
	GSW LAFmax	0.25	60	--	30	37	40	44	50	58	54	39
	GSW LAFmax	0.25	60	--	30	37	39	44	49	58	54	38
	GSW LAFmax	0.25	59	--	29	36	38	43	49	57	53	37
	GSW LAFmax	0.25	59	--	28	35	38	42	48	57	52	36
	GSW LAFmax	0.25	58	--	28	34	37	42	47	56	52	35
	GSW LAFmax	0.25	54	--	28	35	37	41	45	52	46	29
	GSW LAFmax	0.25	47	--	27	32	33	36	39	45	38	21
	GSW LAFmax	0.25	44	--	25	30	31	33	35	41	35	18
	Bancroft LAFmax	0.25	42	--	30	30	34	35	38	34	20	-1
	Bancroft LAFmax	0.25	42	--	30	30	34	35	38	34	20	-1
	GSW LAFmax	0.25	42	--	24	29	29	31	33	39	33	16
	Bancroft LAFmax	0.25	41	--	29	29	33	34	37	33	19	-1
	Bancroft LAFmax	0.25	41	--	30	29	33	34	37	33	19	-1
	Bancroft LAFmax	0.25	41	--	30	29	33	34	37	33	19	-1
	Bancroft LAFmax	0.25	41	--	30	29	33	34	37	33	19	-2
	Bancroft LAFmax	0.25	41	--	30	30	33	34	37	33	18	-2
	Bancroft LAFmax	0.25	41	--	30	29	33	34	37	33	19	-2
	Bancroft LAFmax	0.25	41	--	30	30	33	34	37	33	18	-3
	Bancroft LAFmax	0.25	41	--	29	29	32	33	37	33	19	0
	Bancroft LAFmax	0.25	41	--	29	29	32	33	37	33	19	0
	Bancroft LAFmax	0.25	41	--	29	29	32	33	37	33	19	0
	Bancroft LAFmax	0.25	41	--	29	29	32	33	37	33	19	0
	Bancroft LAFmax	0.25	41	--	29	29	32	33	37	33	19	0
	GSW LAFmax	0.25	39	--	22	26	26	28	30	36	30	13
	Bancroft LAFmax	0.25	39	--	24	24	28	31	35	32	19	0

All shown dB values are A-weighted

18-19 Bancroft, Hitchin
Predicted Ambient Noise Levels - Night-time LAFmax - House 5

Report: Table of Results
Model: Proposed Scheme - Night-time - LAFmax - Rev 0
LAeq per octave: by Source/Group for receiver _A - R10. House H5 (front)
Group: (main group)
Group Reduction: Yes

Name			Night									
Source/Group	Description	Height	Total	31	63	125	250	500	1000	2000	4000	8000
A	R10. House H5 (front)	7.00	78	--	56	60	66	69	75	73	62	46
	Bancroft LAFmax	0.25	67	--	44	48	55	58	64	62	50	35
	Bancroft LAFmax	0.25	67	--	44	48	55	58	64	62	50	35
	Bancroft LAFmax	0.25	67	--	44	48	55	58	64	62	50	35
	Bancroft LAFmax	0.25	67	--	44	47	54	58	64	62	49	35
	Bancroft LAFmax	0.25	67	--	44	47	54	57	64	61	49	34
	Bancroft LAFmax	0.25	67	--	44	47	54	57	63	61	49	34
	Bancroft LAFmax	0.25	66	--	43	47	54	57	63	61	49	34
	Bancroft LAFmax	0.25	66	--	43	47	54	57	63	61	49	33
	Bancroft LAFmax	0.25	66	--	43	47	54	57	63	61	48	33
	Bancroft LAFmax	0.25	66	--	43	47	53	57	63	61	48	33
	Bancroft LAFmax	0.25	66	--	43	46	53	56	63	60	48	32
	Bancroft LAFmax	0.25	66	--	43	46	53	56	62	60	48	32
	Bancroft LAFmax	0.25	65	--	42	46	53	56	62	60	47	31
	Bancroft LAFmax	0.25	65	--	42	46	53	56	62	60	47	31
	Bancroft LAFmax	0.25	65	--	42	46	53	56	62	60	47	31
	Bancroft LAFmax	0.25	65	--	42	46	52	55	62	59	47	30
	Bancroft LAFmax	0.25	60	--	40	43	50	52	57	53	38	21
	Bancroft LAFmax	0.25	55	--	39	42	47	48	52	47	33	16
	Bancroft LAFmax	0.25	53	--	38	40	44	45	49	44	30	14
	GSW LAFmax	0.25	52	--	22	29	31	36	41	50	45	27
	GSW LAFmax	0.25	52	--	19	28	31	36	41	50	45	27
	GSW LAFmax	0.25	52	--	22	29	31	35	41	50	45	27
	GSW LAFmax	0.25	52	--	22	29	31	35	41	50	45	27
	GSW LAFmax	0.25	52	--	22	29	31	35	41	50	45	27
	GSW LAFmax	0.25	52	--	22	28	31	35	41	50	45	26
	GSW LAFmax	0.25	50	--	20	27	29	34	40	48	44	25
	Bancroft LAFmax	0.25	50	--	36	37	41	43	45	44	32	16
	Bancroft LAFmax	0.25	50	--	36	37	41	43	45	44	32	16
	Bancroft LAFmax	0.25	50	--	35	37	41	43	45	44	32	16
	Bancroft LAFmax	0.25	50	--	35	37	41	43	45	44	32	16
	Bancroft LAFmax	0.25	50	--	35	37	41	43	45	44	32	16
	Bancroft LAFmax	0.25	49	--	35	37	41	43	45	41	29	14
	Bancroft LAFmax	0.25	49	--	35	37	41	43	45	41	29	14
	Bancroft LAFmax	0.25	49	--	35	37	41	42	45	41	29	13
	Bancroft LAFmax	0.25	49	--	35	37	41	42	45	41	29	14
	Bancroft LAFmax	0.25	49	--	35	36	41	42	45	41	29	14
	Bancroft LAFmax	0.25	49	--	35	36	41	42	45	41	29	13
	Bancroft LAFmax	0.25	48	--	36	37	40	40	43	40	26	11
	GSW LAFmax	0.25	48	--	20	27	29	33	38	46	40	22
	Bancroft LAFmax	0.25	47	--	35	37	40	40	42	36	23	8
	Bancroft LAFmax	0.25	46	--	35	35	38	38	42	39	26	11
	Bancroft LAFmax	0.25	46	--	34	33	36	37	40	41	29	13
	Bancroft LAFmax	0.25	45	--	34	34	37	37	41	38	26	11

All shown dB values are A-weighted

APPENDIX D

Intrusive Noise Calculations

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project:	18-19 Bancroft, Hitchin
Project number:	24109
Date:	27/02/2025

Plot:	Apartment 1
Room:	LKD

Daytime (<i>L</i> _{Aeq,16hr})				Octave band centre frequency										Broadband term	
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k			
EXTERNAL NOISE LEVEL															
External noise level			Façade 1	<i>L</i> _{eq,1}	69	64	63	60	62	58	50	41		<i>L</i> _{Aeq,1}	65 dB
Façade correction factor				C	0	0	0	0	0	0	0	0			
INCIDENT FAÇADE NOISE LEVEL															
Incident noise level			Façade 1	<i>L</i> _{eq,ff}	69	64	63	60	62	58	50	41		<i>L</i> _{Aeq,ff}	65 dB
ROOM DATA															
Room description and reverberation time	Volume	434	Living Room	RT60	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3			s
FAÇADE ELEMENTS (Façade 1)															
Glazing	Area	5	Generic 10/6-16/6	Rw	23	24	24	32	37	37	44	47		Rw / Rw+Ctr	35 / 32 dB
Wall	Area	11.5	Brick and block external wall	Rw	34	40	44	45	51	56	60	63		Rw / Rw+Ctr	50 / 47 dB
Vent	No. off.	2	Greenwood EHA574 (Acoustic trickle)	Dn,e	34	34	40	39	42	49	43	43		Dn,e,w / Dn,e,w+Ctr	44 / 42 dB
None			--												
RESULTS															
Total calculated indoor noise level				<i>L</i> _{eq,2}	37	31	28	20	16	9	1	-		<i>L</i> _{Aeq,2}	23 dB

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project:	18-19 Bancroft, Hitchin
Project number:	24109
Date:	27/02/2025

Plot:	Apartment 1
Room:	Bedroom

Daytime ($L_{Aeq,16hr}$)				Octave band centre frequency										Broadband term	
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k			
EXTERNAL NOISE LEVEL															
External noise level			Façade 1	$L_{eq,1}$	69	64	63	60	62	58	50	41	$L_{Aeq,1}$	65 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0			
INCIDENT FAÇADE NOISE LEVEL															
Incident noise level			Façade 1	$L_{eq,ff}$	69	64	63	60	62	58	50	41	$L_{Aeq,ff}$	65 dB	
ROOM DATA															
Room description and reverberation time	Volume	60	Bedroom	RT60	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2		s	
FAÇADE ELEMENTS (Façade 1)															
Glazing	Area	5	Pilkington Optiphon 10/16argon/8.8	Rw	27	28	31	42	45	50	58	62	Rw / Rw+Ctr	44 / 38 dB	
Wall	Area	11.5	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr	50 / 47 dB	
Vent	No. off.	1	Greenwood EHA574 (Acoustic trickle)	Dn,e	34	34	40	39	42	49	43	43	Dn,e,w / Dn,e,w+Ctr	44 / 42 dB	
None			--												
RESULTS															
Total calculated indoor noise level				$L_{eq,2}$	41	35	29	22	19	9	5	-	$L_{Aeq,2}$	26 dB	

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project:	18-19 Bancroft, Hitchin
Project number:	24109
Date:	27/02/2025

Plot:	Apartment 1
Room:	Bedroom

Night time ($L_{Aeq,8hr}$)				Octave band centre frequency										Broadband term			
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k					
EXTERNAL NOISE LEVEL																	
External noise level			Façade 1	$L_{eq,1}$	61	55	56	54	56	52	41	34	$L_{Aeq,1}$			59 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0					
INCIDENT FAÇADE NOISE LEVEL																	
Incident noise level			Façade 1	$L_{eq,ff}$	61	55	56	54	56	52	41	34	$L_{Aeq,ff}$			59 dB	
ROOM DATA																	
Room description and reverberation time	Volume	60	Bedroom	RT60	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2				s	
FAÇADE ELEMENTS (Façade 1)																	
Glazing	Area	5	Pilkington Optiphon 10/16argon/8.8	Rw	27	28	31	42	45	50	58	62	Rw / Rw+Ctr			44 / 38 dB	
Wall	Area	11.5	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr			50 / 47 dB	
Vent	No. off.	1	Greenwood EHA574 (Acoustic trickle)	Dn,e	34	34	40	39	42	49	43	43	Dn,e,w / Dn,e,w+Ctr			44 / 42 dB	
None			--														
RESULTS																	
Total calculated indoor noise level				$L_{eq,2}$	33	26	22	16	13	3	-	-	$L_{Aeq,2}$			19 dB	

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project:	18-19 Bancroft, Hitchin
Project number:	24109
Date:	27/02/2025

Plot:	Apartment 1
Room:	Bedroom

Night time ($L_{A\text{Max}}$)				Octave band centre frequency													
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k	Broadband term				
EXTERNAL NOISE LEVEL																	
External noise level			Façade 1	$L_{\text{Max},1}$	85	79	80	78	80	77	66	59	$L_{A\text{Max},1}$ 83 dB				
Façade correction factor				C	0	0	0	0	0	0	0	0					

INCIDENT FAÇADE NOISE LEVEL															
Incident noise level			Façade 1	$L_{\text{Max},ff}$	85	79	80	78	80	77	66	59	$L_{A\text{Max},ff}$ 83 dB		

ROOM DATA															
Room description and reverberation time	Volume	60	Bedroom	RT60	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2	s		

FAÇADE ELEMENTS (Façade 1)															
Glazing	Area	5	Pilkington Optiphon 10/16argon/8.8	Rw	27	28	31	42	45	50	58	62	R_w / R_{w+Ctr} 44 / 38 dB		
Wall	Area	11.5	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	R_w / R_{w+Ctr} 50 / 47 dB		
Vent	No. off.	1	Greenwood EHA574 (Acoustic trickle)	Dn,e	34	34	40	39	42	49	43	43	$D_{n,e,w} / D_{n,e,w+Ctr}$ 44 / 42 dB		
None			--												

RESULTS															
Total calculated indoor noise level				$L_{\text{Max},2}$	57	50	46	40	37	28	21	12	$L_{A\text{Max},2}$ 43 dB		

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project:	18-19 Bancroft, Hitchin
Project number:	24109
Date:	27/02/2025

Plot:	House 1
Room:	LKD

Daytime ($L_{Aeq,16hr}$)				Octave band centre frequency										Broadband term			
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k					
EXTERNAL NOISE LEVEL																	
External noise level			Façade 1	$L_{eq,1}$	63	57	55	50	52	51	47	38	$L_{Aeq,1}$			57 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0					
INCIDENT FAÇADE NOISE LEVEL																	
Incident noise level			Façade 1	$L_{eq,ff}$	63	57	55	50	52	51	47	38	$L_{Aeq,ff}$			57 dB	
ROOM DATA																	
Room description and reverberation time	Volume	146	Living Room	RT60	0.6	0.6	0.5	0.5	0.4	0.4	0.4	0.3				s	
FAÇADE ELEMENTS (Façade 1)																	
Glazing	Area	8	Generic 4/6-16/4	Rw	20	21	17	25	35	37	31	36	Rw / Rw+Ctr			29 / 25 dB	
Wall	Area	50	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr			50 / 47 dB	
Vent	No. off.	2	Greenwood 4000 SBW (Hit and miss)	Dn,e	32	38	37	34	30	34	37	46	Dn,e,w / Dn,e,w+Ctr			33 / 32 dB	
None			--														
RESULTS																	
Total calculated indoor noise level				$L_{eq,2}$	41	33	33	22	21	16	12	-	$L_{Aeq,2}$			28 dB	

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project:	18-19 Bancroft, Hitchin
Project number:	24109
Date:	27/02/2025

Plot:	House 1
Room:	Bedroom 3

Daytime ($L_{Aeq,16hr}$)				Octave band centre frequency										Broadband term			
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k					
EXTERNAL NOISE LEVEL																	
External noise level			Façade 1	$L_{eq,1}$	63	57	55	50	52	51	47	38	$L_{Aeq,1}$			57 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0					
INCIDENT FAÇADE NOISE LEVEL																	
Incident noise level			Façade 1	$L_{eq,ff}$	63	57	55	50	52	51	47	38	$L_{Aeq,ff}$			57 dB	
ROOM DATA																	
Room description and reverberation time	Volume	24	Bedroom	RT60	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2				s	
FAÇADE ELEMENTS (Façade 1)																	
Glazing	Area	1	Generic 4/6-16/4	Rw	20	21	17	25	35	37	31	36	Rw / Rw+Ctr			29 / 25 dB	
Wall	Area	14	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr			50 / 47 dB	
Vent	No. off.	1	Greenwood 4000 SBW (Hit and miss)	Dn,e	32	38	37	34	30	34	37	46	Dn,e,w / Dn,e,w+Ctr			33 / 32 dB	
None			--														
RESULTS																	
Total calculated indoor noise level				$L_{eq,2}$	40	32	31	22	24	19	13	-	$L_{Aeq,2}$			28 dB	

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project:	18-19 Bancroft, Hitchin
Project number:	24109
Date:	27/02/2025

Plot:	House 1
Room:	Bedroom 3

Night time ($L_{Aeq,8hr}$)				Octave band centre frequency										Broadband term			
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k					
EXTERNAL NOISE LEVEL																	
External noise level			Façade 1	$L_{eq,1}$	49	46	42	41	43	50	47	34	$L_{Aeq,1}$			53 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0					
INCIDENT FAÇADE NOISE LEVEL																	
Incident noise level			Façade 1	$L_{eq,ff}$	49	46	42	41	43	50	47	34	$L_{Aeq,ff}$			53 dB	
ROOM DATA																	
Room description and reverberation time	Volume	24	Bedroom	RT60	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2				s	
FAÇADE ELEMENTS (Façade 1)																	
Glazing	Area	1	Generic 4/6-16/4	Rw	20	21	17	25	35	37	31	36	Rw / Rw+Ctr			29 / 25 dB	
Wall	Area	14	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr			50 / 47 dB	
Vent	No. off.	1	Greenwood 4000 SBW (Hit and miss)	Dn,e	32	38	37	34	30	34	37	46	Dn,e,w / Dn,e,w+Ctr			33 / 32 dB	
None			--														
RESULTS																	
Total calculated indoor noise level				$L_{eq,2}$	26	21	18	13	15	18	13	-	$L_{Aeq,2}$			22 dB	

Calculated Indoor Ambient Noise Levels (as per BS 8233:2014 Annex G)



Project:	18-19 Bancroft, Hitchin
Project number:	24109
Date:	27/02/2025

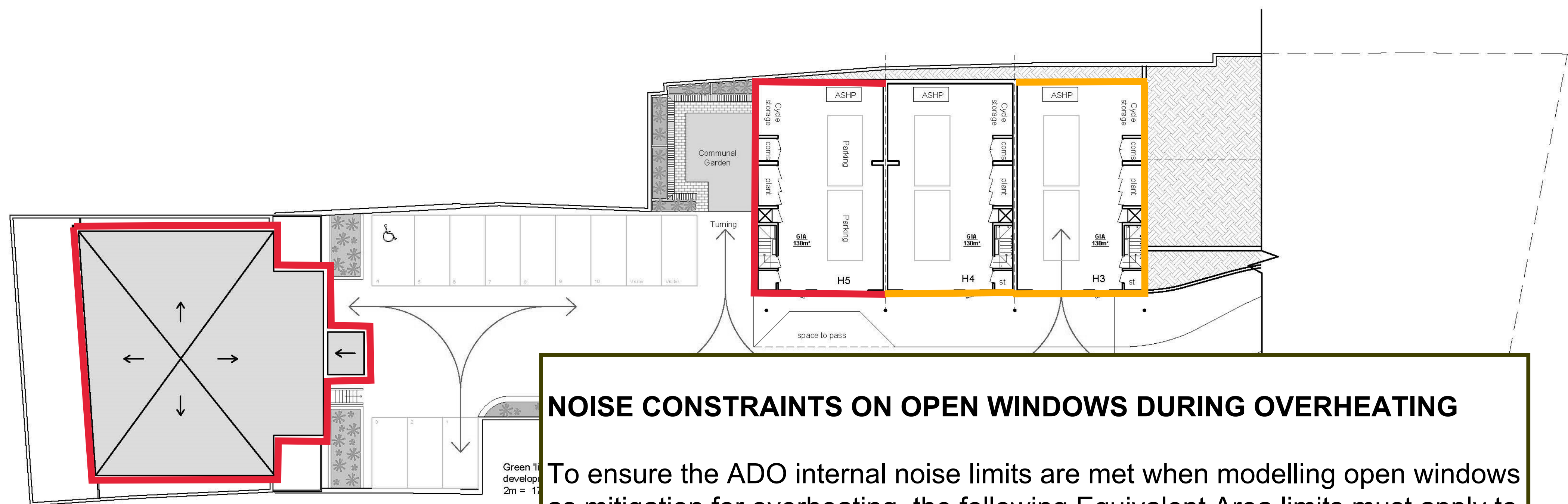
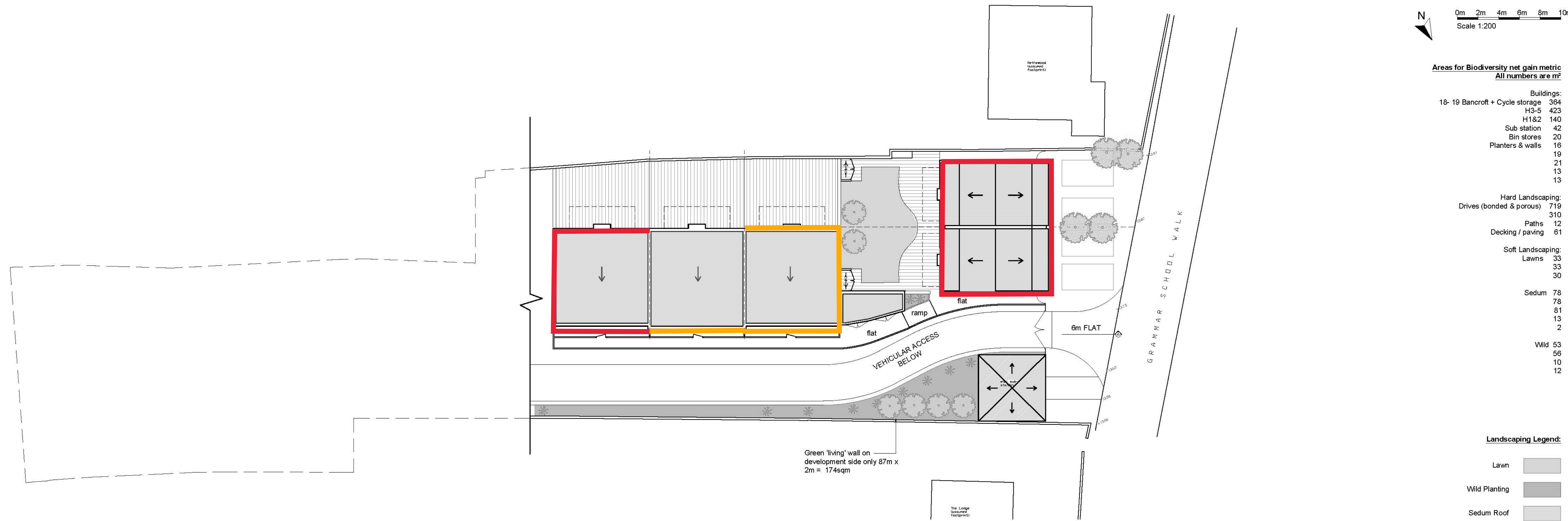
Plot:	House 1
Room:	Bedroom 3

Night time ($L_{A\text{Max}}$)				Octave band centre frequency										Broadband term			
	Unit	Value	Description	Term	63	125	250	500	1k	2k	4k	8k					
EXTERNAL NOISE LEVEL																	
External noise level			Façade 1	$L_{\text{Max},1}$	61	58	56	55	57	64	60	48	$L_{A\text{Max},1}$			67 dB	
Façade correction factor				C	0	0	0	0	0	0	0	0					
INCIDENT FAÇADE NOISE LEVEL																	
Incident noise level			Façade 1	$L_{\text{Max},ff}$	61	58	56	55	57	64	60	48	$L_{A\text{Max},ff}$			67 dB	
ROOM DATA																	
Room description and reverberation time	Volume	24	Bedroom	RT60	0.4	0.5	0.4	0.4	0.3	0.3	0.3	0.2				s	
FAÇADE ELEMENTS (Façade 1)																	
Glazing	Area	1	Generic 4/6-16/4	Rw	20	21	17	25	35	37	31	36	Rw / Rw+Ctr			29 / 25 dB	
Wall	Area	14	Brick and block external wall	Rw	34	40	44	45	51	56	60	63	Rw / Rw+Ctr			50 / 47 dB	
Vent	No. off.	1	Greenwood 4000 SBW (Hit and miss)	Dn,e	32	38	37	34	30	34	37	46	Dn,e,w / Dn,e,w+Ctr			33 / 32 dB	
None			--														
RESULTS																	
Total calculated indoor noise level				$L_{\text{Max},2}$	38	33	32	27	29	32	26	5	$L_{A\text{Max},2}$			36 dB	



APPENDIX D

ADO by-Façade Analysis



NOISE CONSTRAINTS ON OPEN WINDOWS DURING OVERHEATING

To ensure the ADO internal noise limits are met when modelling open windows as mitigation for overheating, the following Equivalent Area limits must apply to bedroom windows:

- Red facades: Windows closed
- Orange facades: $EA \leq 4\%$ of the bedroom floor area
- Unmarked facades: $EA \leq 13\%$ of the bedroom floor area

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Client: Owners of Hitchin

Project: Redevelopment of
18 - 19 Bancroft,
Hitchin

Drawing Title: PROPOSED SITE ROOF
PLAN & LANDSCAPING

Dwg no: 005

Drawn: AM Date: JAN 2025 Checked: CE

Scale: 1:200 @ A1

Revisions:

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