Aval Consulting Group.

Noise Impact Assessment

Land on Brendon Avenue, Moston, M40 9DN

Client Name: MKenny Properties Limited

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1. Introduction

1.1 Overview

AVAL Consulting Group Limited (ACGL) has been commissioned to carry out a Noise Impact Assessment for the proposed development at Land on Brendon Avenue, Moston, M40 9DN. The site benefits from being in a residential area and therefore considered appropriate for residential usage with adequate acoustic design. The proposal consists of erection of 6 x 2 storey dwellinghouses (Class C3) with associated landscaping, parking, and boundary treatment. This is hereafter referred to as “the proposed development”.

Detailed site drawings are presented in Appendix B.

1.2 Objective

The planning process requires evidence from a noise impact assessment that mitigation measures can ensure that noise can be reduced to acceptable levels within the premises. BS:8223 guidance suggests that prior to developing a scheme, details of the measures should be considered so that internal sound levels within all habitable rooms do not exceed 35 dB(A) $L_{Aeq,16hours}$ (07:00- 23:00); and internal sound levels within all bedrooms that do not exceed 30 dB(A) $L_{Aeq,\ 8hours}$ (23:00-07:00).

The purpose of the noise impact assessment is to ensure that the proposed scheme and its usage are suitable for habitation in relation to the prevailing noise in the surrounding area’s environment. If needed, mitigation measures to accompany the planning application will be provided.

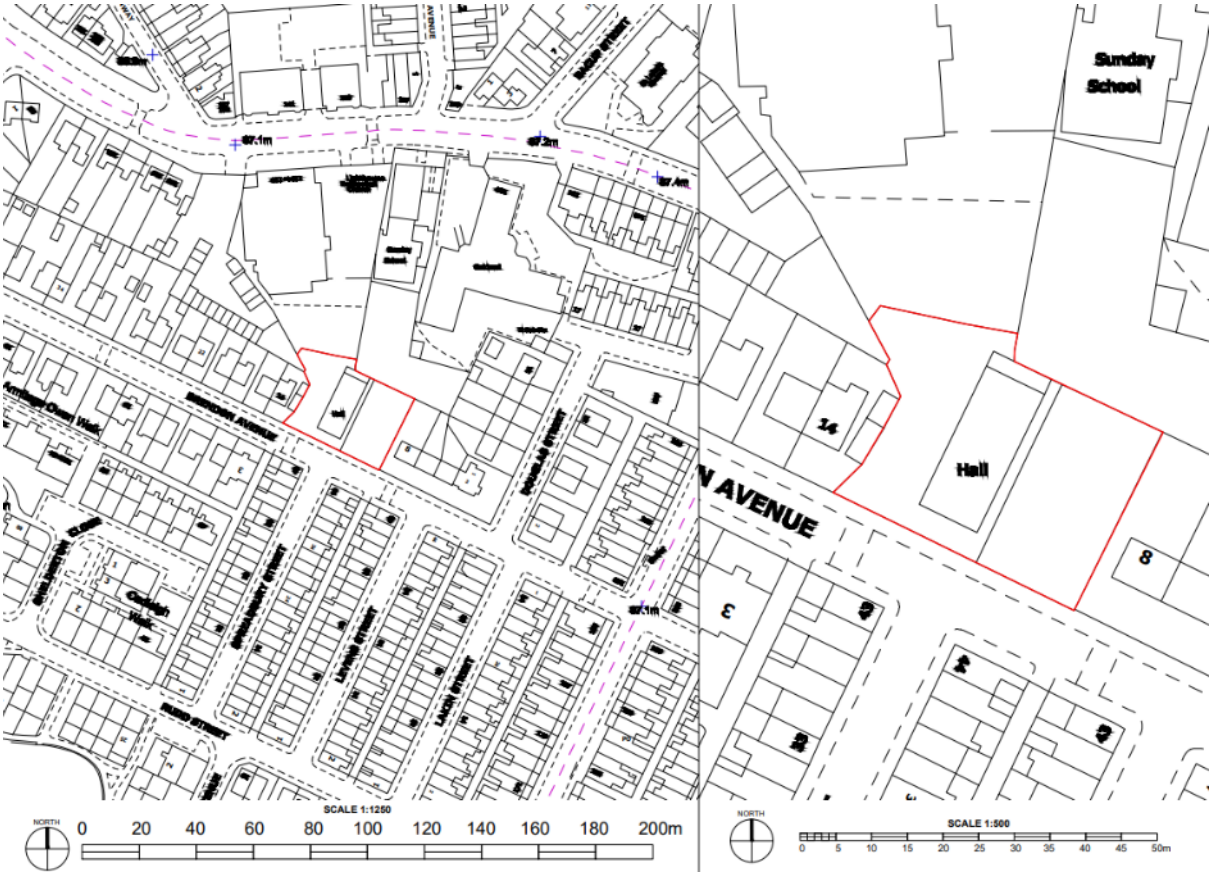
1.3 Site Location

Figure 1.1 shows the proposed site location. The site is surroundings is predominantly residential to the west, east and south. There is commercial shop to the north at around 50 meters as well as a derelict building likely to be also have had commercial usage in the past also at approximately 50 meters. Various sources of noise are likely to exist from the surrounding areas but the most predominant sources of noise that could have adverse impacts on the proposed residential units are considered to be the:

- Noise from Brendon Avenue (Traffic)
- Noise from commercial shop to the North at 50 meters (earliest opening hours 8am and latest closing hours at 5pm)
- Road noise from Kenyon Lane at 100 meters approximately 75 meters

Since the operational hours of the commercial unit is up to 5pm, it is considered that the worst-case background noise data is likely to be from a monitoring location near Brendon Avenue.

Figure 1.1: Proposed site location (image source: Client)



2. Relevant Noise Standards

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

2.1 The 'National Planning Policy Framework (NPPF)

The updated 2021 version of the 'National Planning Policy Framework (NPPF)'[1] contains information and general guidance to Local Authorities in relation to considering and taking into account noise. The National Planning Policy Framework (NPPF) guidance reinforces that noise should be taken into account considering planning policies and decisions. Some of the guidance contained in the 'National Planning Policy Framework (NPPF)' includes the following:

- Paragraph 174e: "…*preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability*…"
- Paragraph 185a,b: "*Planning policies and decisions should also ensure that new development is appropriate for its location taking into account the likely effects (including cumulative effects) of pollution on health, living conditions and the natural environment, as well as the potential sensitivity of the site or the wider area to impacts that could arise from the development. In doing so they should*:

  (a) *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life…*

  (b) *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;…*"

- Paragraph 187: *Planning policies and decisions should ensure that new development can be integrated effectively with existing businesses and community facilities (such as places of worship, pubs, music venues, and sports clubs). Existing businesses and facilities should not have unreasonable restrictions placed on them as a result of development permitted after they were established. Where the operation of an existing business or community facility could have a significant adverse effect on new development (including changes of use) in its vicinity, the applicant (or 'agent of change') should be required to provide suitable mitigation before the development has been completed.*

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

"Noise Policy Statement for England Aims:

- *The first aim of the NPSE:*

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

[1] The National Planning Policy Framework (2018/19) https://www.gov.uk/guidance/national-planning-policy-framework
[2] Noise Policy Statement for England (NSPE) https://www.gov.uk/government/publications/noise-policy-statement-for-england

- *The second aim of the NPSE:*

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

- *The third aim of the NPSE:*

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

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

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

The NPSE further states that:

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

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

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

2.2 WHO 'Guidelines for Community Noise'

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

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

The guidance goes on to provide a daytime[3] internal acoustic criteria relative to critical health effect(s) that of 35 dB $L_{Aeq,16\ hour}$, and a night-time[4] level of 30 dB $L_{Aeq,8\ hour}$ / 45 dB L_{AFmax} linked with dwelling indoors. Therefore, assuming a maximum external noise level of 50 dB $L_{Aeq,t}$

[3] daytime is typically between 07:00 h and 23:00 h.
[4] night-time is between 23:00 h and 07:00 h.

during the daytime, (considering a 15 dB reduction in noise via a partially open window) an internal noise level of 35 dB $L_{Aeq,t}$ should be achieved.

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

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

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

2.3 IEMA (Institute of Environmental Management & Assessment)

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

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

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

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

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

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

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

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

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

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

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

3. Noise Survey

3.1 Overview

This section provides the details of the methodological approach taken to assess the prevailing acoustic environment at the site where new noise-sensitive receptors (residential units) will be introduced. To establish the current acoustic environment and the monitoring of noise levels at the site, the key noise indicators namely $L_{Aeq,T}$, $L_{A90,T}$, $L_{AFmax,T}$ and $L_{A10,T}$, are used where applicable and are described in Appendix A.

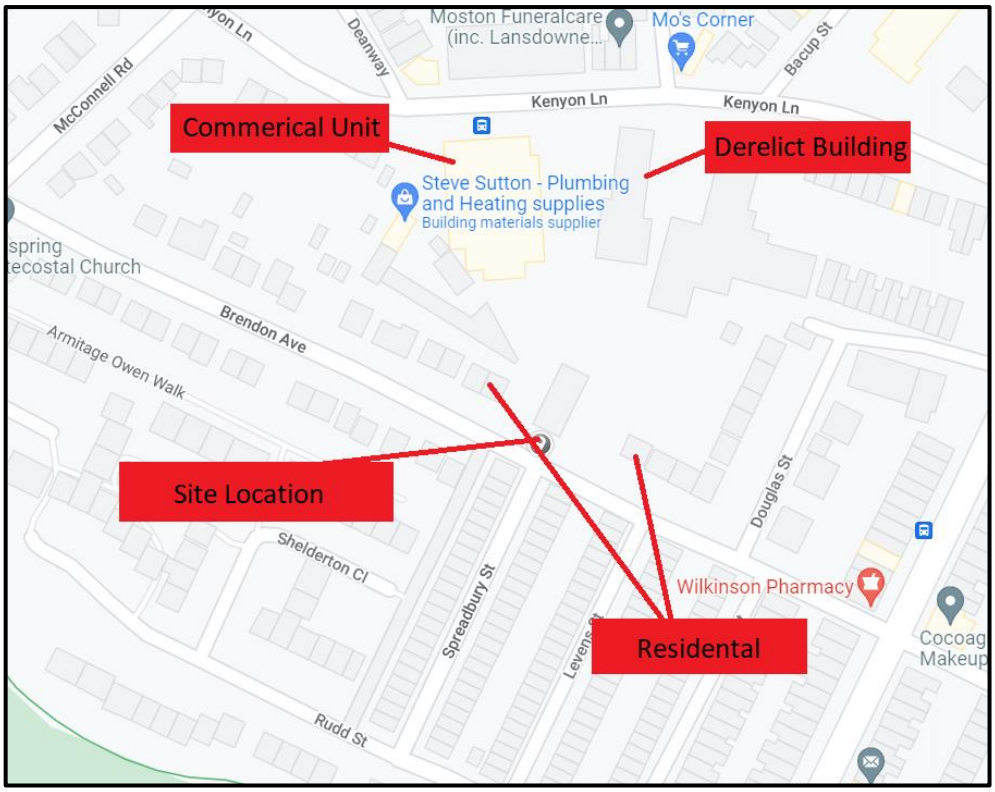
3.2 Noise Monitoring Locations

Noise, for the specific site, was monitored for specific periods for 15 min for daytime between 11:00 – 12:00, evening time between 18:00 – 19:00 and night-time between 23:00 – 00:00 at the location shown in figure 3.1. This was due to security concerns with leaving the equipment unattended at the site. These times were discussed with the local authority and were agreed upon.

The monitoring location was deemed suitable to capture the prevailing traffic noise as well as other prevailing noises in the area. The operational hours of the commercial unit is up to 5pm, it is considered that the worst-case background noise data is likely to be from a monitoring location near Brendon Avenue.

The noise data has been considered to be representative of free-field conditions due to the distance between the monitor and the building façade being more than 3.5m; therefore, no acoustic corrections have been applied. It should be noted that all measurements were also carried out as per the requirements of BS7445 and the details for the weather conditions have been presented in Section 3.5.

Figure 3.1 Noise Monitoring Location (Source: Google Maps)



3.3 Noise Survey Periods

The details of the noise survey periods have been tabulated below.

Table 3.2 Noise Survey Periods

Noise Monitoring Location	Date	Start Time	End Time
1	06/01/23	11:37	11:52
1	06/01/23	18:10	18:25
1	06/01/23	23:12	23:27

3.4 Details of Noise Monitoring Equipment

The details of the equipment used for the noise monitoring have been tabulated below. Please note that all equipment are class 1 monitors and have been calibrated before and after surveys. All equipment calibration does not exceed 2 years from the last calibrated date.

Table 3.3 Noise Equipment Details

Equipment Details		Serial Number	Last Calibrated
Monitor	BSWA 308 Class 1	590144	25/10/21
Calibrator	CA111	550282	03/08/21

3.5 Weather Conditions and Observations

Weather conditions during the survey periods were suitable for environmental noise monitoring and are not considered to significantly affect any of the results.

During the noise survey periods, the weather conditions were clear and dry with little to no wind (< 8 m/s). The temperature ranged from approximately 4°C to 6°C

4. Noise Survey Results

4.1 Ambient noise results

A summary of the daytime, evening and night-time noise results can be seen below.

Table 4.1 Summary of Noise Results at Noise Monitoring Locations 1

	Noise measured at Location 1		
Indicator All values in dB(A)	Daytime (11:37-11:52)	Evening (18:10-18:25)	Night-time (23:12-23:27)
L_{Aeq}	58	58	58
L_{A10}	61	60	58
L_{A90}	51	52	47
L_{Amax}	83	78	82

5. Noise Impact Assessment

The predicted external noise levels have been compared with the WHO and BS:8223 target internal noise levels (see Section 2 of this Report) to derive the required noise reduction of façade/windows.

The internal target levels for bedrooms are based on guidelines laid out by BS:8223

- Day-time (07.00-23.00 hrs): 35dB(A)
- Night-time (23.00-07.00 hrs): 30dB(A)

5.1 Noise Impact of External Noise on Residential Development

For this survey, the commercial noise is accounted for within the background noise.

Referring to Section 4 of this report and considering the nature of the noise from the external surroundings, the prevailing levels of noise recorded were compared to the BS8233 criteria mentioned above.

It was found that a minimum attenuation level of 58 – 35 = 23 dB is required during daytime and for the evening and a minimum attenuation of 58 - 30 = 28 dB during the night-time. It should be noted that no distance corrections were applied as the monitoring location were in free-field.

ProPG and the WHO community noise guidelines also recommend that the peak noise in bedrooms should not exceed 45 dB LAmax more than 10 times per night. ProPG, Section 2.11 mentions that if there may be more than 10 noise events at night (2300 – 0700) with $L_{Amax,F}$ > 60 dB, the site should not be regarded as having a negligible risk. It further mentions that "behavioural awakening, is likely to occur where the maximum sound level at the façade of a building with partially open windows is above:

- 85 dB $L_{Amax,F}$ (where the number of events exceeding this value is ≤ 20); or
- 80 dB $L_{Amax,F}$ (where the number of events exceeding this value is > 20)"

Based on the night-time LAmax value recorded, the proposed development cannot be defined as having a negligible risk for sleep disturbance. Based on the L_{Amax} values recorded and to provide a robust assessment and it was found that a minimum attenuation level of 82 – 45 = 37 dB is required to meet the above mentioned Pro Pg and WHO criteria.

Therefore, on the overall, a minimum noise attenuation of 37 dB(A) is required for all the building facades.

The amenity area at the rear of the purposed site is required to have a maximum noise level of 55 dB. The amenity area is approximately 15 meters away from the monitoring location, and is calculated with distance correction formula below:

$P_2 = P_1 – 20 \log(R_1/R_2)$

Where P_1 is the current noise level, R_1 is the distance to the receptor, R_2 is the distance from the source. R_2 is calculated to be 1m, at the source.

The noise at the amenity area is calculated to be 34 dB, hence no mitigation measure is required. Please note, the residential building itself will act as a barrier for the noise hence it is expected to be lower.

6. Proposed Mitigation Measures

Mitigation measures need to be in place to minimise the potential negative impacts in order to ensure that the internal noise limits are achieved, we would recommend the following scheme of mitigation measures as outlined below.

6.1 Non-Glazed Elements

It is currently understood that the non-glazed building façade elements of the proposed residential development would be comprised of masonry. To ensure robust mitigation, it is proposed that all external non-glazed elements of the building façade should be able to provide a sound reduction performance of at least 37 dB as deduced in section 5 of this report. This should be easily achieved as part of the design since the minimum acoustic performance required by the separating walls for purpose-built dwellings is 45dB (according to Part E of the Building Regulations 2010).

6.2 Glazed Elements

Since the proposed development is classified as a listed building, it is proposed that secondary glazing with a minimum acoustic performance of 37 dB(A) should be implemented. It will be ensured that 37 dB(A) is representative and equivalent to the R_w +C_{tr} acoustic performance value of the chosen glazed element. Examples showing the performance of such glazed elements have also been provided in Appendix C.

6.3 Ventilation Strategy

6.3.1 Passive and Mechanical

Based on the findings in Sections 4 and 5 of this report, the internal noise levels with open windows were evaluated as 58 - 15 = 43 dB during the day-time and 58 - 15 = 43 dB during night-time (assuming a partially open window attenuates 15dB as mentioned in BS8233).

In conjunction with the Acoustics and Ventilation Residential Design Guide 2020, the proposed development was found to have a high risk during daytime and a high risk during night-time.

In consideration of the above information, it is proposed that the use of acoustic trickle vents with attenuation characteristics ≥ 43 dB, $D_{n,e,w.}$ can be implemented as a continuous ventilation strategy and the required internal BS8233 noise criteria (refer to Section 5 of this report) will in turn be achieved with closed windows and open windows can be used for a rapid purge.

All ventilation installation should be performed by qualified personnel who will ensure that conditions such as infiltration rates etc are being complied with as per Building Regulations part F.

6.4 Construction Phase Mitigation Measures

6.4.1 Noise

The effects of noise can vary from a person to person. The negative impacts include a sensation of loudness, potential interference with speech communication, disturbance of work or leisure, and disturbance of sleep. It should be noted that within any neighbourhood, some individuals will be more sensitive to noise than others.

In order to assess instantaneous noise levels at any time, the instantaneous A-weighted sound pressure level, L_{pA} can be used. This will give an indication of the loudness and degree of speech interference from noise.

The most commonly used descriptor, however, is the equivalent continuous A-weighted sound pressure level, $L_{Aeq,T}$. The time period involved should always be stated as the figure is a mathematical average of all individual contributions of various sources during the reference period T. When assessing noise from individual events that may not always be present during a longer period L_{Aeq}, it can be useful to use a short reference period (e.g. 5min). As an alternative descriptor, the maximum sound pressure level, $L_{A(max)}$, or the one percentile level, L_{A01}, may be used.

Concerning noise levels, it is proposed that the absolute limit would be determined in accordance with BS5228-1:2009 and would be subject to an overall daytime noise limit of 75dB L_{Aeq}.

6.4.2 Vibration

The sensitivity of the human frame to vibration varies according to the axis of vibration relative to the human body (e.g. x, y, or z-axis) and the frequency of vibration. In general, except at very low frequencies, sensitivity is greater in the z-axis (i.e. head to foot). When setting vibration control targets it is reasonable to assume that people will normally be sitting or standing during the day and lying down during the night.

With an impulsive source of vibration, it is usual to measure the peak value attained from the beginning to the end of a drive. It is also usual to measure in terms of peak particle velocity (P.P.V) if the risk of damage to the building is the primary concern and there is also an interest in human reaction. If the concern is purely for human tolerance, then acceleration is the preferred parameter.

Vibrations, even of very low magnitude, may be perceptible to people and can interfere with the satisfactory conduct of certain delicate activities, e.g. operating theatres, use of very sensitive laboratory weighing equipment, etc.

Nuisance from vibration is frequently associated with the assumption that, if vibrations can be felt, then damage is consequently inevitable; however, considerably greater levels of vibration are required to cause damage to buildings and structures than to be perceived by the human body.

Vibrations from site activities to the neighbourhood may, therefore, cause anxiety as well as annoyance and can disturb sleep, work, or leisure activities. As with noise, in any neighbourhood, some individuals will be more sensitive to vibration than others.

6.4.3 Noise and Vibration Monitoring Technology

The following factors are typically used to assess the likelihood of disturbance caused by noise and vibration generating activities.

- Site location

The relative location of a site in relation to noise or vibration-sensitive receivers will be a determining factor. The closer a site is to sensitive premises, the higher the likelihood of complaints due to noise and vibration emanating from the site.

- Ambient noise and vibration levels

It is understood that the site surrounding is generally representative of a typical busy urban mixed-use adjacent to an ‘A’ road. The ambient noise and vibration are predominantly related to the existing road traffic movement.

- Duration of site operations

In general, the longer the duration of all on-site operations, the more likely it is that noise or vibration from the site will potentially be an issue. In this respect, good public relations are very important. Local residents may be willing to accept a new status of noise and vibration if they know and understand the source and the duration of all operations. Therefore, all site operations are to be carried out according to a stated schedule. Changes are to be notified to the local authority in advance.

- Hours of work

For any noise-sensitive premises, some periods of the day will be more sensitive than others. Times of site operation outside normal weekday working hours will also need consideration.

Noise control targets for the evening period in such cases will need to be stricter than those for the daytime and, when noise limits are set, the evening limit may have to be as low as 10 dB(A) below the daytime limit. Very strict noise control targets should be applied to any site which is to operate at night.

- Site Operation

People's attitudes to noise are always influenced by their attitudes to the noise source itself. Noise and vibration generated from a site will tend to be accepted more willingly by local residents if they consider that the site operator is adopting the best practicable means to avoid unnecessary noise.

- Noise and vibration characteristics

In many cases, the particular identity of noise and vibration will affect people's judgement and appreciation of the signal itself. For example, the presence of a high-amplitude impulsive noise, accompanied by a vibration sensation would render the overall assessment slightly more onerous as "penalties" would need to be employed. These would comprise weightings to signals (e.g. 5dB (A) to a highly tonal or intermittent noise source).

6.4.4 Proposed Control Measures for Construction Noise

The contractor to ensure The Best Practicable Means (BPM) (as defined in Section 72 of the Control of Pollution Act 1974) will be used to reduce noise and vibration levels at all times. Where practicable the control measures set out in BS 5228:2009 + A1:2014 Part 1 & Part 2, Section 8 will also be implemented.

The following noise and vibration control measures to be included as a minimum:

- Choice of methodology/technique for operations (including site layout) will be considered in order to eliminate or reduce emissions at sensitive locations;
- Fixed items of construction plant will be electrically powered in preference to diesel or petrol-driven;
- If any specialise fabrication is required, this will be undertaken off-site if possible;
- Noisy plant will be kept as far away as possible from sensitive areas;
- Each item of the plant used will comply with the noise limits quoted in the relevant European Commission Directive 2000/14/EC/United Kingdom Statutory Instrument (SI) 2001/1701 where reasonably available;

- Equipment will be well-maintained and will be used in the mode of operation that minimizes noise and shut down when not in use;
- Vehicles shall not wait or queue on the public highway with engines running (unless the engine is required to power the operation of the vehicle e.g. concrete wagon);
- Where possible deliveries will be arranged on a just-in-time basis to prevent vehicles from queuing outside of the site and
- All materials will be handled in a manner that minimizes noise.

6.4.5 Temporary Noise Barrier or Noise Insulation

Table E2 of BS 5228-1:2009+A1:2014 provides an example of time periods, averaging times, and noise levels associated with the determination of eligibility for noise insulation.

Noise insulation, or the reasonable costs thereof, will be offered by the developer or promoter to owners, where applied for by owners or occupiers, subject to meeting the other requirements of the proposed scheme, where the construction of the development causes, or is expected to cause, a measured or predicted airborne construction noise level that exceeds either of the following at property lawfully occupied as a permanent dwelling: the noise insulation trigger levels presented in Table E.2 for the corresponding times of day; and a noise level 5 dB or more above the existing pre-construction ambient noise level for the corresponding times of day; whichever is the higher; and for a period of 10 or more days of working in any 15 consecutive days or for a total number of days exceeding 40 in any 6 consecutive months."

Table 6.1: An extract from BS Standard (Table E2 of BS 5228-1:2009+A1:2014)

Examples of time periods, averaging times and noise levels associated with the determination of eligibility for noise insulation

Time	Relevant time period	Averaging time, *T*	Noise insulation trigger level dB $L_{Aeq,T}$ [A)]
Monday to Friday	07.00 – 08.00	1 h	70
	08.00 – 18.00	10 h	75
	18.00 – 19.00	1 h	70
	19.00 – 22.00	3 h	65
	22.00 – 07.00	1 h	55
Saturday	07.00 – 08.00	1 h	70
	08.00 – 13.00	5 h	75
	13.00 – 14.00	1 h	70
	14.00 – 22.00	3 h	65
	22.00 – 07.00	1 h	55
Sunday and Public Holidays	07.00 – 21.00	1 h	65
	21.00 – 07.00	1 h	55

A) All noise levels are predicted or measured at a point 1 m in front of the most exposed of any windows and doors in any façade of any eligible dwelling.

6.4.6 Proposed Vibration Control Measures

This section presents an assessment of the potential risk regarding vibration generated by the construction works detailed in this document and the associated adverse effects on the surrounding area.

Estimated vibration levels have been evaluated against guidance presented in relevant British Standards to assess the likelihood of both structural damages to neighbouring buildings and the human response of the occupants.

Building Damage

According to BS 7385 Part 2 for residential or light commercial buildings, the threshold for the onset of potential cosmetic damage (i.e. formation of hairline cracks on drywall surfaces or the growth of existing cracks in plaster or drywall surfaces) to buildings varies with frequency. This ranges from a PPV of 15 mm/s at 4Hz, rising to 20mm/s at 15 Hz, and to 50 mm/s at and above 40Hz for transient vibration. BS 7385: Part 2 also states that the probability of building damage tends towards zero at 12.5 mm/s peak component particle velocity.

Subjective Response

According to guidance provided in BS 5228 Part 2, the threshold of vibration perceptible to humans lies around 0.14 to 0.3 mm/s. The Standard also indicates that a PPVs of around 1 mm/s in residential environments, as a first estimate, are likely to cause complaints, but can be tolerable provided prior warning and explanation of the works is given to residents; whilst, vibration magnitudes of around 10 mm/s are likely to be intolerable for more than a very brief exposure to this level.

As the exact equipment that will be used during the construction phase is not known, we propose the following criteria:

- 5 mm/s p.p.v. ‘soft’ limit; when exceeded, the contractor should temporarily halt works. Works should only be resumed after consultation with the local residents, and with extreme caution and
- 10 mm/s p.p.v. ‘hard’ limit; when exceeded, the contractor should stop work. Works should only continue after a thorough structural examination of the adjacent property, subsequent consultation with the local residents, and then with extreme caution. Should significant damage be identified, alternative methods of land remediation operations should be adopted.

6.4.7 Noise and Vibration Monitoring Equipment

A class 1 continuous noise monitor is proposed for the duration of the monitoring period. The location of the monitor should be placed to the site boundary adjacent to the nearest receptor located at the south of the proposed development.

For the vibration monitor, it is proposed that a suitable ground vibration monitor to be installed for the duration of the construction period.

A continuous alarm system will operate to ensure the site manager is alerted when the trigger level is exceeded.

6.5 Residual Impact

6.5.1 Construction Phase

Following the implementation of mitigation measures in accordance with the BS 5228-1 & 2 guidance, the residual impact is considered negligible. The construction management plan will reaffirm that the construction operations shall be limited to the following days and hours:

- 08:00 to 18:00hrs Monday to Friday;
- 08:00 to 13:00hrs Saturday;
- No construction operations on Sundays or public holidays;
- HGV movements shall not be permitted outside these hours during the construction phase without prior written approval from the Local Planning Authority; and
- Installation of equipment on-site shall not be permitted outside these hours without prior written approval from the Local Planning Authority.

7. Conclusions

An environmental noise survey has been undertaken for the proposed development at Land on Brendon Avenue, Moston, M40 9DN, allowing the assessment of daytime and night-time levels likely to be experienced by the proposed development.

The development benefits from being in a residential area and therefore considered to be appropriate for residential usage with adequate acoustic design as recommended in this report. The predominant noises are considered to be from traffic noises with some commercial activity north of the development.

Predicted noise levels allowed a robust noise insulation proposal to be made to comply with a minimum value for required attenuation, which would, in turn, provide internal noise levels for all residential environments of the development commensurate to the relevant design standard. Based on the report, all glazed and non-glazed elements of the building will be required to meet 37 dB of noise attenuation.

Noise levels at the amenity area for the site is calculated to be 34 dB and hence no mitigation measures are required.

Mitigation measures have also been provided for the construction phase as per BS5228.

No further mitigation measures should be required in order to protect the proposed habitable spaces from external noise intrusion.

It can, therefore, be concluded that the proposed development is not considered to conflict with any national, regional, or local noise planning policy.

Appendices

Appendix A: Noise Indicators and Acoustic Terminology
Appendix B: Site Drawings
Appendix C: Proposed Mitigation

Appendix A: Noise Indicators and Acoustic Terminology

Decibel scale - dB

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

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

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

Octave Bands

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

Reference Time Interval, T

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

$L_{Aeq,T}$

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

$L_{A10,T}$

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

L_{Amax}

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

L_{den}

The Lden (Day Evening Night Sound Level) or CNEL (Community Noise Equivalent Level) is the average sound level over a 24 hour period, with a penalty of 5 dB added for the evening hours or 19:00 to 22:00, and a penalty of 10 dB added for the nighttime hours of 22:00 to 07:00.

L_{night}

The A-weighted, Leq (equivalent noise level) over the 8 hour night period of 23:00 to 07:00 hours, also known as the night noise indicator.

L_{A90}

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

Addition of noise from several sources

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

Attenuation by distance

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

Subjective impression of noise

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

Change in sound level (dB)	Change in perceived loudness
1	Imperceptible
3	Just barely perceptible
6	Clearly noticeable
10	About twice as loud

Transmission path(s)

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

Ground-borne vibration

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

Sound insulation - Absorption within porous materials

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

Appendix B: Site Drawings

Appendix C: Proposed Mitigation

Appendix A: Noise Indicators and Acoustic Terminology

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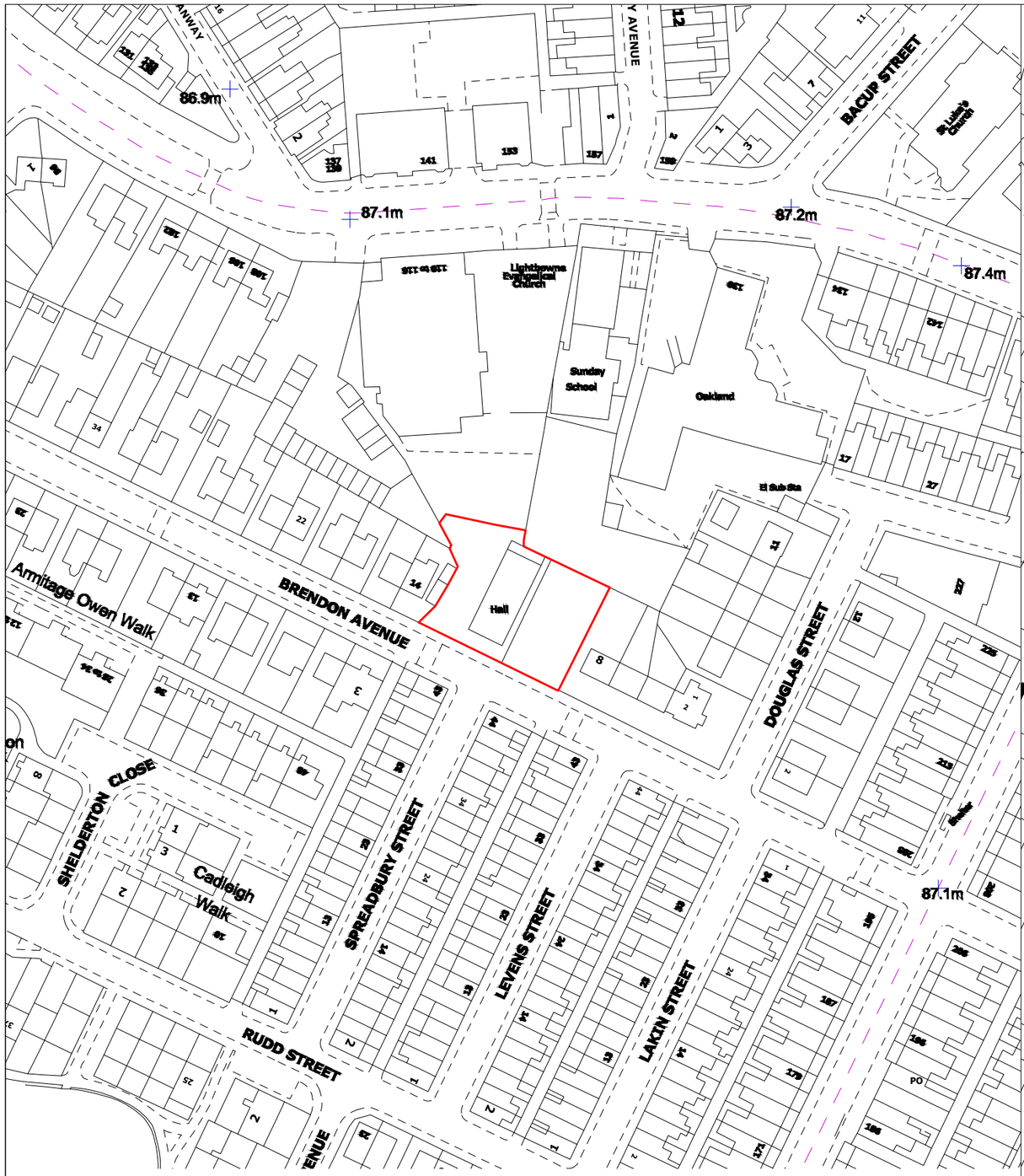
Appendix B: Site Drawings



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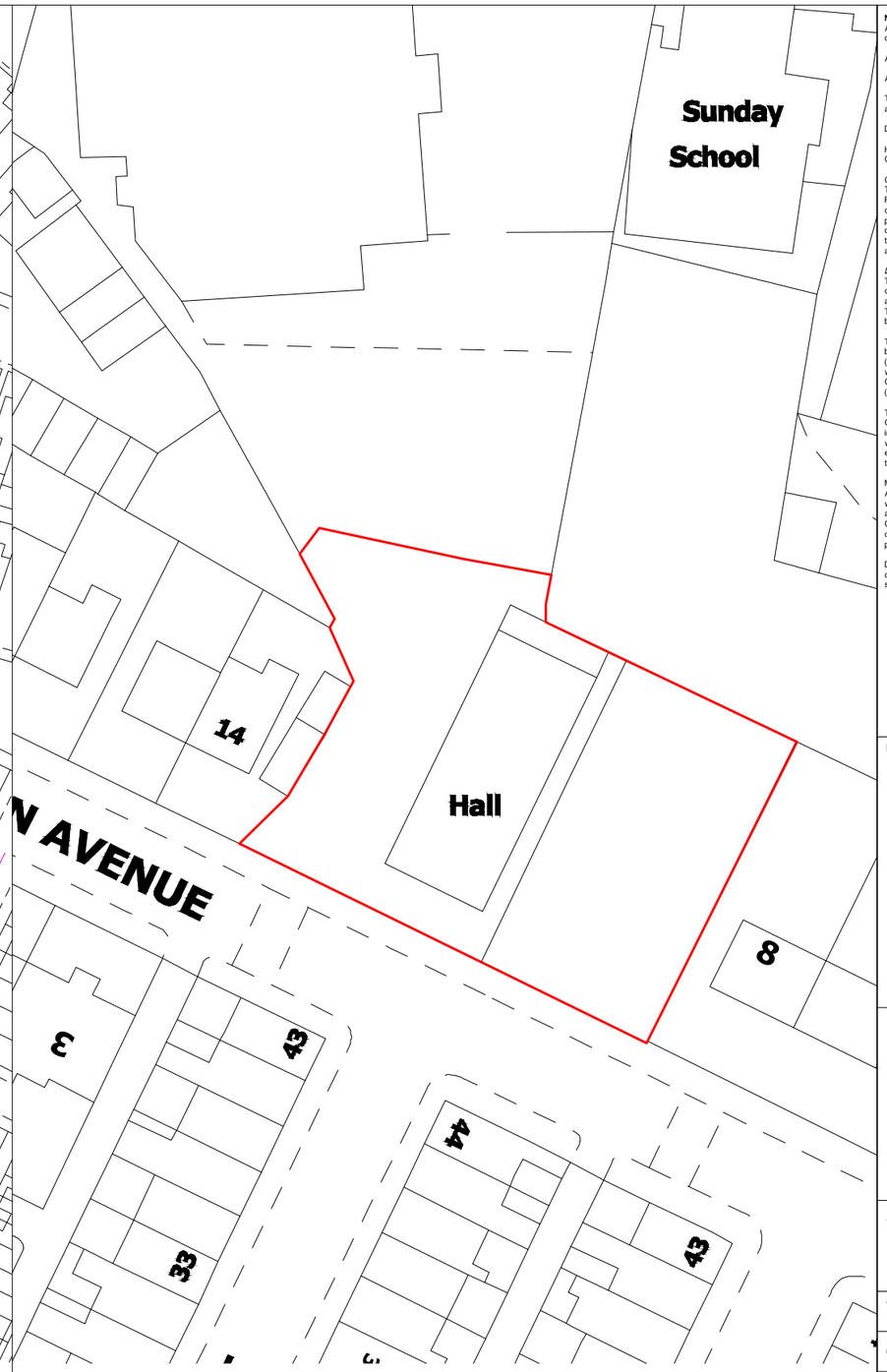

NORTH

SCALE 1:500

0 5 10 15 20 25 30 35 40 45 50m

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

The Health and Safety Executive is to be notified as soon as possible before construction work starts if the works:
(a) Last longer than 30 working days and has more than 20 workers working simultaneously at any point in the project.
Or:
(b) Exceeds 500 person days.

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

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

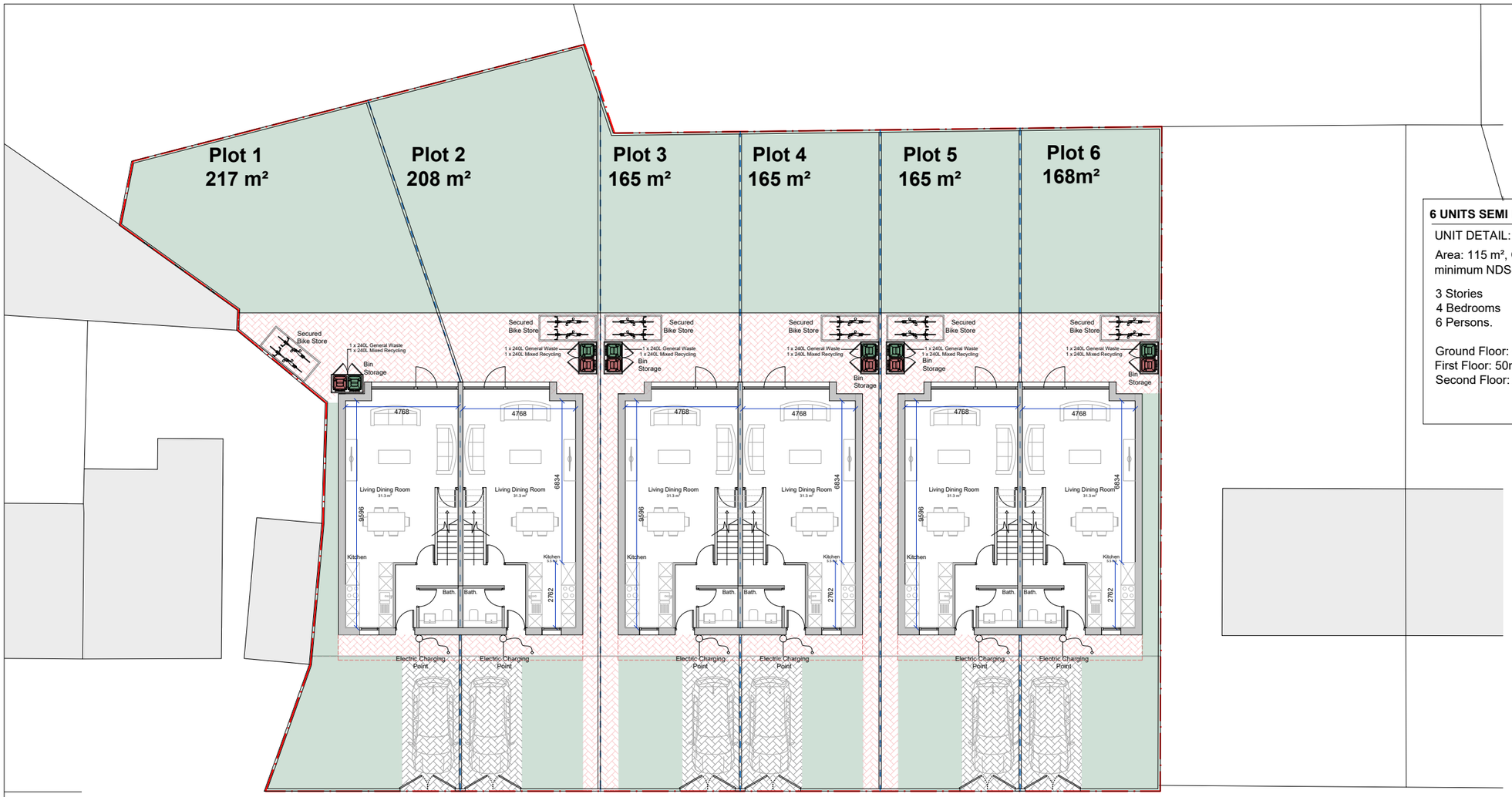
Drawings not yet checked internally or by building control, external consultants input required including a structural engineer, all drawings are subject to change and must not be relied upon at this stage.

Revisions List:

HAD & Co.
www.hussainarchitecture.co.uk
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: Location and Site Plan	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 13-04-2022	**Paper:** A3
Drawing No: HAD3412-01	**Scale:** 1:200
Revision:	



Proposed Ground Floor

6 UNITS SEMI DETACHED

UNIT DETAIL:

Area: 115 m², Comply with minimum NDSS 112 m²

3 Stories
4 Bedrooms
6 Persons.

Ground Floor: 45m²
First Floor: 50m²
Second Floor: 20m²

Notes:
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Revisions List:

a- Dimensions and areas have been added, the dwellings are comply with NDSS.

b- Updated plans with the rear bin storage and bike store.

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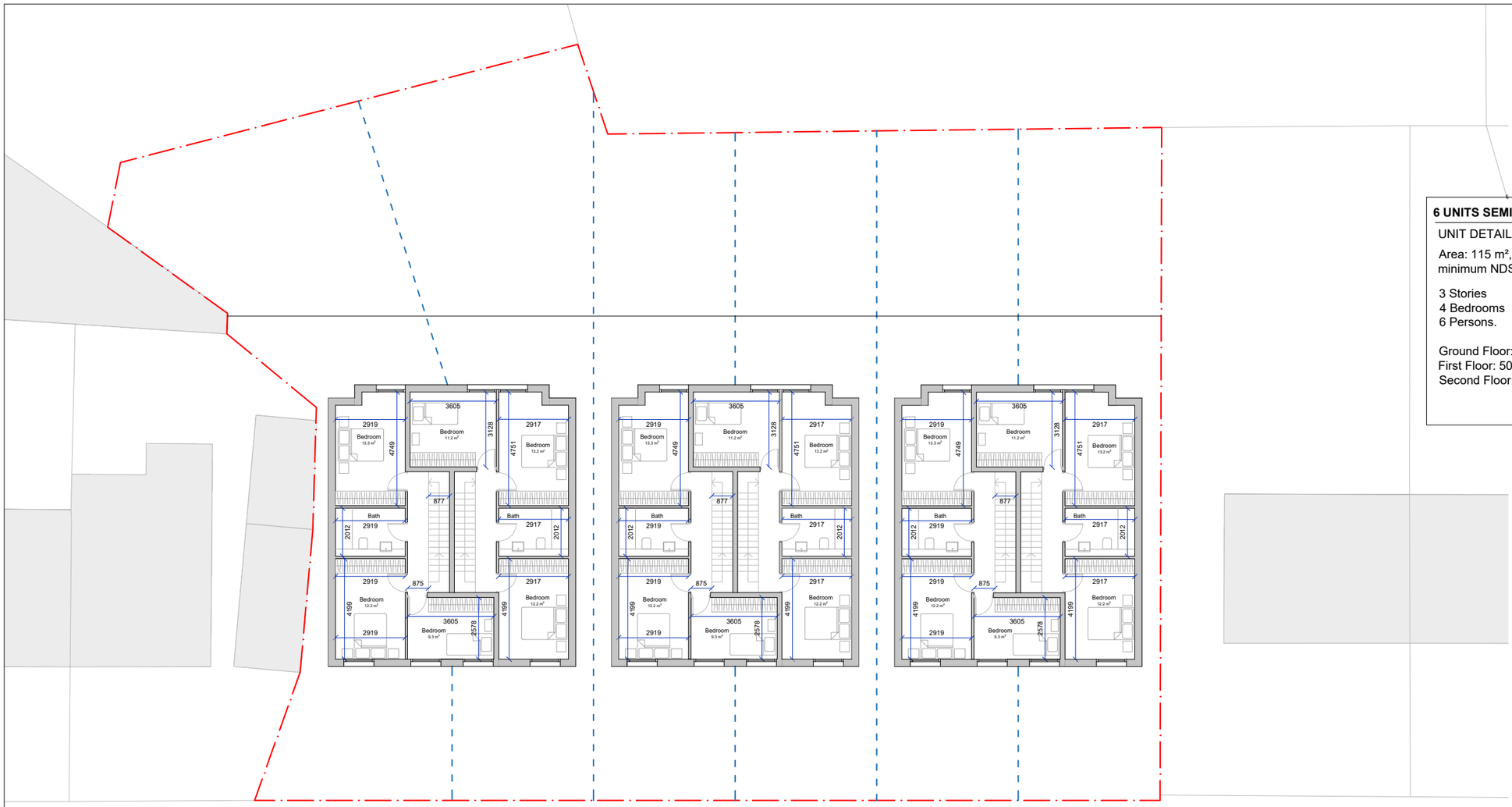
Address: Brendon Avenue
Moston
M40 9DN

Title: Proposed Ground Floor Plan	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 4-10-2022	**Paper:** A3
Drawing No: HAD3412-02	**Scale:** 1:200
Revision: a b	



6 UNITS SEMI DETACHED

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3 Stories
4 Bedrooms
6 Persons.

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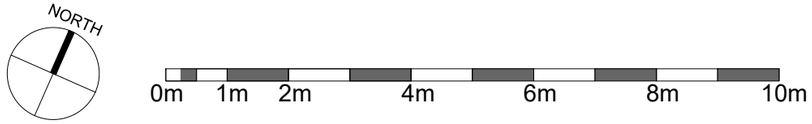
First Floor: 50m²
Second Floor: 20m²

Proposed First Floor



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Revisions List:

a- Dimensions and areas have been added, the dwellings are comply with NDSS.

HAD & Co.
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01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: Proposed First Floor Plan	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 12-09-2022	**Paper:** A3
Drawing No: HAD3412-03	**Scale:** 1:200
Revision: a	

6 UNITS SEMI DETACHED

UNIT DETAIL:

Area: 115 m², Comply with minimum NDSS 112 m²

3 Stories
4 Bedrooms
6 Persons.

Ground Floor: 45m²
First Floor: 50m²
Second Floor: 20m²

Proposed Second Floor

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Revisions List:

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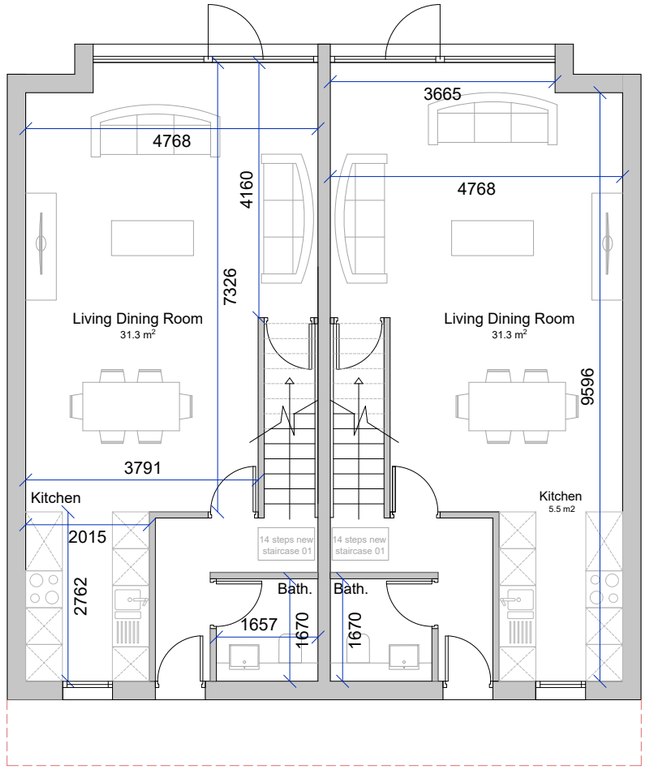
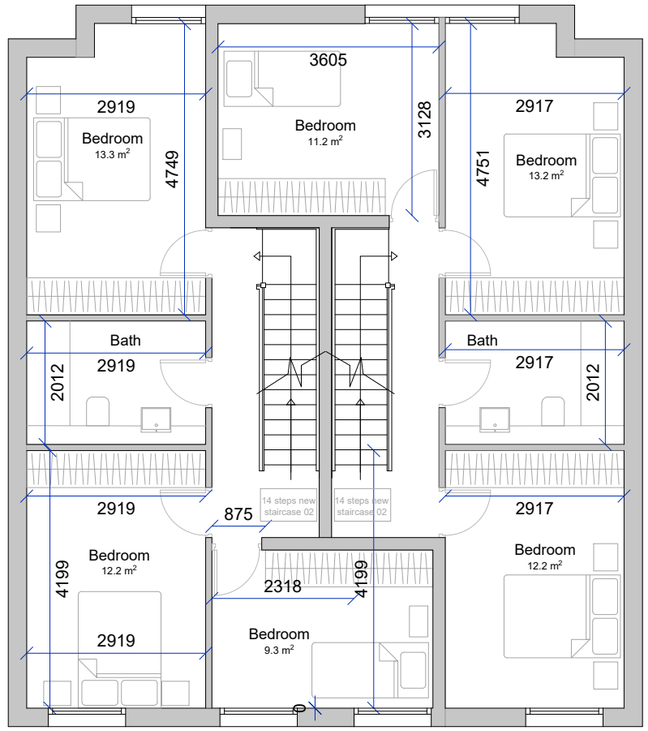
Address: Brendon Avenue
Moston
M40 9DN

Title: Proposed Second Floor Plans	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 12-09-2022	**Paper:** A3
Drawing No: HAD3412-04	**Scale:** 1:200
Revision: a	



Proposed Ground Floor



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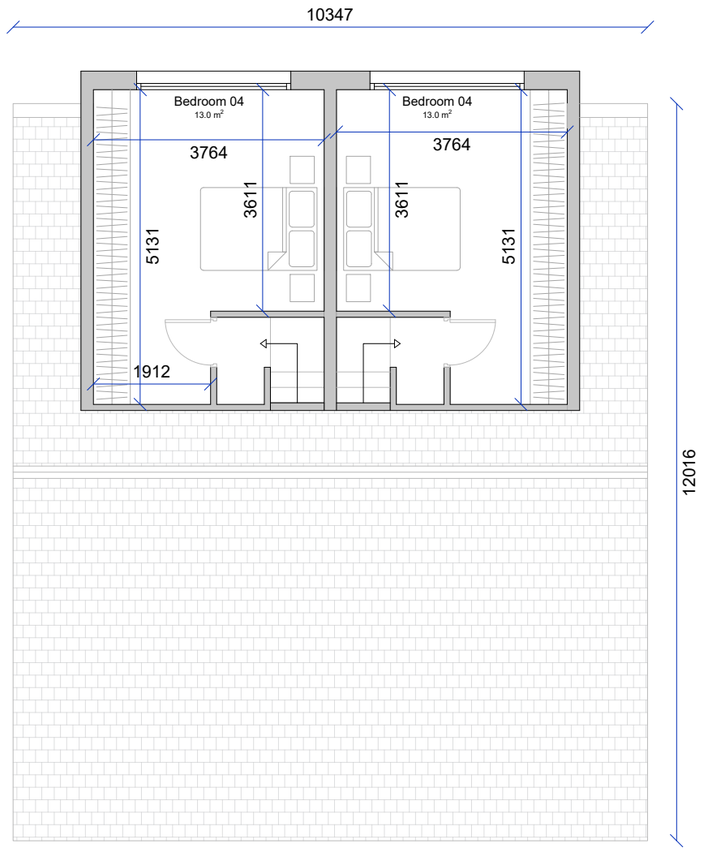

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Address: Brendon Avenue
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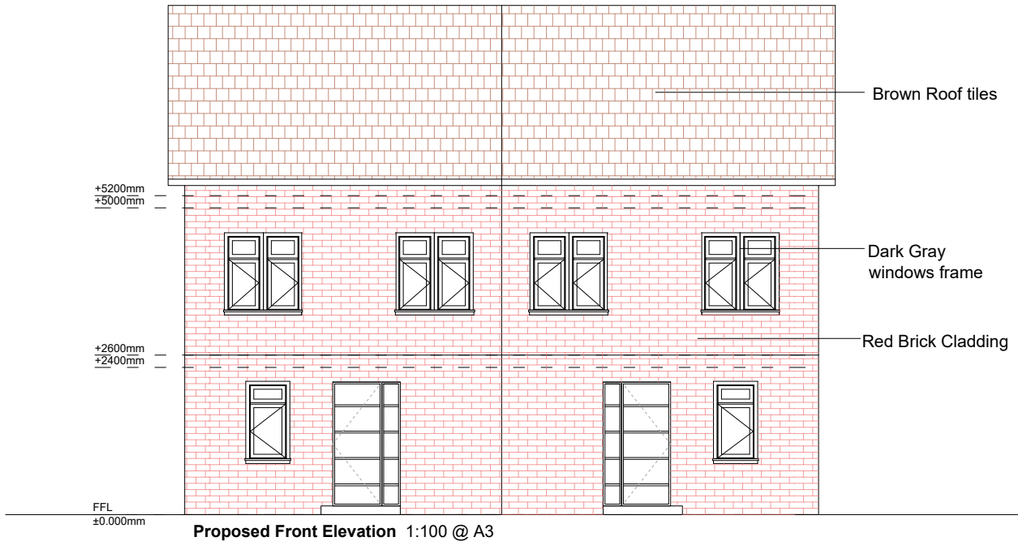
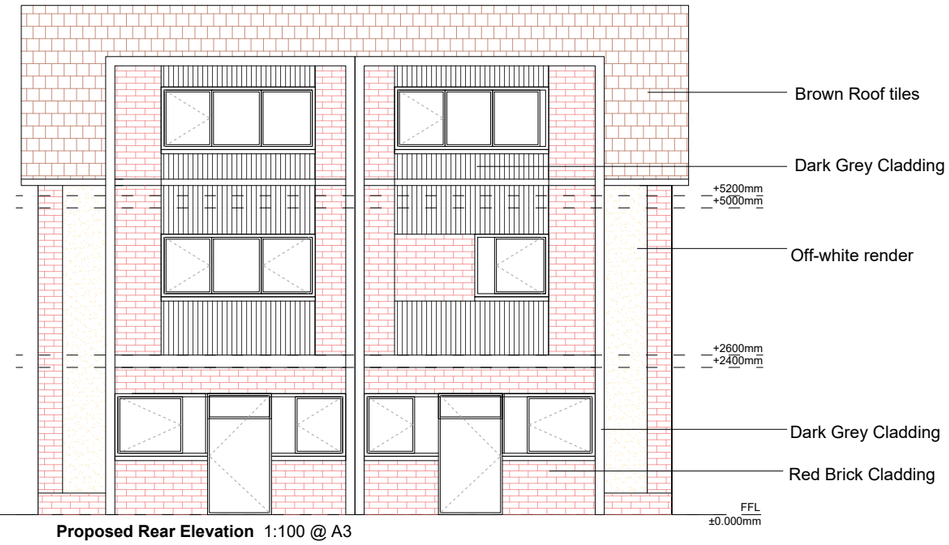
M40 9DN

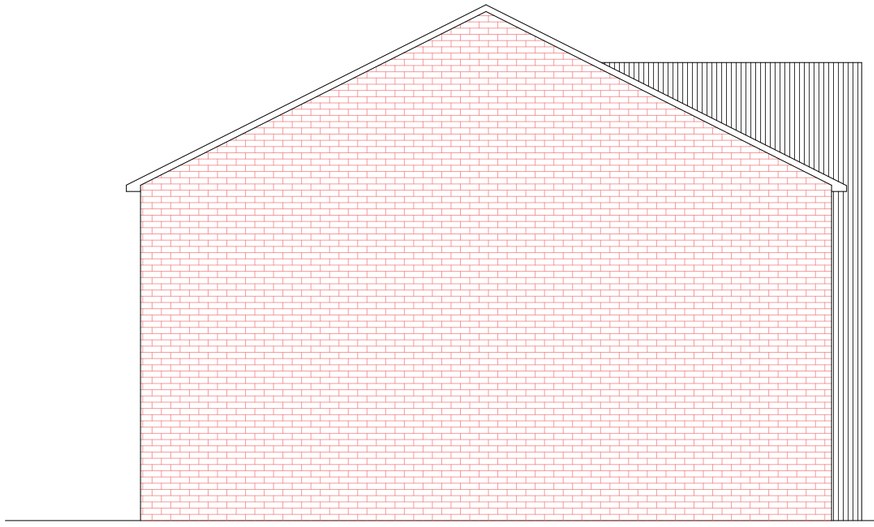
Title: Proposed Semi Detached House Plans	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 12-09-2022	**Paper:** A3
Drawing No: HAD3412-05	**Scale:** 1:100
Revision: a	



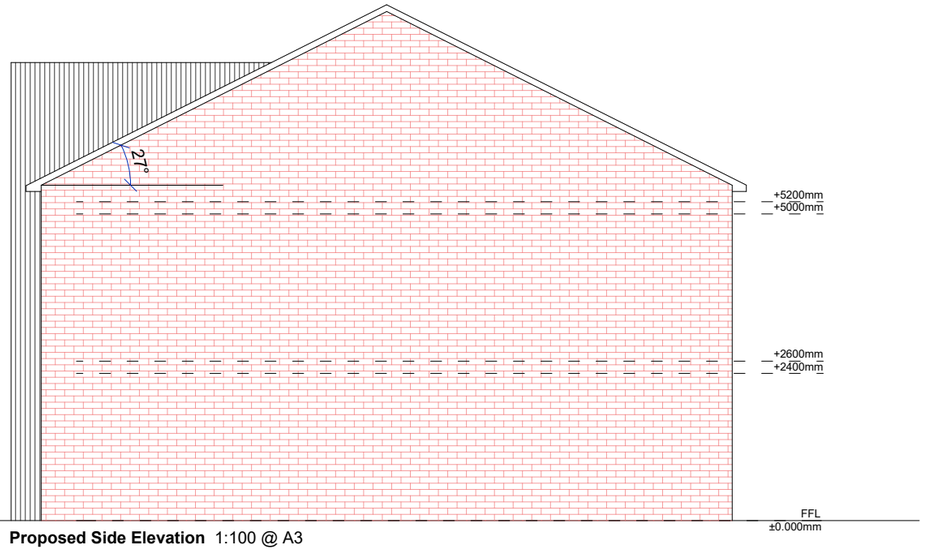
Proposed Front Elevation 1:100 @ A3
Option 01



Proposed Rear Elevation 1:100 @ A3
Option 01



Proposed Side Elevation 1:100 @ A3



Proposed Side Elevation 1:100 @ A3

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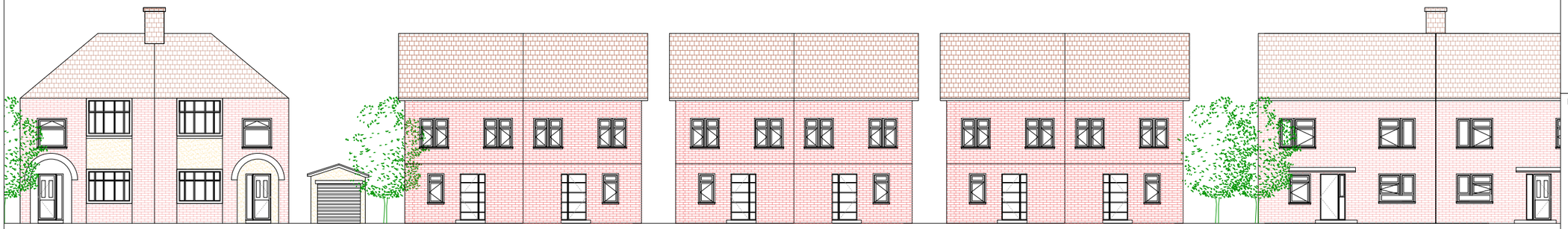
Revisions List:

HAD & Co.
www.hussainarchitecture.co.uk
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: Proposed Elevations	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 13-04-2022	**Paper:** A3
Drawing No: HAD3412-06	**Scale:** 1:100
Revision:	



Proposed Street Scene Elevations

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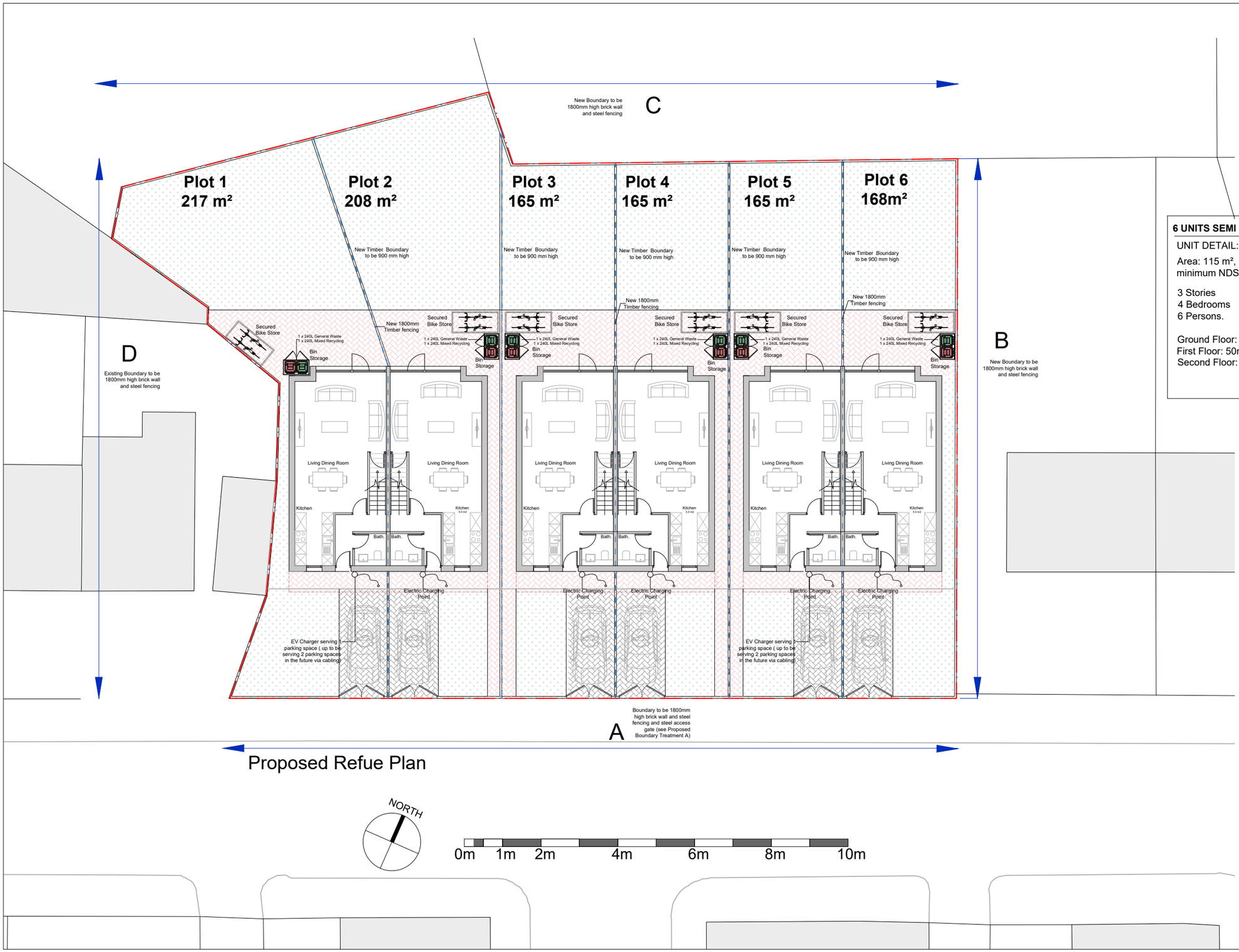
Revisions List:

HAD & Co.
www.hussainarchitecture.co.uk
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: Street Scene Elevations	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 13-04-2022	**Paper:** A3
Drawing No: HAD3412-07	**Scale:** 1:200
Revision:	



Proposed Refue Plan

6 UNITS SEMI DETACHED

UNIT DETAIL:

Area: 115 m², Comply with minimum NDSS 112 m²

3 Stories
4 Bedrooms
6 Persons.

Ground Floor: 45m²
First Floor: 50m²
Second Floor: 20m²

Notes:
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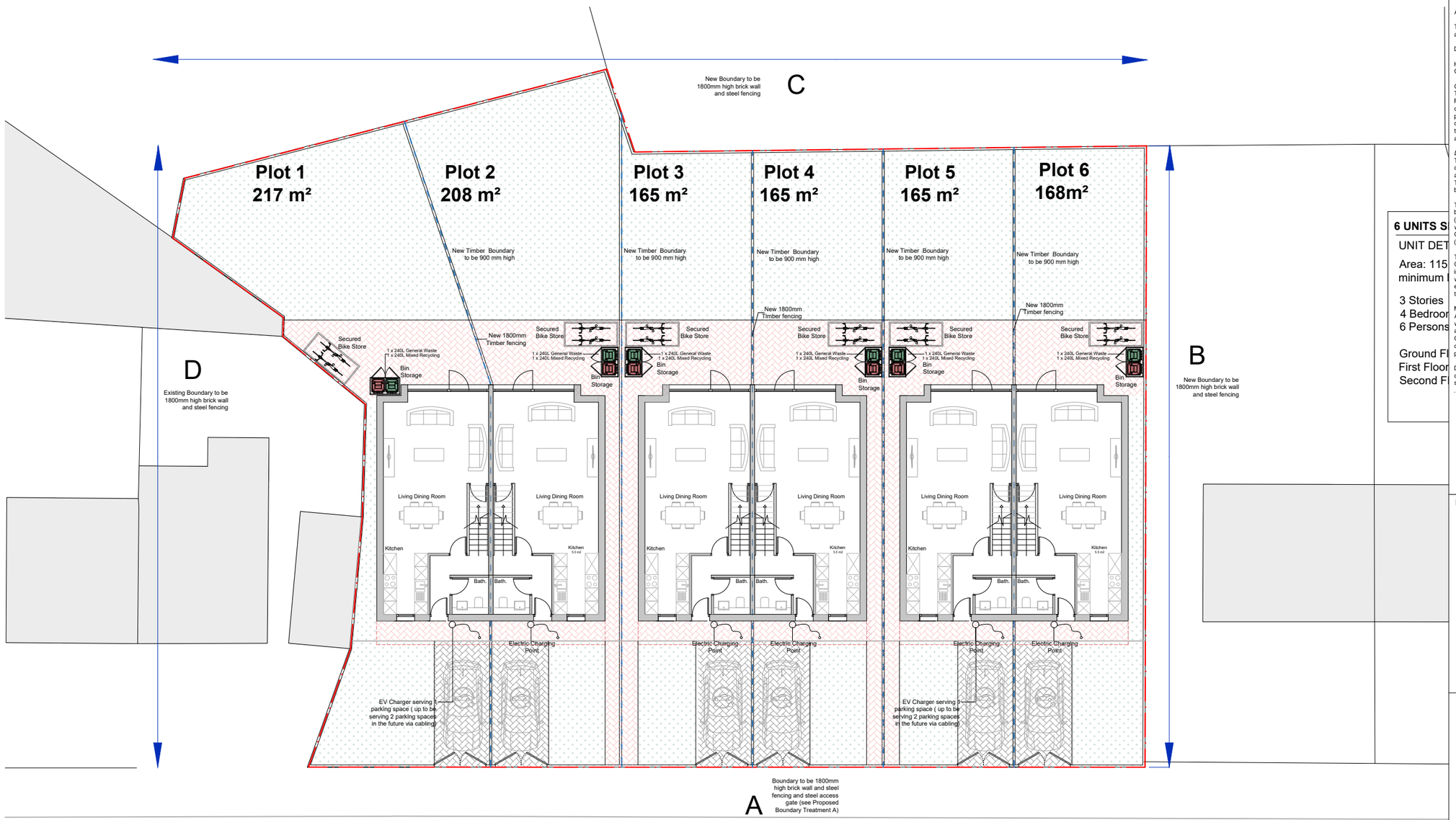
Revisions List:

a- Bin storage and Bike store have been moved to the rear.

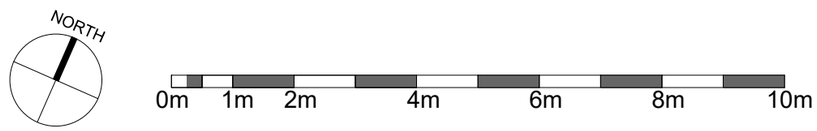
HAD & Co.
www.hussainarchitecture.co.uk
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: Refuse Plan	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 4-10-2022	**Paper:** A3
Drawing No: HAD3412-08	**Scale:** 1:200
Revision: a	



Proposed Refue Plan



6 UNITS S

UNIT DET

Area: 115
minimum

3 Stories
4 Bedroo
6 Persons

Ground F
First Floor
Second F

Notes:
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Revisions List:

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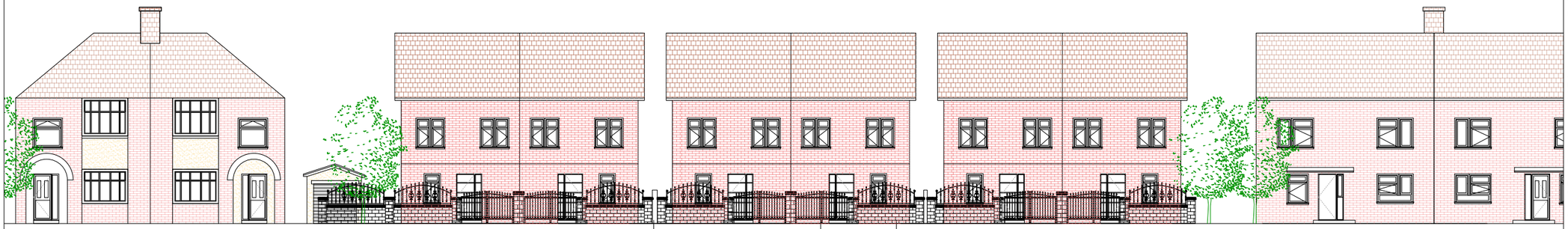
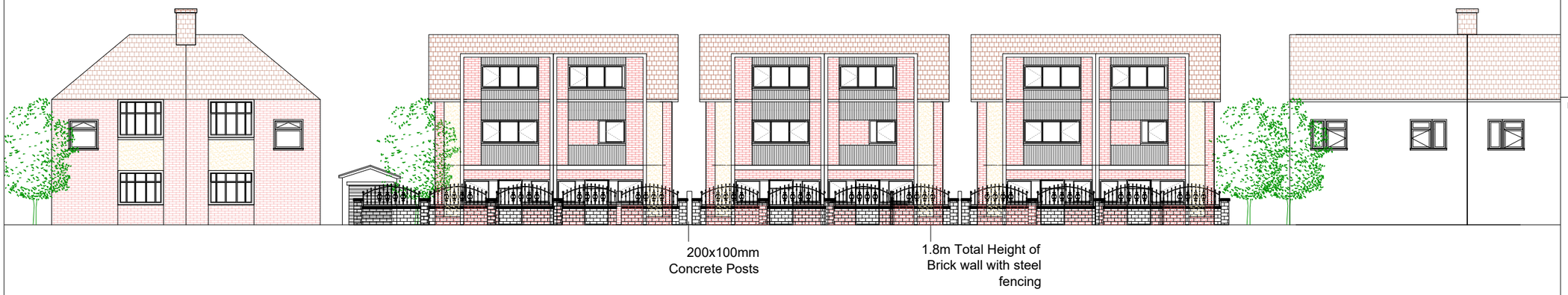
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

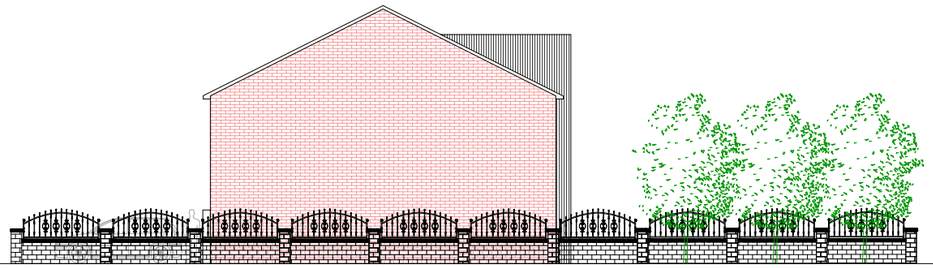
Title: Proposed Site Plan	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 22-07-2022	**Paper:** A3
Drawing No: HAD3412-09	**Scale:** 1:200
Revision:	



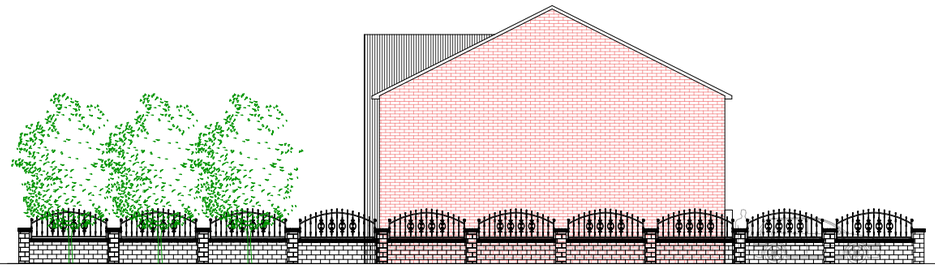
Proposed Street Scene (Boundary Treatment A)



Proposed Street Scene (Boundary Treatment C)



Proposed Street Scene (Boundary Treatment B)



Proposed Street Scene (Boundary Treatment D)

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Revisions List:

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Address: Brendon Avenue
Moston
M40 9DN

Title: Boundary Treatment A	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 22-07-2022	**Paper:** A3
Drawing No: HAD3412-10	**Scale:** 1:200
Revision:	

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Basic surface water plans, will need to be confirmed by a drainage consultant at a later date.

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Revisions List:

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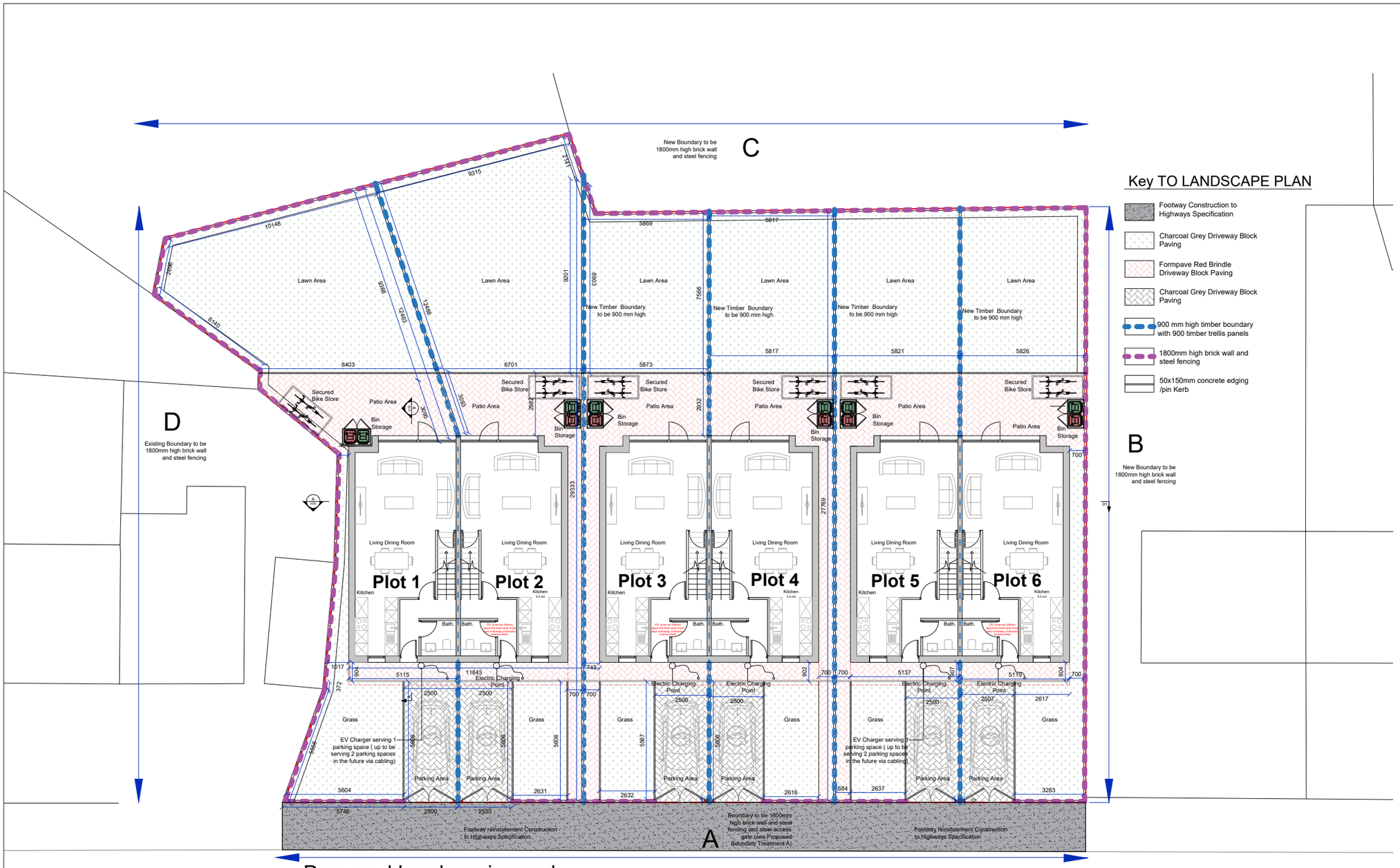
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: Surface Water Drainage Plans	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 22-07-2022	**Paper:** A3
Drawing No: HAD3412-11	**Scale:** 1:200
Revision:	



Proposed Landscaping and
Setting out Plan 1:200 @A3

Key TO LANDSCAPE PLAN

- Footway Construction to Highways Specification
- Charcoal Grey Driveway Block Paving
- Formpave Red Brindle Driveway Block Paving
- Charcoal Grey Driveway Block Paving
- 900 mm high timber boundary with 900 timber trellis panels
- 1800mm high brick wall and steel fencing
- 50x150mm concrete edging /pin Kerb

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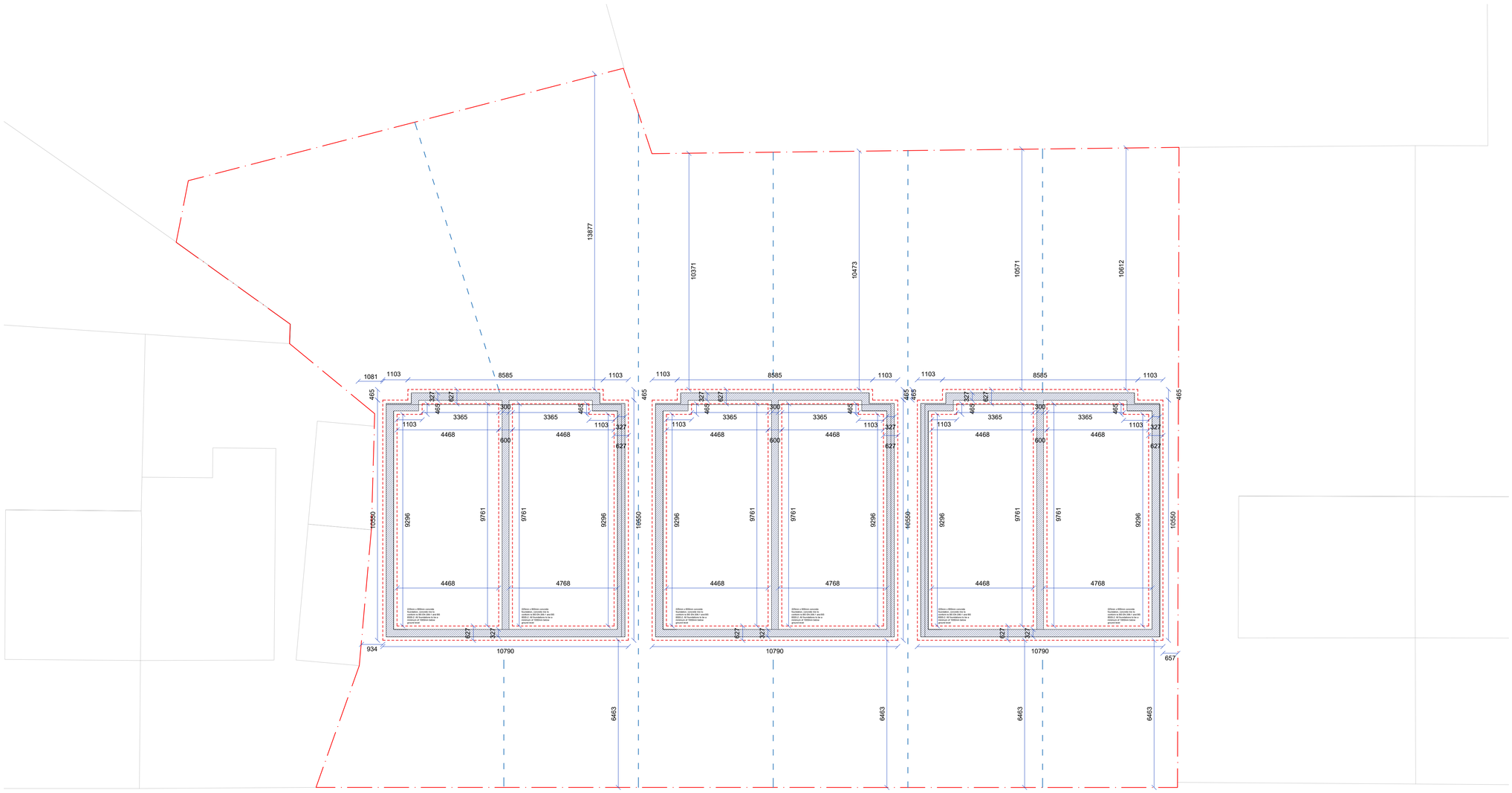
Revisions List:

HAD & Co.
www.hussainarchitecture.co.uk
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: Landscaping Plans	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 22-07-2022	**Paper:** A3
Drawing No: HAD3412-12	**Scale:** 1:200
Revision:	



Proposed Foundation Plans 1:100 @A1

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PARTY WALL ACT
The owner, should they need to do so under the requirements of the Party Wall Act 1996, has a duty to serve a Party Structure Notice on any adjoining owner if building work on, to or near an existing Party Wall involves any of the following:
• Support of beam
• Insertion of DPC through wall
• Raising a wall or cutting off projections
• Demolition and rebuilding
• Underpinning
• Insertion of lead flashings
• Excavations within 3 metres of an existing structure where the new foundations will go deeper than adjoining foundations, or within 6 metres of an existing structure where the new foundations are within a 45 degree line of the adjoining foundations.
A Party Wall Agreement is to be in place prior to start of works on site.

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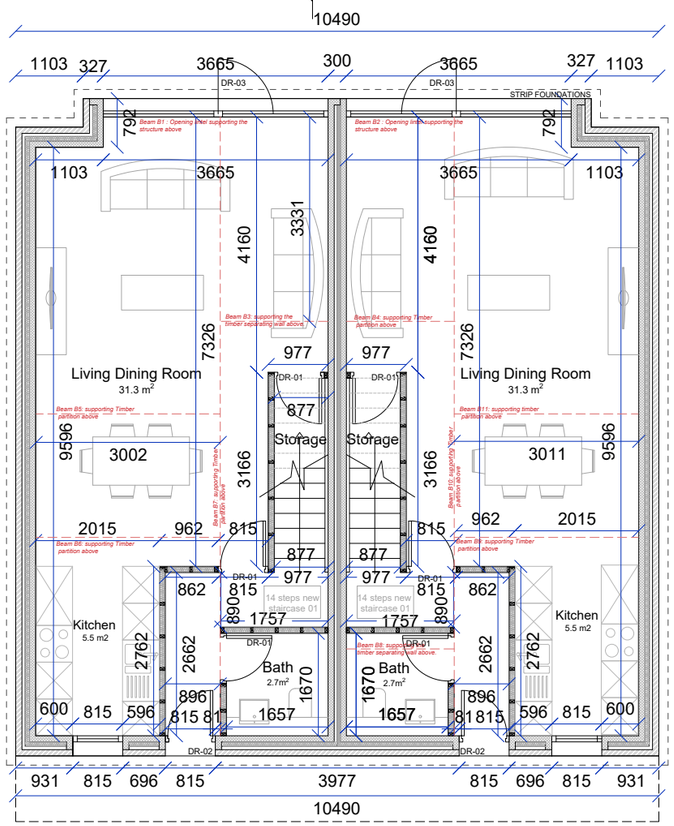
Revisions List:

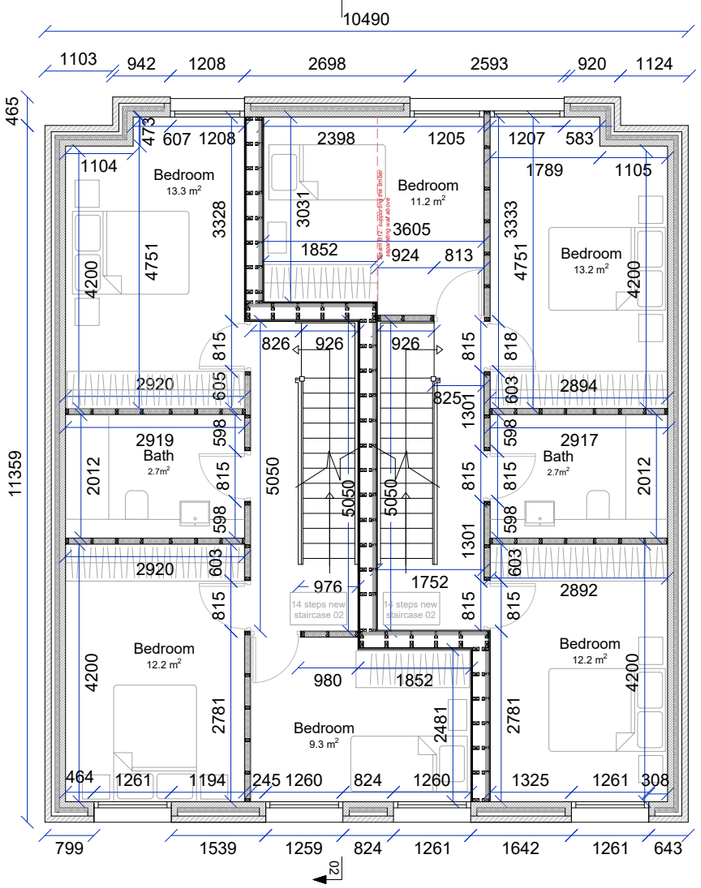
HAD & Co.
www.hadmanchester.co.uk
0161 327 2529

Address: Brendon Avenue
Moston
M40 9DN

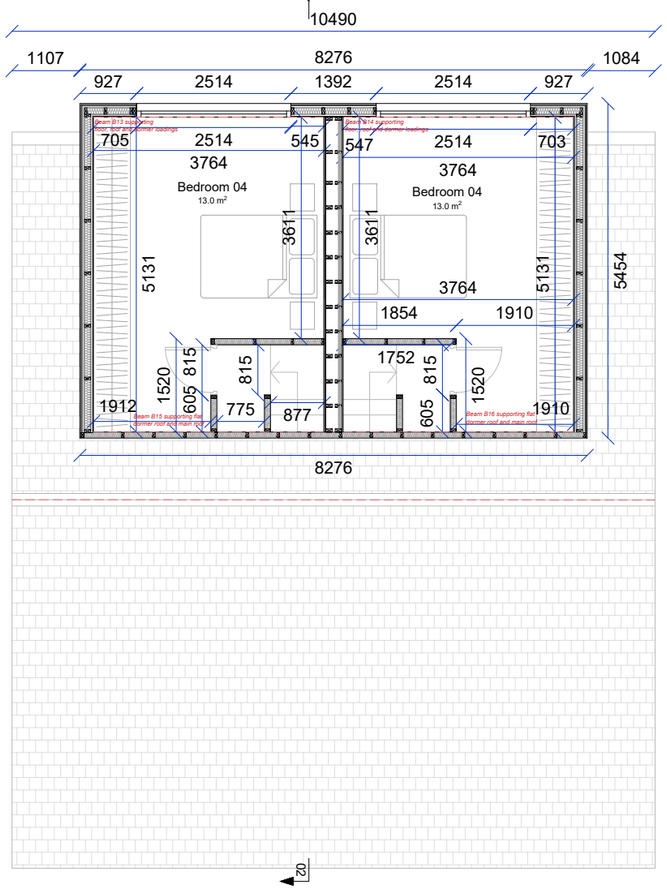
Title: Proposed Foundation Plans	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 20-10-2022	**Paper:** A1
Drawing No: HAD3412-13	**Scale:** 1:100
Revision:	



Proposed Ground Floor



Proposed First Floor



Proposed Second Floor

Dimensions Plans 1:100@A3

BEAMS:

Beam B1 : Opening lentil supporting the structure above.
Beam B2 : Opening lentil supporting the structure above.
Beam B3 : Supporting the timber separating wall above.
Beam B4 : Supporting the timber separating wall above.
Beam B5 : Supporting the Timber partition above
Beam B6 : Supporting the Timber partition above
Beam B7 : Supporting the Timber partition above
Beam B8 : Supporting the timber separating wall above.

Beam B9 : Supporting the Timber partition above
Beam B10 : Supporting the Timber partition above
Beam B11 : Supporting the Timber partition above
Beam B12 : Supporting the timber separating wall above.
Beam B13 : Supporting floor, roof and dormer loadings.
Beam B14 : Supporting floor, roof and dormer loadings.
Beam B15: Supporting flat dormer roof and the main roof.
Beam B16 : Supporting flat dormer roof and the main roof.

NOTE: Structure to be designed and specified by Structural engineer.

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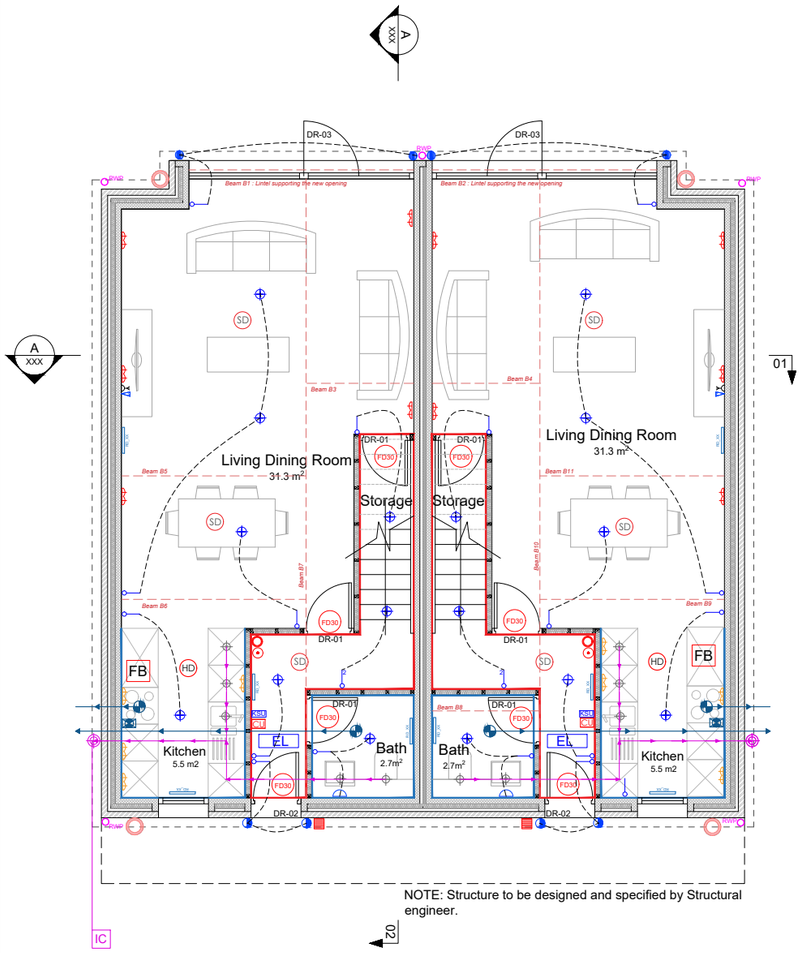
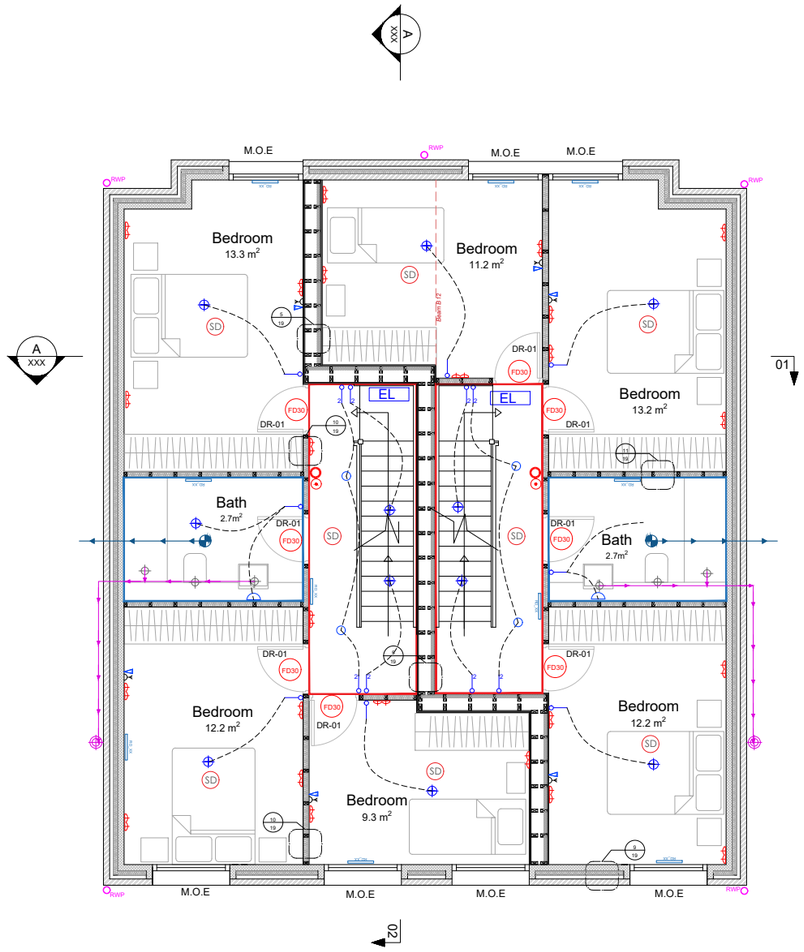
HAD & Co.
www.hussainarchitecture.co.uk
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: B-regs Dimensions Plans	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 20-10-2022	**Paper:** A3
Drawing No: HAD3412-14	**Scale:** 1:100
Revision:	



Proposed Ground Floor



Proposed First Floor

MEP Plans 1:100@A3

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Beam B10 : Supporting the Timber partition above
Beam B11 : Supporting the Timber partition above
Beam B12 : Supporting the timber separating wall above.

New Doors Table

Door	Size (h x w x t)	Specifications	No. of Doors	Reference
Door 01	1981 x 815 x 45 mm	Internal Door - Howdens Developer range with linings and stops or as specified by Employer/Client. Fire Resistant For Up To 30 Minutes (10 Year Manufacturer's Guarantee)	12	DR-01
Door 02	2040 x 826 x 40 mm	External Door - new timber composite door, residential access to have visibility glazing panel. Multi-locking points and designed to Secured-by-Design Silver standards to be a FD30.	2	DR-02
Door 03	2105 x 1045 x 70 mm	Steel reinforced 70mm uPVC profiles. Double glazed 28mm toughened safety glass units to BSEN12150 and BSEN1279.	2	DR-03

KEY:

- MECHANICAL EXTRACTION
- COOKER SWITCH
- 1 GANG 2 WAY LIGHT SWITCH
- 1 GANG LIGHT SWITCH
- EXTERNAL LIGHT TO BE PIR LIGHT
- EXTERNAL LIGHT - BULKHEAD TYPE
- RECESSED DOWNLIGHTER (Spotlight)
- WALL MOUNTED LIGHT FITTING
- ENERGY EFFICIENT LED LIGHTING POSITION
- WALL-HUNG RADIATOR
- VENTILATION DIRECTION
- RWP — RAIN WATER PIPE
- SOIL VENT PIPE
- FOUL WASTE DRAIN
- NEW DRAIN FLOW DIRECTION
- IC — INSPECTION CHAMBER
- FIRE PROTECTED WALL WITH 30MIN RESISTANCE, USE FIBREBOARD PLASTER BOARD IN THESE AREAS
- USE MOISTURE RESISTANT PLASTERBOARD IN THESE AREAS
- Low level double socket switched mains 240V power outlets at 450mm above floor
- High level double socket switched mains 240V power outlets at 1200mm above floor
- HD — COMBINED HEAT DETECTOR AND FIRE ALARM SOUNDER
- SD — COMBINED SMOKE/HEAT DETECTOR AND FIRE ALARM SOUNDER
- ENTRY ACCESS SYSTEM
- CU — CONSUMER UNIT
- TV AERIAL POINT
- CAT 5 or 6 DATA SOCKET
- KSU — TELEPHONE KEY SYSTEM
- Fire Alarm Call Point to conform to Type A BS EN 54-11:2001 installed in accordance with BS 5839-1.
- Fire Alarm Light to conform to BS EN 54-23:2010.
- FB — Location of fire blanket - to be approved in accordance to BS 1869:1997.
- M.O.E — Means of Escape
- EL — Emergency Lighting to conform to BS 5266-1:2016.

CCTV:

- Proposed cameras to be installed and linked into same CCTV system

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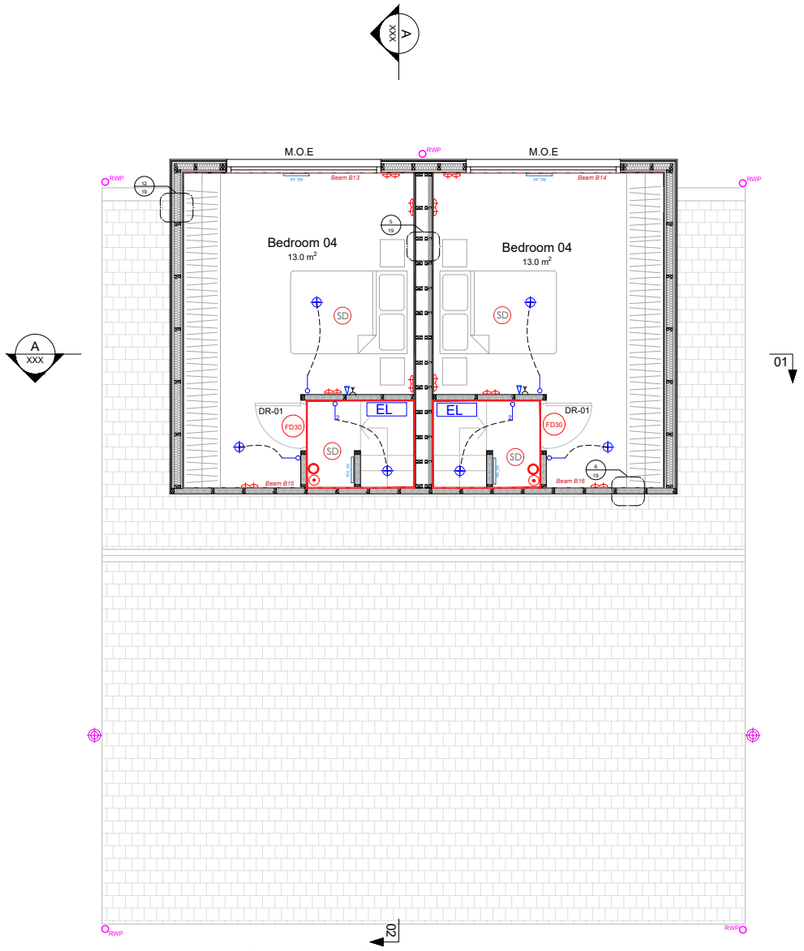
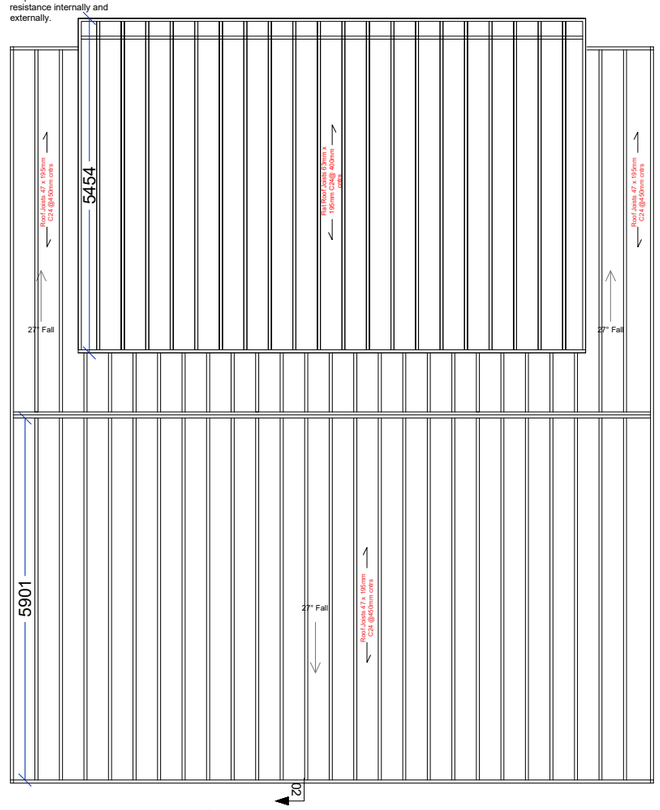
Client: Oseni Musa	**Checked:** SH
Date: 20-10-2022	**Paper:** A3
Drawing No: HAD3412-15	**Scale:** 1:100
Revision:	



Proposed Second Floor



Proposed Roof Joists Plan

BEAMS:

Beam B13 : Supporting floor, roof and dormer loadings.
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KEY:

- 1 GANG 2 WAY LIGHT SWITCH
- 1 GANG LIGHT SWITCH
- ENERGY EFFICIENT LED LIGHTING POSITION
- WALL-HUNG RADIATOR
- RAIN WATER PIPE
- SOIL VENT PIPE
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- Low level double socket switched mains 240V power outlets at 450mm above floor
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- TV AERIAL POINT
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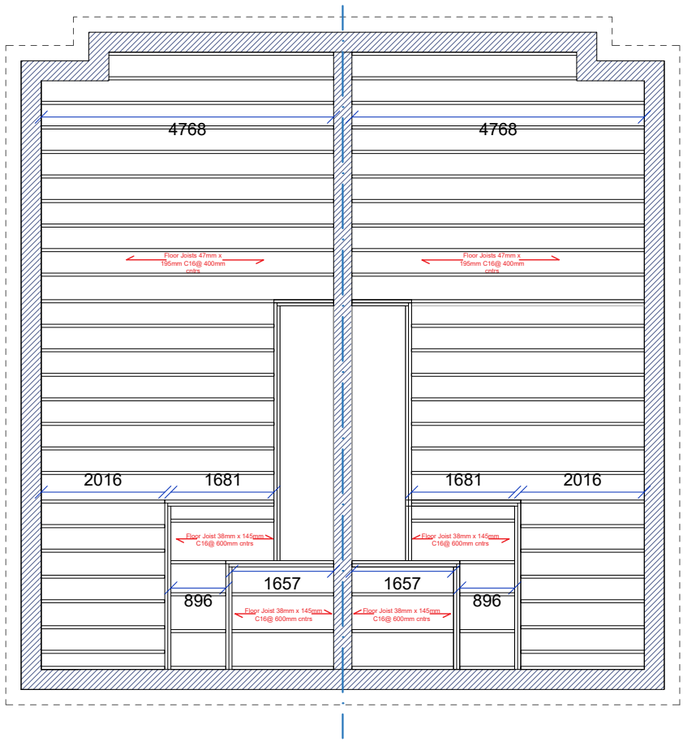
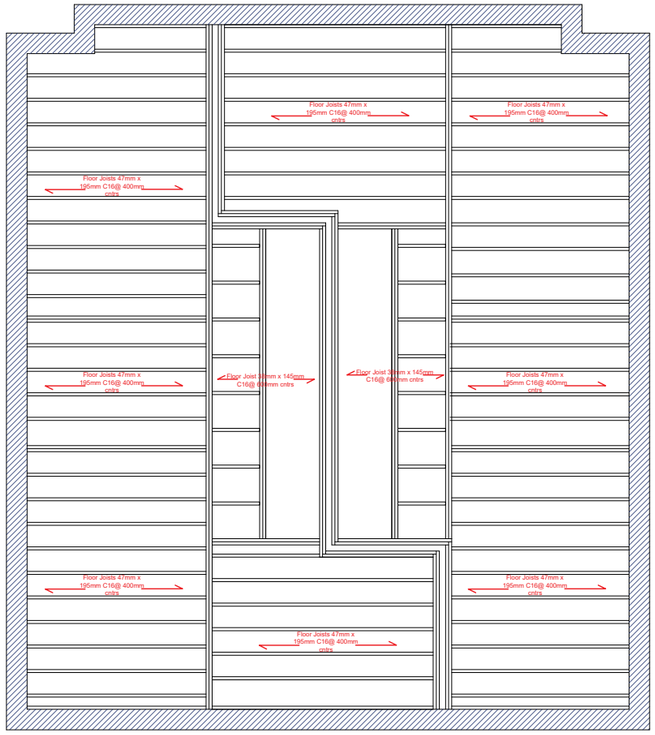
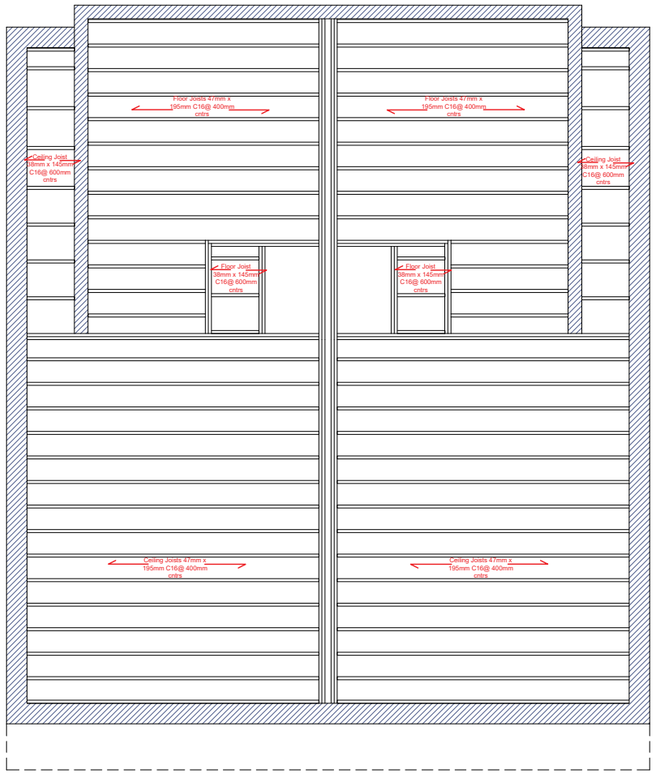
Date: 20-10-2022	**Paper:** A3
Drawing No: HAD3412-16	**Scale:** 1:100
Revision:	



Proposed GF Floor Joists Plan



Proposed 1st F Floor Joists/ GF Ceiling Joists Plan



Proposed 2nd F Floor Joists/ 1st F Ceiling Joists Plan

Table 6.2 Permissible clear spans for common or jack rafters

Slope of roof 15° or more but less than 22.5° Imposed load F_i = 0.75 kN/m² Single span

Strength Class C24 Service Class 1 or 2

		Dead loads F_d (kN/m²)								
		F_d not more than 0.5			F_d more than 0.5 but not more than 0.75			F_d more than 0.75 but not more than 1.00		
Size of rafter		Spacing of rafters (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	100	2.50	2.41	2.18	2.35	2.26	2.05	2.23	2.14	1.95
38	125	3.12	3.00	2.73	2.93	2.82	2.56	2.78	2.68	2.43
38	150	3.73	3.59	3.27	3.51	3.38	3.07	3.33	3.21	2.91
38	195	4.83	4.65	4.23	4.55	4.38	3.98	4.32	4.16	3.77
44	100	2.62	2.53	2.29	2.47	2.37	2.16	2.34	2.25	2.04
44	125	3.27	3.15	2.86	3.08	2.96	2.69	2.92	2.81	2.55
44	150	3.91	3.77	3.43	3.68	3.55	3.22	3.50	3.37	3.06
44	195	5.06	4.87	4.44	4.77	4.59	4.18	4.53	4.36	3.96
47	100	2.68	2.58	2.35	2.52	2.43	2.20	2.40	2.30	2.09
47	125	3.34	3.22	2.93	3.15	3.03	2.75	2.99	2.87	2.61
47	150	4.00	3.85	3.50	3.76	3.62	3.29	3.58	3.44	3.13
47	195	5.17	4.98	4.54	4.87	4.69	4.27	4.63	4.46	4.05
ALS/CLS										
38	89	2.23	2.14	1.95	2.10	2.01	1.83	1.95	1.89	1.73
38	140	3.49	3.35	3.05	3.28	3.15	2.87	3.11	2.99	2.72
38	184	4.56	4.39	4.00	4.29	4.13	3.76	4.08	3.92	3.56

Pitched Roof Joists Span Table

Size of joist		Spacing of joists (mm)								
Breadth (mm)	Depth (mm)	400	450	600	400	450	600	400	450	600
		Maximum clear span (m)								
38	97	1.92	1.90	1.84	1.84	1.81	1.73	1.76	1.73	1.65
38	120	2.55	2.52	2.42	2.42	2.38	2.27	2.31	2.27	2.15
38	145	3.26	3.21	3.07	3.07	3.01	2.86	2.92	2.86	2.70
38	170	3.99	3.92	3.63	3.74	3.66	3.41	3.54	3.46	3.24
38	195	4.73	4.56	4.15	4.41	4.30	3.91	4.16	4.06	3.71
38	220	5.33	5.14	4.68	5.03	4.84	4.40	4.78	4.60	4.18
44	97	2.05	2.03	1.96	1.96	1.93	1.85	1.88	1.85	1.76
44	120	2.72	2.68	2.58	2.58	2.53	2.41	2.46	2.41	2.28
44	145	3.47	3.42	3.25	3.27	3.20	3.04	3.11	3.04	2.86
44	170	4.24	4.16	3.81	3.96	3.88	3.58	3.75	3.66	3.40
44	195	4.97	4.78	4.36	4.67	4.51	4.10	4.40	4.29	3.90
44	220	5.59	5.38	4.91	5.27	5.08	4.62	5.02	4.83	4.39
47	97	2.12	2.09	2.02	2.02	1.99	1.90	1.94	1.90	1.81
47	120	2.80	2.76	2.65	2.65	2.61	2.48	2.53	2.48	2.35
47	145	3.57	3.51	3.33	3.36	3.29	3.12	3.19	3.12	2.94
47	170	4.35	4.27	3.89	4.07	3.98	3.66	3.85	3.76	3.48
47	195	5.07	4.89	4.45	4.78	4.61	4.19	4.52	4.38	3.98
47	220	5.71	5.50	5.01	5.39	5.19	4.72	5.13	4.93	4.49
63	97	2.41	2.38	2.29	2.29	2.26	2.16	2.20	2.16	2.05
63	120	3.18	3.13	3.00	3.00	2.94	2.80	2.86	2.80	2.64
63	145	4.03	3.96	3.66	3.78	3.70	3.45	3.58	3.50	3.28
63	170	4.87	4.69	4.28	4.56	4.43	4.03	4.31	4.20	3.84
63	195	5.56	5.36	4.90	5.25	5.06	4.62	5.00	4.82	4.39
63	220	6.25	6.03	5.51	5.91	5.69	5.20	5.63	5.42	4.94

Flat Roof Joists Span Table

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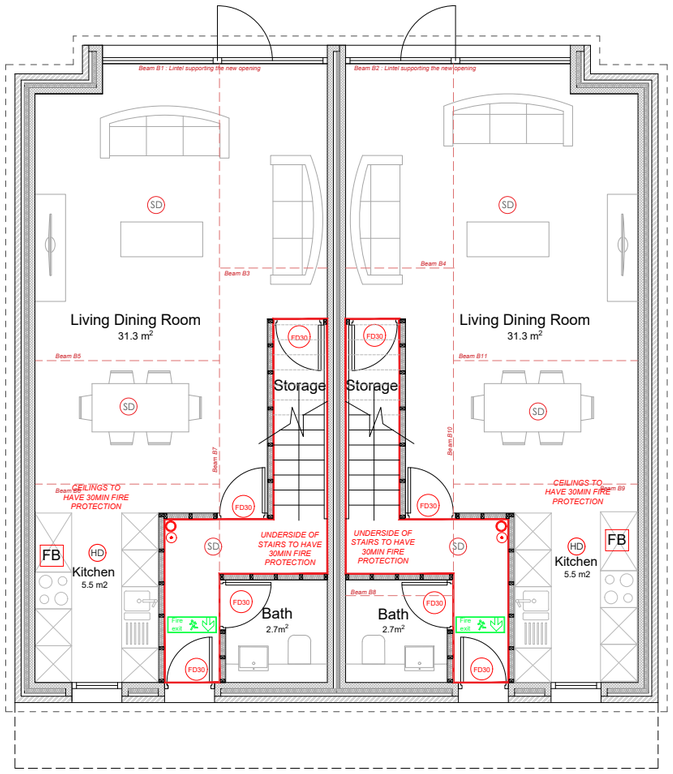
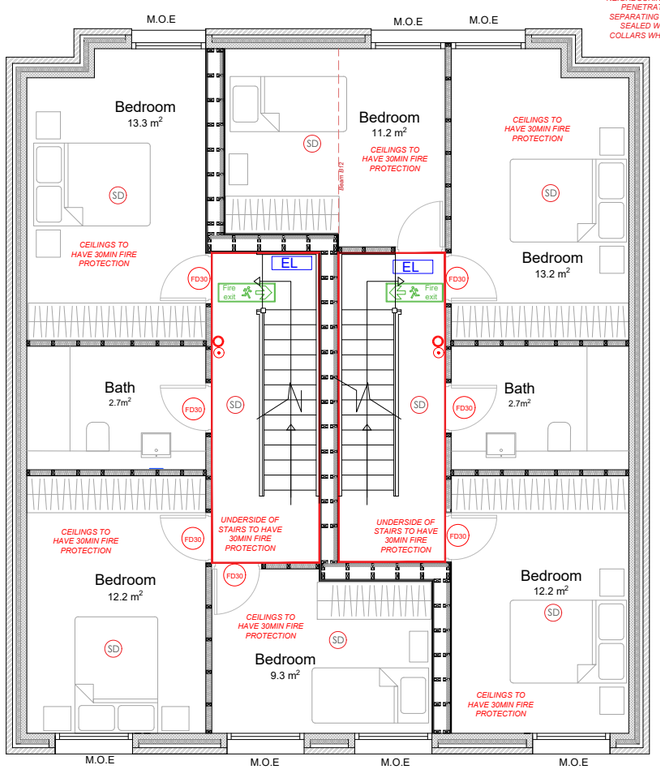
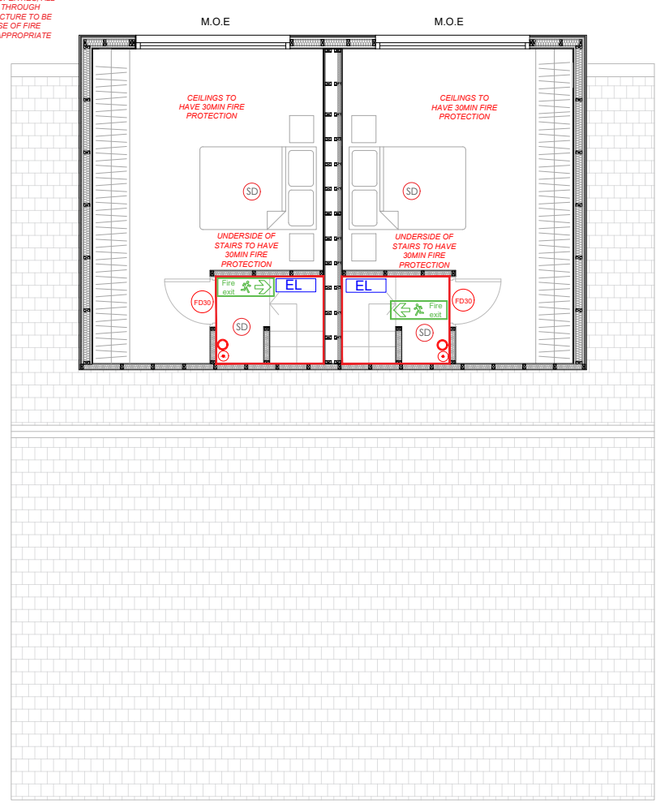
Client: Oseni Musa	**Checked:** SH
Date: 20-10-2022	**Paper:** A3
Drawing No: HAD3412-17	**Scale:** 1:100
Revision:	





NOTE:
UNDERSIDE OF STAIRS AND CEILINGS TO HAVE 30MIN FIRE PROTECTION. ALLOW NO POTENTIAL FIRE SPREAD THROUGH ATTIC SPACES TO NEIGHBOURING PROPERTIES. ALL PENETRATIONS THROUGH SEPARATING STRUCTURE TO BE SEALED WITH USE OF FIRE COLLARS WHERE APPROPRIATE



Fire Safety Key:

HD	Combined heat detector and fire alarm sounder, interlinked with smoke detectors and mains operated with back up batteries should comply with BS 5839-1:2002.
FD30	Denotes 30 minute fire resistant fire door and frame with self-closing hinges and intumescent strips should BCO require
SD	Denotes smoke detector to be mains operated self contained units to BS EN 54-11:2001. Detectors to be ceiling mounted and fitted minimum 300mm from any wall or light fitting. Alarms must be interconnected and wired to a separately fused circuit at the distribution board, and installed in accordance with manufacturers instructions.
EL	Emergency Lighting to conform to BS 5266-1:2016.
Fire exit	Denotes Fire Exits- doors to be signed to comply with BS5499/ BS EN 54-23:2010.
	Fire Alarm Call Point to conform to Type A BS EN 54-11:2001 installed in accordance with BS 5839-1.
	Fire Alarm Light to conform to BS EN 54-23:2010.
FB	Location of fire blanket - to be approved in accordance to BS 1869:1997.
	Fire protected wall with 30min resistance, use fireboard plaster board in these areas.
M.O.E	Means of Escape

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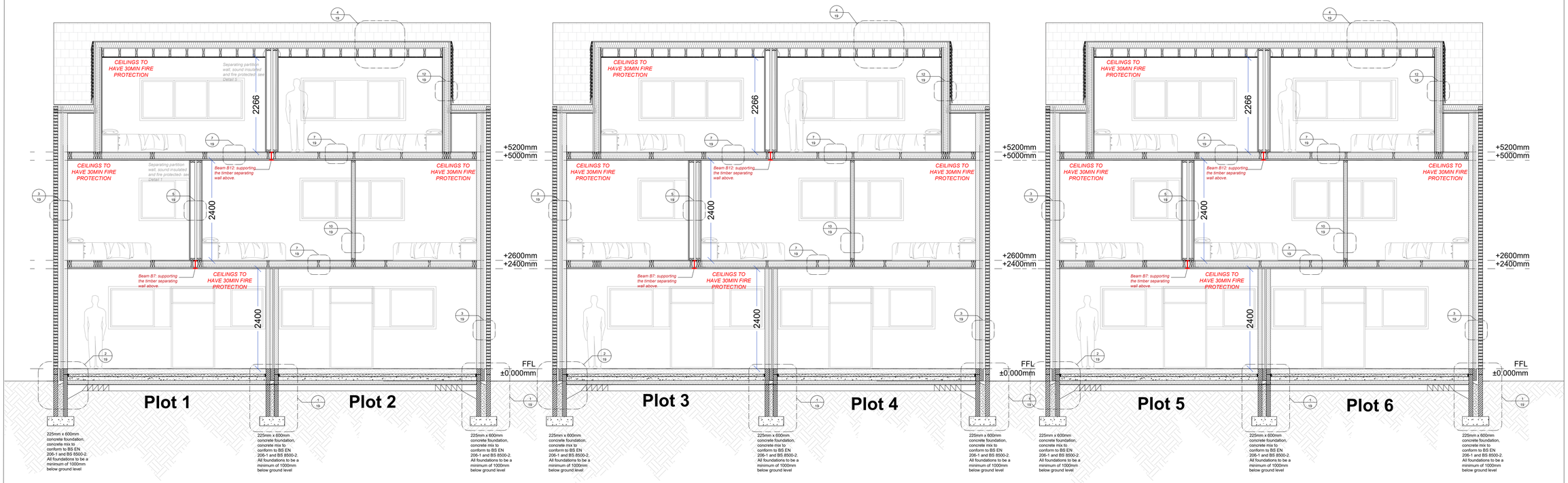
Revisions List:

HAD & Co.
www.hussainarchitecture.co.uk
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: Bregs Fire Strategy Plans	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 20-10-2022	**Paper:** A3
Drawing No: HAD3412-18	**Scale:** 1:100
Revision:	



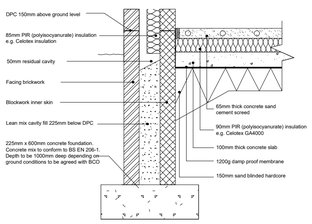
Proposed Section

Ref A.1- Scale 1:50 @ A1

DETAILS 1:20 @ A3

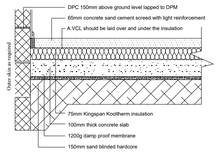
DETAIL 1

STRIP FOUNDATION



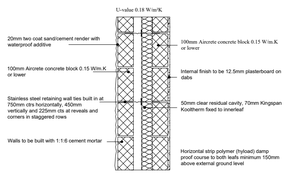
DETAIL 2

SOLID GROUND FLOOR



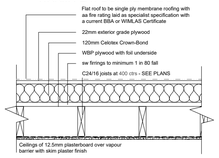
DETAIL 3

RENDERED PARTIAL FILL CAVITY WALL



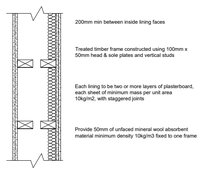
DETAIL 4

WARM FLAT DORMER ROOF



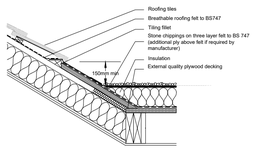
DETAIL 5

TIMBER FRAMED SEPARATING WALL (PLAN VIEW)



DETAIL 6

PITCHED ROOF AND FLAT ROOF ABUTMENT

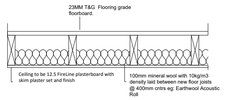


Structural design by suitably qualified engineer

DETAIL 7

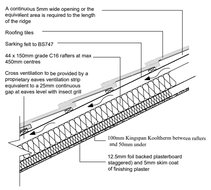
TIMBER FLOOR

(as detailed in Approved Document E1 and Knauf Separating floors 4.3 - manufacturers details to be followed)



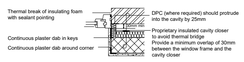
DETAIL 8

ROOF DETAIL



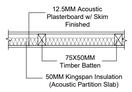
DETAIL 9

WINDOW REVEAL



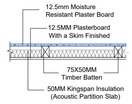
DETAIL 10

TIMBER PARTITIONS (Acoustic Plasterboard)



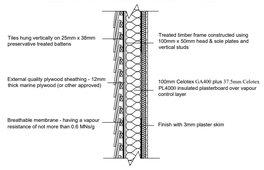
DETAIL 11

TIMBER PARTITIONS (Moisture Resistant Plaster Board)



DETAIL 12

TILE HUNG TIMBER FRAMED WALL



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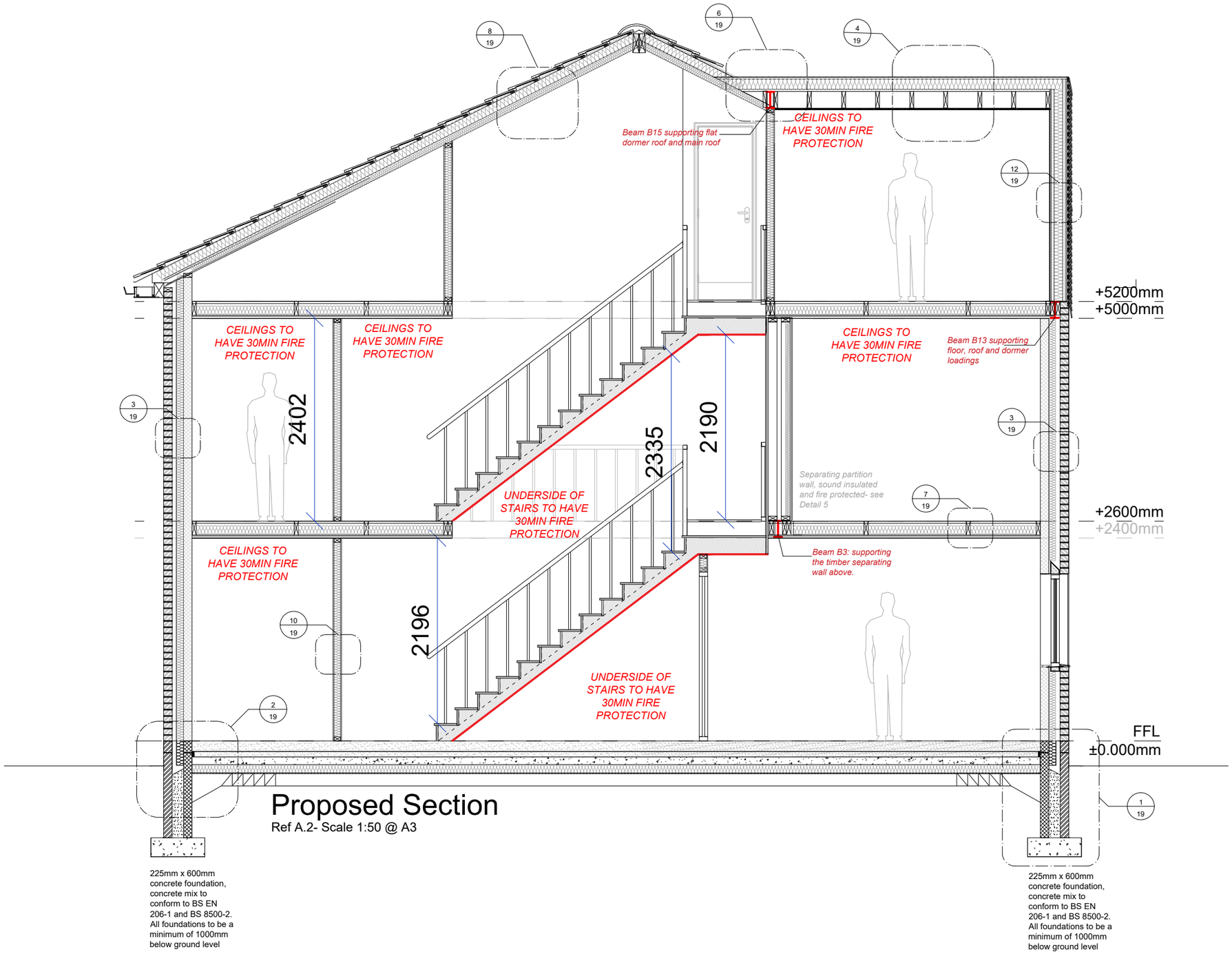
Revisions List:

HAD & Co.
www.hadmanchester.co.uk
0161 327 2529

Address: Brendon Avenue
Moston
M40 9DN

Title: Proposed Foundation Plans	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 20-10-2022	**Paper:** A1
Drawing No: HAD3412-19	**Scale:** 1:100
Revision:	



Proposed Section

Ref A.2- Scale 1:50 @ A3

225mm x 600mm concrete foundation, concrete mix to conform to BS EN 206-1 and BS 8500-2. All foundations to be a minimum of 1000mm below ground level

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Revisions List:

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01282 451428

Address: Brendon Avenue
Moston
M40 9DN

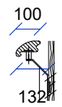
Title: Bregs Section A-2	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 24-10-2022	**Paper:** A3
Drawing No: HAD3412-20	**Scale:** 1:50
Revision:	

14 steps new staircase
01 & 02

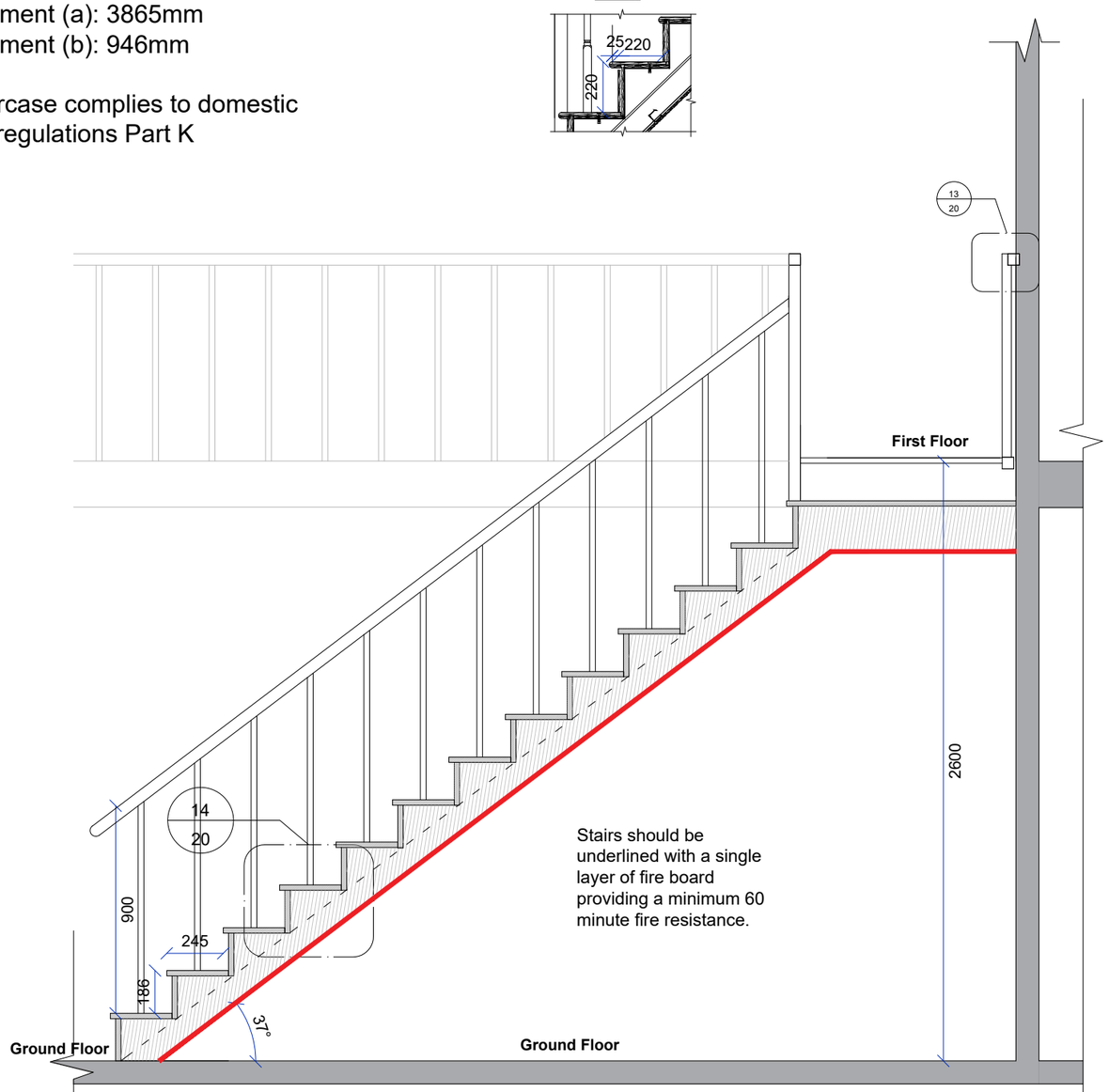
Floor to Floor: 2600mm
Ind. Rise: 185.7mm
Tread Length: 245mm
Angle: 37.2
Measurement (a): 3865mm
Measurement (b): 946mm

This staircase complies to domestic building regulations Part K

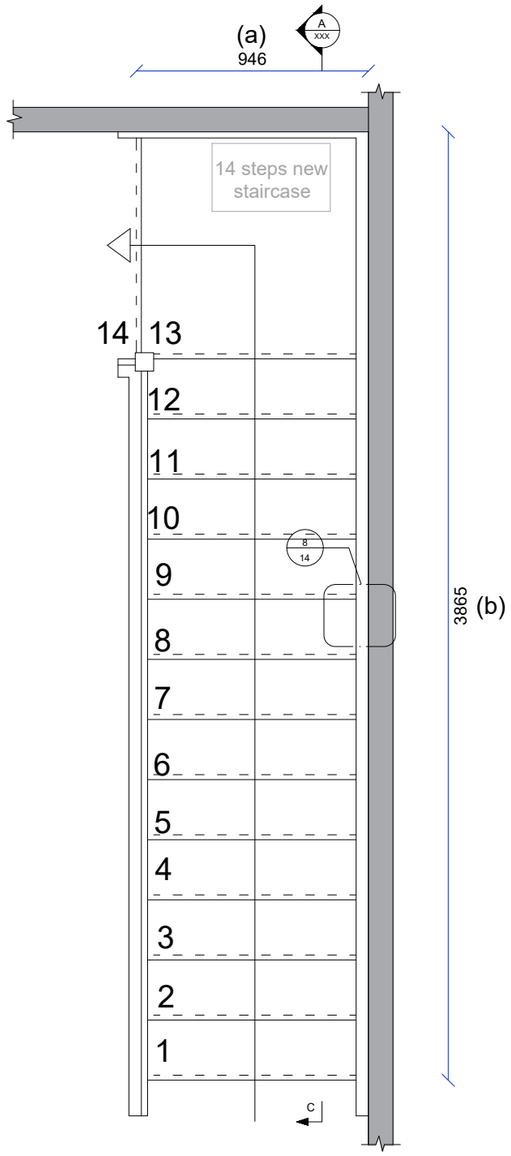
DETAIL 13



DETAIL 14



Proposed Staircase Sec A-C
1:25 @ A3



Proposed Staircase Plan
1:25 @ A3

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HAD & Co.
www.hussainarchitecture.co.uk
01282 451428

Address: Brendon Avenue
Moston
M40 9DN

Title: Bregs Staircase Details	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 24-10-2022	**Paper:** A3
Drawing No: HAD3412-21	**Scale:** 1:25
Revision:	

BUILDING REGULATION NOTES

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DEMOLITION

Measures to be put in place during and after the demolition to ensure the protection of the public, public amenities and adjoining properties.

Such measures to include:

- The shoring of adjoining buildings.
- The control of dust and noise generation.
- The weatherproofing of any parts of adjoining buildings which are left exposed by the demolition.
- The repairing and making good any damage to any adjacent building effected by the demolition.
- The removal of material or rubbish resulting from the clearance and demolition of the site.
- The disconnection, sealing or removal of any drain or sewer, as required.
- The making good of any disturbed ground.
- Any arrangements necessary for the disconnection off all services (e.g. gas, water, electricity).

Consultation with the Health and Safety Executive, and Fire Authority should be sought if burning structures or materials on site.

If the demolition is more than 50m³ in volume a formal notice of demolition is to be given to building control at least six weeks before any demolition work starts, in accordance with The Building Act 1984: Sections 80-83.

Consultation to be undertaken with the occupiers of adjacent buildings where applicable and a Party Wall agreement put in place. A planning application to demolish to be made where required.

All demolition work to comply with the Construction (Design and Management) Regulations 1994 and a Health and Safety plan is to be provided by the principal contractor.

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BASIC RADON PROTECTION

Provide a 1200g (300 um) radon membrane under floor slab lapped 300mm double welted and taped with gas proof tape at joints and service entry points. Carry membrane over cavity and provide suitable cavity tray and weep holes.

SITE PREPARATION

Ground to be prepared for new works by removing all unsuitable material, vegetable matter and tree or shrub roots to a suitable depth to prevent future growth. Seal up, cap off, disconnect and remove existing redundant services as necessary. Reasonable precautions must also be taken to avoid danger to health and safety caused by contaminants and ground gases e.g. landfill gases, radon, vapours etc. on or in the ground covered, or to be covered by the building.

BEAMS

Supply and install new structural elements such as new beams, roof structure, floor structure, bearings, and padstones in accordance with the Structural Engineer's calculations and details. New steel beams to be encased in 12.5mm Gyproc FireLine board with staggered joints, Gyproc FireCase or painted in Nullifire S or similar intumescent paint to provide 1/2 hour fire resistance as agreed with Building Control. All fire protection to be installed as detailed by specialist manufacturer.

LINTELS

- For uniformly distributed loads and standard 2 storey domestic loadings only

Lintel widths are to be equal to wall thickness. All lintels over 750mm sized internal door openings to be 65mm deep pre-stressed concrete plank lintels. 150mm deep lintels are to be used for 900mm sized internal door openings. Lintels to have a minimum bearing of 150mm on each end. Any existing lintels carrying additional loads are to be exposed for inspection at commencement of work on site. All pre-stressed concrete lintels to be designed and manufactured in accordance with BS EN 1992-1-1, with a concrete strength of 50 or 40 N/mm² and incorporating steel strands to BS 5896 to support loadings assessed to BS 5977 Part 1.

For other structural openings provide proprietary insulated steel lintels suitable for spans and loadings in compliance with Approved Document A and lintel manufactures standard tables. Stop ends, DPC trays and weep holes to be provided above all externally located lintels.

STRAPPING FOR PITCHED ROOF

Gable walls should be strapped to roofs at 2m centres. All external walls running parallel to roof rafters to be restrained at roof level using 1000mm x 30mm x 5mm galvanised mild steel horizontal straps or other approved to BSEN 845-1 built into walls at max 2000mm centres and to be taken across minimum 3 rafters and screw fixed. Provide solid noggins between rafters at strap positions. All wall plates to be 100 x 50mm fixed to inner skin of cavity wall using 30mm x 5mm x 1000mm galvanized metal straps or other approved to BSEN 845-1 at maximum 2m centres.

STRAPPING OF FLOORS

Provide lateral restraint where joists run parallel to walls, floors are to be strapped to walls with 1000mm x 30mm x 5mm galvanised mild steel straps or other approved in compliance with BS EN 845-1 at max 2.0m centres, straps to be taken across minimum of 3 joists. Straps to be built into walls. Provide 38mm wide x ¾ depth solid noggins between joists at strap positions.

OPENINGS AND RETURNS

An opening or recess greater than 0.1m² shall be at least 550mm from the supported wall (measured internally).

SOLID FLOOR INSULATION OVER SLAB

To meet min U value required of 0.22 W/m²K

Solid ground floor to consist of 150mm consolidated well-rammed hardcore. Blinded with 50mm sand blinding. Provide 100mm ST2 or Gen2 ground bearing slab concrete mix to conform to BS 8500-2 over a 1200 gauge polythene DPM. DPM to be lapped in with DPC in walls. Floor to be insulated over slab and DPM with min 75mm Kingspan Kooltherm K103.

25mm insulation to continue around floor perimeters to avoid thermal bridging. A VCL should be laid over the insulation boards and turned up 100mm at room perimeters behind the skirting, all joints to be lapped 150mm and sealed. Finish with 65mm sand/cement finishing screed with light mesh reinforcement.

Where drain runs pass under new floor, provide A142 mesh 1.0m wide and min 50mm concrete cover over length of drain.

Where existing suspended timber floor air bricks are covered by new extension, ensure cross-ventilation is maintained by connecting to 100mm dia UPVC pipes with 100mm concrete cover laid under the extension. Pipes to terminate at new 65mm x 215mm air bricks with cavity tray over.

PARTIAL FILL CAVITY WALL

To achieve minimum U Value of 0.28W/m²K

20mm two coat sand/cement render to comply to BS EN 13914-1:2005 with waterproof additive on 100mm medium dense block, 0.51 or lower. Ensure a 50mm clear residual cavity and provide 50mm Kooltherm K108 insulation fixed to inner leaf constructed using 100mm medium dense block, 0.51 or lower. Internal finish to be 12.5mm plasterboard on dabs. Walls to be built with 1:1:6 cement mortar.

DPC

Provide horizontal strip polymer (hyload) damp proof course to both internal and external skins minimum 150mm above external ground level. New DPC to be made continuous with existing DPC's and with floor DPM. Vertical DPC to be installed at all reveals where cavity is closed.

WALL TIES

All walls constructed using stainless steel vertical twist type retaining wall ties built in at 750mm ctrs horizontally, 450mm vertically and 225mm ctrs at reveals and corners in staggered rows. Wall ties to be suitable for cavity width and in accordance with BS 5628 and BS EN 845-1: 2003

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Title: Bregs Notes	**Drawn:** HA
Client: Oseni Musa	**Checked:** SH
Date: 20-10-2022	**Paper:** A3
Drawing No: HAD3412-22	**Scale:** 1:100
Revision:	

CAVITIES

Provide cavity trays over openings. All cavities to be closed at eaves and around openings using Thermabate or similar non combustible insulated cavity closers. Provide vertical DPCs around openings and abutments. All cavity trays must have 150mm upstands and suitable cavity weep holes (min 2) at max 900mm centres.

CAVITY BARRIERS

30 minute fire resistant cavity barriers to be provided at at tops of walls, gable end walls and vertically at junctions with separating walls & horizontally at separating walls with cavity tray over installed according to manufacturers details.

BEAMS AND STRUCTURE

Engineer's Structural calculations and details are to be provided for all beams, roof, lintels, joists, bearings, padstones and any other load bearing elements before works commence on site. New steel beams to be encased in 12.5mm Gyproc FireLine board with staggered joints, Gyproc FireCase or painted in Nullifire S or similar intumescent paint to provide 1/2 hour fire resistance as agreed with Building Control. All fire protection to be installed as detailed by specialist manufacturer.

DORMER CONSTRUCTION -TIMBER CLADDING

To achieve minimum U Value of 0.28W/m²K

Structure to engineer's details and calculations. Cladding top be hung on on 25 x 38mm preservative treated battens and according to manufacturer's instructions. (vertical counter battens to be provided to ensure vented and drained cavity if required) fixed to breathable membrane (having a vapour resistance of not more than 0.6 MNs/g) and 12mm thick W.B.P external quality plywood sheathing (or other approved). Ply fixed to treated timber frame studs constructed using: 100mm x 50mm head and sole plates and vertical studs (with noggins) at 400mm centres or to structural engineer's details and calculations. Insulation to be 100mm Celotex GA4000 between studs plus 37.5mm Celotex PL4000 over. Provide a vapour control layer fixed to internal face of insulation and finish with 3mm skim coat of finishing plaster.

All junctions to have water tight construction, seal all perimeter joints with tape internally and with silicon sealant externally. Dormer walls built off existing masonry walls to have galvanised mild steel straps placed at 900 centres. Dormer cheeks within 1m of the boundary to be lined externally with 12.5mm Supalux and 12.5mm Gyproc FireLine board internally to achieve 1/2 hour fire resistance from both sides.

-or-

DORMER CONSTRUCTION - RENDER

To achieve minimum U Value of 0.28W/m²K

Structure to engineer's details and calculations. Render finish (to comply with BS EN 13914-1) - applied in 3 coats at least 20mm thick to stainless steel render lath. Render should be finished onto an approved render stop. Render lath fixed to vertical 25 x 50mm preservative treated battens to provide vented and drained cavity, fixed to breathable membrane (having a vapour resistance of not more than 0.6 MNs/g) and 12mm thick W.B.P external quality plywood sheathing (or other approved). Ply fixed to treated timber frame studs constructed using 150mm x 50mm head and sole plates and vertical studs (with noggins) at 400mm centres or to structural engineer's details and calculations. Studs infilled with 95mm Kingspan TW55 insulation and over boarded with 12.5mm Knauf wall board with vapour check. Finish with 3mm skim coat of finishing plaster.

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DORMER FLAT ROOF

(imposed load max 1.0 kN/m² - dead load max 0.75 kN/m²)

To achieve U value of 0.18 W/m²K

To Structural Engineer's details. Flat roof to be single ply membrane roofing with aa fire rating as specialist specification, with a current BBA or WIMLAS Certificate on 22mm exterior grade plywood, laid on firrings to give a 1:40 fall on 47 x 170mm grade C16 joists at 450 centres max span 4.51m (see engineer's details for sizes). Cross ventilation to be provided on opposing sides by a proprietary eaves ventilation strip equivalent to 25mm continuous ventilation, with fly proof screen. Flat roof insulation is to be continuous with the wall insulation but stopped back to allow a 50mm air gap above the insulation for ventilation. Insulation to be 120mm Celotex XR4120 between joists and 40mm Celotex PL4000 insulated plasterboard over VCL under joists. Finish with a plaster skim.

Provide restraint to flat roof by fixing using of 30 x 5 x 1000mm ms galvanised lateral restraint straps at maximum 2000mm centres fixed to 100 x 50mm wall plates and anchored to wall. Workmanship to comply to BS 8000:4.

PITCHED ROOF

(imposed load max 0.75 kN/m² - dead load max 0.75 kN/m²)

Vented roof - pitch 22-45°

To achieve U-value 0.18 W/m²K

Timber roof structures to be designed by an Engineer in accordance with NHBC Technical Requirement R5 Structural Design. Calculations to be based on BS EN 1995-1-1. Roofing tiles to match existing on 25 x 38mm tanalised sw treated battens on sarking felt to relevant BBA Certificate. Supported on 44 x 165mm grade C16 rafters at max 600mm centres max span 3.47m. Rafters supported on 100 x 50mm sw wall plates. Insulation to be 100mm Kingspan Thermapitch between rafters and 50mm under rafters. Fix 12.5mm foil backed plasterboard (joints staggered) and 5mm skim coat of finishing plaster to the underside of all ceilings using galvanized plasterboard nails. If required provide a cavity of 25mm by fixing batten between plasterboard and under rafter insulation (recommended where insulation under rafters exceeds 50mm).

Maintain a 50mm air gap above insulation to ventilate roof. Provide opening at eaves level at least equal to continuous strip 25mm wide and opening at ridge equal to continuous strip 5mm wide to promote ventilation.

Restraint strapping - Ceiling joists tied to rafters (if raised collar roof consult structural engineer). 100mm x 50mm wall plate strapped down to walls. Ceiling joists and rafters to be strapped to walls and gable walls, straps built into cavity, across at least 3 timbers with noggins. All straps to be 1000 x 30 x 5mm galvanized straps or other approved to BSEN 845-1 at 2m centres.

INTERMEDIATE FLOORS

Intermediate floor to be 25mm t&g flooring grade chipboard or floorboards laid on C24 joists at 400mm ctrs (see engineer's calculation for sizes and details). Lay 100mm Rockwool mineral fibre quilt insulation min 10kg/m³ or equivalent between floor joists. Ceiling to be 12.5 FireLine plasterboard with skim plaster set and finish. Joist spans over 2.5m to be strutted at mid span using 38 x 38mm herringbone strutting or 38mm solid strutting (at least 2/3 of joist depth). In areas such as kitchens, utility rooms and bathrooms, flooring to be moisture resistant grade in accordance with BS EN 312:2010. Identification marking must be laid upper most to allow easy identification. Provide lateral restraint where joists run parallel to walls, floors are to be strapped to walls with 1000mm x 30mm x 5mm galvanised mild steel straps or other approved in compliance with BS EN 845-1 at max 2.0m centres, straps to be taken across minimum 3 no. joists. Straps to be built into walls. Provide 38mm wide x ¾ depth solid noggins between joists at strap positions.

NEW WINDOWS

New windows to be double glazed with 16mm argon gap and soft coat low-E glass. Window Energy Rating to be Band C or better and to achieve U-value of 1.6 W/m²K. The door and window openings should be limited to 25% of the extension floor area plus the area of any existing openings covered by the extension.

LEAD WORK AND FLASHINGS

All lead flashings, any valleys or soakers to be Code 5 lead and laid according to Lead Development Association. Flashings to be provided to all jambs and below window openings with welded upstands. Joints to be lapped min 150mm and lead to be dressed 200mm under tiles, etc. All work to be undertaken in accordance with the Lead Development Association recommendations.

LEAD VALLEYS

Lead-lined valleys to be formed using Code 5 lead sheet. Valley lead and two tiling fillets to be supported on min 19mm thick and 225mm wide marine ply valley boards on either side of the rafters. Lead to be laid in lengths not exceeding 1.5m with min 150mm lap joints and be dressed 200mm under the tiles.

Roofing tiles to be bedded in mortar placed on a tile slip to prevent direct contact. Valley to have a minimum 100mm wide channel (125mm minimum for pitches below 30°).

All work to be in accordance with the roof cladding manufacturers and the Lead Development Association recommendations..

NEW STAIRCASE

Dimensions to be checked and measured on site prior to fabrication of stairs. Timber stairs to comply with BS585 and with Part K of the Building Regulations. Max rise 220mm, min going 220mm. Two risers plus one going should be between 550 and 700mm. Tapered treads to have going in centre of tread at least the same as the going on the straight. Min 50mm going of tapered treads measured at narrow end. Pitch not to exceed 42 degrees. The width and length of every landing should be at least as great as the smallest width of the flight. Doors which swing across a landing at the bottom of a flight should leave a clear space of at least 400mm across the full width of the flight. Min 2.0m headroom measured vertically above pitch line of stairs and landings. However, if there is not enough space to achieve this height the headroom will be satisfactory if the height measured at the centre of the stair width is l.9 m reducing to 1.8m at one side of the stair. Handrail on staircase to be 900mm above the pitchline, handrail to be at least one side if stairs are less than 1m wide and on both sides if they are wider. Ensure a clear width between handrails of minimum 600mm. Balustrading designed to be unclimbable and should contain no space through which a 100mm sphere could pass. Allow for all structure as designed by a Structural Engineer.

INTERNAL STUD PARTITIONS

100mm x 50mm softwood treated timbers studs at 400mm ctrs with 50 x 100mm head and sole plates and solid intermediate horizontal noggins at 1/3 height or 450mm. Provide min 10kg/m³ density acoustic soundproof quilt tightly packed (eg. 100mm Rockwool or Isowool mineral fibre sound insulation) in all voids the full depth of the stud. Partitions built off doubled up joists where partitions run parallel or provide noggins where at right angles, or built off DPC on thickened concrete slab if solid ground floor. Walls faced throughout with 12.5mm plaster board with skim plaster finish. Taped and jointed complete with beads and stops.

ELECTRICAL

All electrical work required to meet the requirements of Part P (electrical safety) must be designed, installed, inspected and tested by a competent person registered under a competent person self certification scheme such as BRE certification Ltd, BSI, NICEIC Certification Services or Zurich Ltd. An appropriate BS7671 Electrical Installation Certificate is to be issued for the work by a person competent to do so. A copy of a certificate will be given to Building Control on completion.

INTERNAL LIGHTING

Install low energy light fittings that only take lamps having a luminous efficiency greater than 45 lumens per circuit watt and a total output greater than 400 lamp lumens. Not less than three energy efficient light fittings per four of all the light fittings in the main dwelling spaces to comply with Part L of the current Building Regulations and the Domestic Building Services Compliance Guide.

Notes:

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

All work and materials should comply with Health and Safety legislation.

All dimensions are in millimetres unless where explicitly shown otherwise.

The contractor should check and certify all dimensions as work proceeds and notify the agent of any discrepancies.

Do not scale off the drawings, if in doubt ask.

HAD & Co. are not liable for any work undertaken prior to Full Planning Consent and/ or Building Regulations Approval.

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

Domestic clients
The domestic client is to appoint a principal designer and a principal contractor when there is more than one contractor, if not your duties will automatically transferred to the contractor or principal contractor.
The designer can take on the duties, provided there is a written agreement between you and the designer to do so.

The Health and Safety Executive is to be notified as soon as possible before construction work starts if the works:
(a) Last longer than 30 working days and has more than 20 workers working simultaneously at any point in the project.
Or:
(b) Exceeds 500 person days.

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

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

Basic surface water plans, will need to be confirmed by a drainage consultant at a later date

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HEATING

Extend all heating and hot water services from existing and provide new TRVs to radiators. Heating system to be designed, installed, tested and fully certified by a GAS SAFE registered specialist. All work to be in accordance with the Local Water Authorities bye laws, the Gas Safety (Installation and Use) Regulations 1998 and IEE Regulations.

MEANS OF ESCAPE - Fire doors

Form a protected escape stairway by providing half hour fire resistance to all partitions as well as floors and ceilings above and below rooms. Stairway to be protected at all levels - from the loft room/rooms then leading directly to an external door at ground level (no inner rooms allowed). All doors on to the stairway must be FD20 rated fire doors to BS 476-22:1987 or the European equivalent BS EN 1634 (fitted with intumescent strips rebated around sides & top of door or frame if required by BCO). Where applicable, any glazing in fire doors to be half hour fire resisting and glazing in the walls forming the escape route enclosure to have 30 minutes fire resistance and be at least 1.1m above the floor level or stair pitch line.

MEANS OF ESCAPE - SDs in all rooms and retaining existing doors (LABC guidance note Ref 07/02).

The following 3 conditions should All be met:

a) Provide smoke detectors at every storey level, at half landing levels adjacent to habitable rooms and in all habitable rooms. An additional heat detector is also required in the kitchen. Smoke detection to be mains operated linked smoke alarm detection system to BS 5446 - 1:2000 mains powered with battery back up.

b) Provide an egress window at first floor level with an unobstructed openable area that complies with:

- minimum height of 450mm and minimum width of 450mm.
- minimum area 0.33m².
- the bottom of the openable area should be not more than 1100mm above the floor.

The window should enable the person to reach a place free from danger from fire.

c) Provide a protected escape route requiring doors to be min standard of traditional timber panel type at least 32mm thick, with steel hinges, not warped and fitting well into its frame with no visible defects particularly in the panels, (hardboard or other lightweight flush doors are not acceptable). Walls throughout stair enclosure and frames around doors must be checked and be free from defects as required by the Building Control Officer. Any glazing in doors to be half hour fire resisting and glazing in the walls forming the escape route enclosure to have 30 minutes fire resistance and be at least 1.1m above the floor level or stair pitch line.

SMOKE DETECTION

Mains operated linked smoke alarm detection system to BS EN 14604 and BS 5839-6:2019 to at least a Grade D category LD3 standard and to be mains powered with battery back up. Smoke alarms should be sited so that there is a smoke alarm in the circulation space on all levels/ storeys and within 7.5m of the door to every habitable room. If ceiling mounted they should be 300mm from the walls and light fittings. Where the kitchen area is not separated from the stairway or circulation space by a door, there should be an interlinked heat detector in the kitchen.

ESCAPE WINDOWS

Provide emergency egress windows to any newly created first floor habitable rooms and ground floor inner rooms. Windows to have an unobstructed openable area that complies with:

- minimum height of 450mm and minimum width of 450mm.
- minimum area 0.33m².
- the bottom of the openable area should be not more than 1100mm above the floor.

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BACKGROUND AND PURGE VENTILATION

Background ventilation - Controllable background ventilation via trickle vents to BS EN 13141-3 within the window frame to be provided to new habitable rooms at a rate of min 5000mm²; and to kitchens, bathrooms, WCs and utility rooms at a rate of 2500mm²

Purge ventilation - New Windows/rooflights to have openable area in excess of 1/20th of their floor area, if the window opens more than 30° or 1/10th of their floor area if the window opens less than 30°

Internal doors should be provided with a 10mm gap below the door to aid air circulation.

Ventilation provision in accordance with the Domestic Ventilation Compliance Guide.

EXTRACT TO BATHROOM

Bathroom to have mechanical vent ducted to external air to provide min 15 litres / sec extraction. Vent to be connected to light switch and to have 15 minute over run if no window in room. Internal doors should be provided with a 10mm gap below the door to aid air circulation. Ventilation provision in accordance with the Domestic Ventilation Compliance Guide. Intermittent extract fans to BS EN 13141-4. All fixed mechanical ventilation systems, where they can be tested and adjusted, shall be commissioned and a commissioning notice given to the Building Control Body.

EXTRACT TO KITCHEN

Kitchen to have mechanical ventilation with an extract rating of 60l/sec or 30l/sec if adjacent to hob to external air, sealed to prevent entry of moisture. Internal doors should be provided with a 10mm gap below the door to aid air circulation. Ventilation provision in accordance with the Domestic Ventilation Compliance Guide. Intermittent extract fans to BS EN 13141-4. Cooker hoods to BS EN 13141-3. All fixed mechanical ventilation systems, where they can be tested and adjusted, shall be commissioned and a commissioning notice given to the Building Control Body.

UNDERGROUND FOUL DRAINAGE

Underground drainage to consist of 100mm diameter UPVC proprietary pipe work to give a 1:40 fall. Surround pipes in 100mm pea shingle. Provide 600mm suitable cover (900mm under drives). Shallow pipes to be covered with 100mm reinforced concrete slab over compressible material. Provide rodding access at all changes of direction and junctions. All below ground drainage to comply with BS EN 1401-1: 2009.

INSPECTION CHAMBERS

Underground quality proprietary UPVC 450mm diameter inspection chambers to be provided at all changes of level, direction, connections and every 45m in straight runs. Inspection chambers to have bolt down double sealed covers in buildings and be adequate for vehicle loads in driveways.

ABOVE GROUND DRAINAGE

All new above ground drainage and plumbing to comply with BS EN 12056-2:2000 for sanitary pipework. All drainage to be in accordance with Part H of the Building Regulations. Wastes to have 75mm deep anti vac bottle traps and rodding eyes to be provided at changes of direction.

Size of wastes pipes and max length of branch connections (if max length is exceeded then anti vacuum traps to be used)

Wash basin - 1.7m for 32mm pipe 3m for 40mm pipe

Bath/shower - 3m for 40mm pipe 4m for 50mm pipe

W/c - 6m for 100mm pipe for single WC

All branch pipes to connect to 110mm soil and vent pipe terminating min 900mm above any openings within 3m.

Or to 110mm upvc soil pipe with accessible internal air admittance valve complying with BS EN 12380, placed at a height so that the outlet is above the trap of the highest fitting.

Waste pipes not to connect on to SVP within 200mm of the WC connection.

Supply hot and cold water to all fittings as appropriate.

SOIL AND VENT PIPE

Svp to be extended up in 110mm dia UPVC and to terminate min 900mm above any openings within 3m. Provide a long radius bend at foot of SVP.

PIPEWORK THROUGH WALLS

Where new pipework passes through external walls form rocker joints either side wall face of max length 600mm with flexible joints with short length of pipe bedded in wall.

Alternatively provide 75mm deep pre-cast concrete plank lintels over drain to form opening in wall to give 50mm space all round pipe: mask opening both sides with rigid sheet material and compressible sealant to prevent entry of fill or vermin.

RAINWATER DRAINAGE

New rainwater goods to be new 110mm UPVC half round gutters taken and connected into 68mm dia UPVC downpipes. Rainwater taken to new soakaway, situated a min distance of 5.0m away from any building, via 110mm dia UPVC pipes surrounded in 150mm granular fill. Soakaway to be min of 1 cubic metre capacity (or to depth to Local Authorities approval) with suitable granular fill and with geotextile surround to prevent migration of fines. If necessary, carry out a porosity test to determine design and depth of soakaway.

FIXED EXTERNAL LIGHTING

External light fittings to be fitted as calculated in the DER and in compliance with the Domestic Building Services Compliance Guide.

Light fitting to be either:

a. lamp capacity not greater than 100 lamp-watts per light fitting and provided with automatic movement detecting devices (PIR) and automatic daylight sensors ensuring lights shut off automatically when not required.

Or

b. lamp efficacy greater than 45 lumens per circuit-watt; fitted with manual controls and automatic day light cut-off sensors so that lights switch off when daylight is sufficient.

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Appendix C: Proposed Mitigation

PILKINGTON

Pilkington **Optiphon**™

Laminated Glass for noise control

NSG GROUP

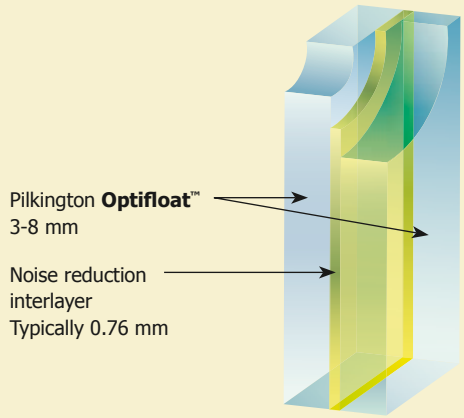
Pilkington **Optiphon**™

Laminated glass for superior noise insulation

Pilkington **Optiphon**™ is the ideal choice of glass in situations where there is excess noise from road, rail or air traffic, or various other sources, such as factories, nightclubs or neighbours.

Pilkington **Optiphon**™ is a high quality acoustic laminated glass incorporating a special PVB (PolyVinyl Butyral) interlayer. It offers excellent noise reduction without compromising on light transmittance or impact performance.

The desired acoustic performance can be achieved through combining various thicknesses of glass with a PVB interlayer. With a large variety of product combinations, Pilkington **Optiphon**™ offers the opportunity to achieve specific noise reduction requirements.



Note: Pilkington **Optiphon**™ can also be manufactured with other products, including coated glass

Benefits

- Special PVB interlayer for enhanced sound insulation performance
- A thinner and lighter glass for the equivalent acoustic performance
- Available in jumbo and LES sizes
- All products achieve safety class 1(B)1 (EN 12600) and are available to meet security classes in accordance with EN 356
- A high acoustic performance can be achieved when used in Insulating Glass Units (IGUs)
- Can also be used to improve noise insulation in a triple glazing construction

As well as reducing intrusive noise, Pilkington **Optiphon**™ can be combined with other Pilkington products for a multi-functional glazing solution with additional benefits, such as:

- Thermal insulation with Pilkington **K Glass**™ / Pilkington **Optitherm**™ (coating in position 3 in IGU)
- Solar control with Pilkington **Suncool**™ (coating in position 2 in IGU)
- Self-cleaning with Pilkington **Activ**™ (coating in position 1 in IGU)

Sound insulation data for Pilkington **Optiphon™**

Glass	Sound reduction index (dB)									
	Octaveband Centre Frequency (Hz)						R_w (C; C_{tr})	R_w	R_w+C	R_w+C_{tr}
	125	250	500	1000	2000	4000				
Single glazing										
6.8 mm Pilkington **Optiphon™**	22	26	31	37	40	40	36 (-1; -4)	36	35	32
8.8 mm Pilkington **Optiphon™**	27	29	34	38	40	43	37 (0; -2)	37	37	35
10.8 mm Pilkington **Optiphon™**	26	30	35	39	40	46	38 (-1; -3)	38	37	35
12.8 mm Pilkington **Optiphon™**	29	32	36	41	42	51	40 (-1; -3)	40	39	37
16.8 mm Pilkington **Optiphon™**	31	33	38	41	43	54	41 (-1; -3)	41	40	38
Insulating glass units										
6 mm / 16 mm argon / 6.8 mm Pilkington **Optiphon™**	21	28	37	48	48	54	40 (-2; -6)	40	38	34
6 mm / 16 mm argon / 8.8 mm Pilkington **Optiphon™**	25	27	38	48	47	55	41 (-2; -6)	41	39	35
8 mm / 16 mm argon / 8.8 mm Pilkington **Optiphon™**	21	30	39	47	50	55	42 (-3; -8)	42	39	34
10 mm / 16 mm argon / 8.8 mm Pilkington **Optiphon™**	28	31	42	45	50	58	44 (-2; -6)	44	42	38
10 mm / 20 mm argon / 8.8 mm Pilkington **Optiphon™**	28	36	43	47	49	58	46 (-2; -6)	46	44	40
8.8 mm Pilkington **Optiphon™** / 16 mm argon / 12.8 mm Pilkington **Optiphon™**	28	36	45	53	56	64	48 (-2; -7)	48	46	41
10.8 mm Pilkington **Optiphon™** / 24 mm argon / 16.8 mm Pilkington **Optiphon™**	35	41	48	53	55	65	52 (-2; -6)	52	50	46
12.8 mm Pilkington **Optiphon™** / 20 mm argon / 16.8 mm Pilkington **Optiphon™**	35	45	49	50	54	65	51 (-1; -4)	51	50	47

Measurements undertaken in accordance with BS EN ISO 10140 and Rw (C; C_{tr}) determined in accordance with BS EN ISO 717-1.
For insulating glass units, there is little difference in the sound insulation for cavity widths in the range 6 to 16 mm.
To calculate performance data for Pilkington products, please use our Spectrum online calculator at https://spectrum.pilkington.com/
For glass combinations to achieve an R_w value higher than 52 dB, please contact us for more details.

© Mika Huisman

Sound insulation data for standard products

Glass	Sound reduction index (dB)									
	Octaveband Centre Frequency (Hz)						R_w (C; C_{tr})	R_w	R_w+C	R_w+C_{tr}
	125	250	500	1000	2000	4000				
Single glazing										
4 mm Float Glass	17	20	26	32	33	26	29 (-2; -3)	29	27	26
6 mm Float Glass	18	23	30	35	27	32	31 (-2; -3)	31	29	28
8 mm Float Glass	20	24	29	34	29	37	32 (-2; -3)	32	30	29
10 mm Float Glass	23	26	32	31	32	39	33 (-2; -3)	33	31	30
12 mm Float Glass	27	29	31	32	38	47	34 (0; -2)	34	34	32
6 mm Laminated Glass	20	23	29	34	32	38	32 (-1; -3)	32	31	29
8 mm Laminated Glass	20	25	32	35	34	42	33 (-1; -3)	33	32	30
10 mm Laminated Glass	24	26	33	33	35	44	34 (-1; -3)	34	33	31
12 mm Laminated Glass	24	27	33	32	37	46	35 (-1; -3)	35	34	32
16 mm Laminated Glass	26	31	30	35	43	51	36 (-1; -3)	36	35	33
Insulating glass units										
4 mm / (6 - 16 mm) / 4 mm	21	17	25	35	37	31	29 (-1; -4)	29	28	25
6 mm / (6 - 16 mm) / 4 mm	21	20	26	38	37	39	32 (-2; -4)	32	30	28
6 mm / (6 - 16 mm) / 6 mm	20	18	28	38	34	38	31 (-1; -4)	31	30	27
8 mm / (6 - 16 mm) / 4 mm	22	21	28	38	40	47	33 (-1; -4)	33	32	29
8 mm / (6 - 16 mm) / 6 mm	20	21	33	40	36	48	35 (-2; -6)	35	33	29
10 mm / (6 - 16 mm) / 4 mm	24	21	32	37	42	43	35 (-2; -5)	35	33	30
10 mm / (6 - 16 mm) / 6 mm	24	24	32	37	37	44	35 (-1; -3)	35	34	32
6 mm / (6 - 16 mm) / 6 mm Laminated	20	19	30	39	37	46	33 (-2; -5)	33	31	38
6 mm / (6 - 16 mm) / 10 mm Laminated	24	25	33	39	40	49	37 (-1; -5)	37	36	32

The above are generally accepted values for generic products taken from EN 12758. They are conservative values that can be used in the absence of measured data.
Data for laminated glass is based on pvb interlayers (excluding acoustic pvb interlayers). Glass thickness for laminated glass excludes interlayer thickness.
Data can be adopted for air or argon gas-filled cavities

Technical Definitions

Sound Reduction Index

R_w is the weighted sound reduction, in decibels, which incorporates a correction for the ear's response.

C and C_{tr} are the spectrum adjustments, which are the values added to R_w to take account of the characteristics of particular sound spectra. Typical noise sources for each spectrum adaptation terms are given below.

Relevant spectrum adaptation term C

Type of noise source:

- Living activities (talking, music, radio, TV)
- Children playing
- Railway traffic at medium and high speed
- Jet aircraft, short distance away
- Motorway traffic >50 mph
- Factories emitting mainly medium and high frequency noise.

Relevant spectrum adaptation term C_{tr}

Type of noise source:

- Urban road traffic
- Railway traffic at low speeds
- Aircraft, propeller driven
- Jet aircraft, long distance away
- Music with low frequency bass sounds
- Factory emitting mainly low and medium frequency noise.

This publication provides only a general description of the products. Further, more detailed, information may be obtained from your local supplier of Pilkington products. It is the responsibility of the user to ensure that the use of these products is appropriate for any particular application and that such use complies with all relevant legislation, standards, codes of practice and other requirements. To the fullest extent permitted by applicable laws, Nippon Sheet Glass Co. Ltd. and its subsidiary companies disclaim all liability for any error in or omission from this publication and for all consequences of relying on it. Pilkington, "Optiphon", "Optitherm", "K Glass", "Activ" and "Suncool" are trademarks owned by Nippon Sheet Glass Co. Ltd, or a subsidiary thereof.

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