

# SHARPS REDMORE

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## Report

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**Acoustic Assessment**  
for proposed development of  
the former Hotel Felix,  
Cambridge

**Prepared by**  
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## 1.0 Executive Summary

- 1.1 This report presents an assessment of noise in relation to a proposed 80-bed residential care home development at the Hotel Felix in Cambridge to assist with the planning application.
- 1.2 A noise survey has been carried out on the 14<sup>th</sup> and 15<sup>th</sup> December 2020 to establish the prevailing noise environment at the site.
- 1.3 This assessment considers national planning policy and guidance, including the NPPF and NPSE, as well as local planning policy contained within the Local Plan and the Greater Cambridge Supplementary Guidance (SPG) on Sustainable Design and Construction. The assessment is presented in accordance with the guidance of the ProPG: Planning and Noise.
- 1.4 An initial 'Stage 1' site risk assessment, as advocated by the ProPG, indicates that the site is **Low Risk** in terms of noise.
- 1.5 Proposed criteria for external plant at the nearest noise-sensitive receptors are shown in Table 1.1 below and should be assessed in accordance with the guidance of BS 4142:2014. The SPG also provides a general requirement for the rating level ( $L_{A,Tr}$ ) due to operational plant and equipment to not exceed the existing background sound level ( $L_{A90}$ ) at the site boundary.

**Table 1.1 Proposed criteria for external plant (at the nearest noise-sensitive receptors)**

Period	Criteria
Daytime (07:00 – 23:00)	$L_{A,Tr} \leq 51$ dB
Night-time (23:00 – 07:00)	$L_{A,Tr} \leq 46$ dB

- 1.6 Criteria have been specified for internal noise levels in accordance with the guidance of BS 8233:2014. It is calculated that the required indoor noise levels can be achieved with standard double-glazed windows (e.g. 4 (12) 6 mm) and with standard through-frame trickle ventilators (e.g. Greenwood 5000EA). This is with windows closed whilst providing minimum continuous ventilation. Further details and typical acoustic performance specifications are given in Section 7.0.
- 1.7 The site has been designed such that residents have access to external amenity areas where noise levels meet the range recommended within BS 8233:2014, such as within the enclosed communal courtyard areas. The survey showed noise levels of 59 dB  $L_{Aeq,16-hr}$  at the southern site boundary and as such external noise levels in some areas may exceed the criteria at times.
- 1.8 An 'Acoustic Design Statement' is included in Section 8.0 as recommended by the ProPG, and includes a recommendation to the decision maker, which demonstrates that the site is suitable for residential development.
- 1.9 In accordance with the guidance of the ProPG and the findings detailed within this report it is recommended that **planning consent may be granted subject to the inclusion of suitable noise conditions.**
- 1.10 The decision maker may wish to apply noise conditions to:
- demonstrate the scheme of sound insulation adopted achieves the recommended internal noise levels;
  - demonstrate that new building services plant meet the criteria recommended in Section 5.0.

## 2.0 Introduction

- 2.1 Sharps Redmore has been engaged by Cassel Hotels (Cambridge) Limited to provide an acoustic assessment to assist with the planning application for an 80-bed care home at the site of the former Hotel Felix in Cambridge.
- 2.2 The development will comprise the demolition and construction of the two-storey care home, and will also include residents' indoor and outdoor amenity areas as well as associated infrastructure, services and landscaping. Fig 2.1 shows site location. Architect's plans are also included in Appendix D which includes the proposed site plan
- 2.3 The Hotel Felix currently occupies the site, and the proposed development is situated in approximately the same position. The area is primarily residential with dwellings to the north and west, with fields and farm buildings also close-by.
- 2.4 The background noise climate is dominated by road traffic from the A14 to the north, and the M11 to the west.

**Figure 2.1 Site location**



### 3.0 Standards, Guidance, Policy & Legislation

3.1 The following section provides an overview of the key design standards and guidance relevant to the development.

#### National Policy

3.2 The National Planning Policy Framework (NPPF) was published in February 2019 to set out the Government's planning policies for England and how these should be applied. It provides a framework within which locally-prepared plans for housing and other development can be produced.

3.3 In relation to noise, Paragraph 180 of the NPPF states:

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

- 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.*

3.4 The Noise Policy Statement for England 2010 (NPSE) aims, through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development, to:

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

3.5 Planning practice guidance on noise (last updated July 2019) defines observed effect levels as follows:

- Significant observed adverse effect level: This is the level of noise exposure above which significant adverse effects on health and quality of life occur.
- Lowest observed adverse effect level: This is the level of noise exposure above which adverse effects on health and quality of life can be detected.
- No observed effect level: This is the level of noise exposure below which no effect at all on health or quality of life can be detected.

3.6 The guidance note summarises the noise exposure hierarchy, based on the likely average response, and recommended actions. The hierarchy is presented in Table 3.1 below.

**Table 3.1 NPSE guidance note noise exposure hierarchy**

Perception	Examples of outcomes	Increasing effect level	Action
No Observed Effect Level			
Not present	No effect	No Observed Effect	No specific measures required
No Observed Adverse Effect Level			
Present and not intrusive	Noise can be heard, but does not cause any change in behaviour, attitude or other physiological response. Can slightly affect the acoustic character of the area but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required
Lowest Observed Adverse Effect Level			
Present and intrusive	Noise can be heard and causes small changes in behaviour, attitude or other physiological response, e.g. turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a small actual or perceived change in the quality of life.	Observed Adverse Effect	Mitigate and reduce to a minimum
Significant Observed Adverse Effect Level			
Present and disruptive	The noise causes a material change in behaviour, attitude, or other physiological response, e.g. avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep, premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.	Significant Observed Adverse Effect	Avoid
Present and very disruptive	Extensive and regular changes in behaviour, attitude or other physiological response and/or an inability to mitigate effect of noise leading to psychological stress, e.g. regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, e.g. auditory and non-auditory.	Unacceptable Adverse Effect	Prevent

## Local Planning Policy

- 3.7 Current local policy can be found in the South Cambridgeshire Local Plan 2018 Policy SC/10: *Noise Pollution* and states:
1. Planning permission will not be granted for development which:
    - a. Has an unacceptable adverse impact on the indoor and outdoor acoustic environment of existing or planned development;
    - b. Has an unacceptable adverse impact on countryside areas of tranquillity which are important for wildlife and countryside recreation;
    - c. Would be subject to unacceptable noise levels from existing noise sources, both ambient levels and having regard to noise characteristics such as impulses whether irregular or tonal.
  2. Conditions may be attached to any planning permission to ensure adequate attenuation of noise emissions or to control the noise at source. Consideration will be given to the increase in road traffic that may arise due to development and conditions or Section 106 agreements may be used to minimise such noise.
  3. Where a planning application for residential development is near an existing noise source, the applicant will be required to demonstrate that the proposal would not be subject to an unacceptable noise levels both internally and externally.
  4. The Council will seek to ensure that noise from proposed commercial, industrial, recreational or transport use does not cause any significant increase in the background noise level at nearby existing noise sensitive premises which includes dwellings, hospitals, residential institutions, nursing homes, hotels, guesthouses, and schools and other educational establishments.
- 3.8 The *Greater Cambridge Supplementary Guidance (SPG) on Sustainable Design and Construction* (adopted January 2020) includes detailed guidance regarding criteria and assessment methodologies for developments to “ensure that the environmental and social impact on our area and communities is minimised”.
- 3.9 The SPG refers to the guidance of BS 8233:2014 and the WHO for suitable internal ambient noise level criteria, and the general approach of assessment described by the *ProPG: Planning and Noise Professional Practice Guidance on Planning and Noise*.
- 3.10 Noise generating developments (NGD) are required to be assessed in accordance with BS 4142:2014 and the SPG primarily discusses this in relation to industrial or commercial developments. However, this residential development is likely to include some external building services plant therefore it is appropriate to consider the noise impact on the nearest noise-sensitive locations.

## ProPG: Planning and Noise

- 3.11 Professional Practice Guidance on Planning and Noise (ProPG) was produced by the Chartered Institute of Environmental Health (CIEH), the Association of Noise Consultants (ANC) and the Institute of Acoustics (IOA) and published in May 2017. The guidance has been published to

provide practitioners with guidance on the management of noise within the planning system in England.

3.12 The guidance is specifically for ‘new residential development’ that would be exposed predominantly to noise from existing transport sources and reflects the Government’s overarching Noise Policy Statement for England (NPSE), the National Planning Policy Framework (NPPF), and Planning Practice Guidance (including PPG-Noise), as well as other sources of guidance.

3.13 The document provides advice for Local Planning Authorities (LPAs) and developers, and their respective professional advisers which complements Government planning and noise policy and guidance and, in particular, it aims to:

- Advocate full consideration of the acoustic environment from the earliest possible stage of the development control process;
- Encourage the process of good acoustic design in and around new residential developments;
- Outline what should be taken into account in deciding planning applications for new noise-sensitive developments;
- Promote appropriate noise exposure standards; and
- Assist the delivery of sustainable development.

3.14 There are two stages of the overall approach outlined in the ProPG:

- Stage 1 – an initial noise risk assessment of the proposed development site; and
- Stage 2 – a systematic consideration of 4 key elements which is underpinned by an Acoustic Design Statement (ADS).

3.15 The guidance is intended for sites where the dominant noise contribution is from transportation noise. It may also be appropriate for sites where industrial or commercial noise contributes to the noise climate, provided that it is not dominant.

### WHO Guidelines for Community Noise

3.16 The World Health Organisation (WHO) Guidelines for Community Noise evaluates a considerable number of studies into the adverse health effects of all sources of noise, with the exception of noise at the industrial workplace. The document provides also guideline values for specific health effects in specific environments, such as in dwellings. The criteria relevant to this development are presented in Table 3.2 below and are used to inform other standards and guidance, such as BS 8233:2014.

**Table 3.2 WHO guideline values for community noise**

Specific environment	Critical health effects	$L_{Aeq}$ (dB)	Time base (hrs)	$L_{Amax,fast}$ (dB)
Outdoor living area	Serious annoyance, daytime and evening	55	16	-
	Moderate annoyance, daytime and evening	50	16	-
Dwelling, indoors	Speech intelligibility & moderate annoyance, daytime and evening	35	16	-
Inside bedrooms	Sleep disturbance, night-time	30	8	45



- 3.17 WHO Guidelines state that the indoor sound pressure levels should not exceed approximately 45 dB  $L_{Amax}$  more than 10-15 times per night.

**British Standard 8233:2014**

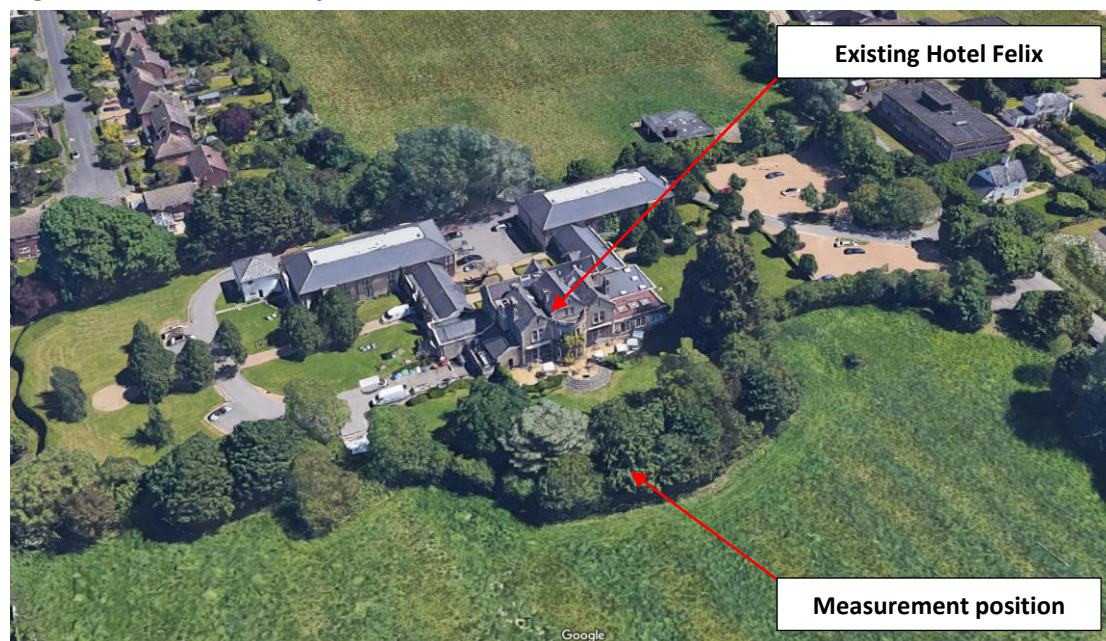
- 3.18 This standard provides general guidance for the control of noise in and around buildings and is applicable to the design of a variety of buildings, both new and those undergoing refurbishments. It draws on the guidance of a number of other standards to provide typical criteria for the acoustic performance of buildings, noise mitigation methods, example acoustic performance of common materials and general construction advice.
- 3.19 Criteria described within BS 8233:2014 are consistent with those included within the WHO guidance, and are presented in detail in Section 7.0.

## 4.0 Noise Survey

### Survey Methodology

- 4.1 A noise survey was undertaken at the proposed site for a 24-hour period during the 14<sup>th</sup> and 15<sup>th</sup> December 2020 to determine the prevailing noise environment and to identify suitable limits for any proposed building services plant.
- 4.2 The sound level meter was left unattended with measurements logged every 15 minutes in octave frequency bands. Maximum sound pressure levels were logged over each one-minute period.
- 4.3 Measurements were carried out at the site close to the south-west boundary, as shown in Figure 4.1. The position was chosen to be away from potential noise sources at nearby residences whilst still being subject to the dominant noise sources, and is representative of existing and proposed receptors.
- 4.4 The sound level meter was Class 1 type and calibrated to national standards. Calibration certificates are available on request. Measurement equipment was field calibrated before and after measurement with no significant drift observed.
- 4.5 The weather conditions during the survey were dry with temperatures ranging between 12°C and 6°C. The average wind speeds were less than 1 ms<sup>-1</sup>. Measurements are therefore considered to have not been adversely affected by the wind.
- 4.6 The sound level meter was approximately 2 m above ground and situated away from significant reflective surfaces such that measurements could be considered free-field.

**Figure 4.1 Measurement position**



### Survey Results

- 4.7 The dominant noise at the site is road traffic noise from the M11 to the west and the A14 to the north. Other noise contributions at the site were road traffic from Huntingdon Road and distant construction noise, which contributed to sound maxima during the daytime.

- 4.8 A summary of the survey results is presented in Table 4.1 below. Table 4.2 provides representative frequency spectra for the daytime and night-time periods. These levels have been used to calculate noise ingress (see Section 5.0).

**Table 4.1 Summary of survey results**

Period	$L_{Aeq}$ (dB)	Typical $L_{AFmax}$ (dB)	$L_{A10}$ (dB)	$L_{A90}$ (dB)
Daytime (16 hours)	59	-	60	56
Night-time (8 hours)	53	62	55	51

**Table 4.2 Representative frequency spectra**

Period	Metric	Octave band centre frequency sound pressure level (dB)						
		63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz
Daytime	$L_{eq,16-hour}$	60	53	52	54	57	48	39
Night-time	$L_{eq,8-hour}$	52	43	45	50	52	40	27
Night-time	Typical $L_{AFmax}$	67	55	55	58	61	50	41

- 4.9 A full table of measured survey data is included in Appendix A, with charts in Appendix B.

## 5.0 Noise Impact on External Receptors

- 5.1 The SPG requires the assessment of new noise-generating sources to minimise the impact on nearby noise-sensitive receptors and refers to the guidance of BS 4142:2014.
- 5.2 In the absence of numerical values within the NPPF for the different noise effect levels the SPG outlines the criteria for NGD as shown in Table 5.1.

**Table 5.1 SPG external noise standards for “non-anonymous noise”**

Noise significance risk	Noise significance of effect	BS 4142 outcome: Rating level ( $L_{A,Tr}$ ) minus background level ( $L_{A90}$ )	Planning advice
None	NOEL	$L_{A,Tr} - L_{A90,T} < -10$	Sound is likely to be inaudible and have no discernible impact on health or quality of life. No objection from a noise perspective and no specific noise measures required.
Minimal	NOEL to LOAEL	$-10 < L_{A,Tr} - L_{A90,T} < -5$	Where the rating level of noise is below the background noise level by at least 5 dB, this indicates that the proposed NGD is likely to be acceptable from a noise perspective. The LPA will seek this level of compliance in most noise sensitive areas and/or where there is a requirement to mitigate creeping background effects.
Low	NOEL to LOAEL	$-5 < L_{A,Tr} - L_{A90,T} < 0$	Where the rating level of noise is equal to, or below the background noise level by up to 5 dB, this indicates that the proposed NGD may be acceptable from a noise perspective but will be more context dependent, i.e. extent and effect on noise sensitive receivers (externally and internally). Compliance within this range is more applicable to less sensitive sites or where there is no requirement to mitigate creeping background effects.
Medium	LOAEL to SOEL	$0 < L_{A,Tr} - L_{A90,T} < +5$	Where the rating level of noise is equal to, or above the background noise level by up to 5 dB, this indicates that the proposed NGD is less likely to be acceptable from a noise perspective and will be context dependent, i.e. extent and effect on noise sensitive receivers (externally and internally). Compliance within this range is typically only applicable to non-sensitive sites or where there are overriding other reasons why development should be considered. It will typically be necessary for the applicant to confirm how adverse impacts from the NGD will be mitigated and minimised. It is less likely that planning consent will be granted. Acceptable only if there are overriding economic or social reasons for development to proceed.

Noise significance risk	Noise significance of effect	BS 4142 outcome: Rating level ( $L_{A,Tr}$ ) minus background level ( $L_{A90}$ )	Planning advice
High	SOEL	$+5 < L_{A,Tr} - L_{A90,T} < +10$	Where the rating level of noise is above the background noise level by more than 5 dB, this indicates that the proposed NGD is unlikely to be acceptable from a noise perspective and planning consent is likely to be refused on noise grounds.
Very high	SOEL and unacceptable	$L_{A,Tr} - L_{A90,T} > +10$	Where the rating level of noise is above the background noise level by more than 10 dB, this indicates that the proposed NGD is unacceptable from a noise perspective and planning consent shall be refused on noise grounds.

- 5.3 It is understood that the development could include external plant such as ventilation and heating/cooling plant. Specific details are not available at this stage though noise criteria can be provided based on the results of the survey.
- 5.4 Once suitable information is available regarding external plant, a noise impact assessment should be carried out in accordance with the methodology described by BS 4142:2014.
- 5.5 Proposed criteria are provided in Table 5.2 below and are based on a 'minimal noise significance risk' and where there is a requirement to mitigate creeping background effects.

**Table 5.2 Proposed criteria for external plant (noise-sensitive receptors)**

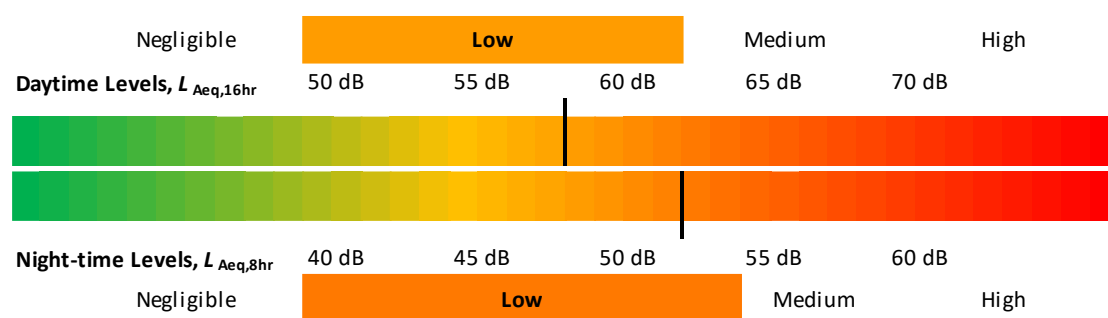
Period	Criteria
Daytime (07:00 – 23:00)	$L_{A,Tr} \leq 51$ dB
Night-time (23:00 – 07:00)	$L_{A,Tr} \leq 46$ dB

- 5.6 The rating noise level (or  $L_{A,Tr}$ ) is calculated externally at nearby noise-sensitive receptors and must include consideration of distinguishable noise characteristics.
- 5.7 Furthermore the SPG also provides a general requirement for the rating level ( $L_{A,Tr}$ ) due to operational plant and equipment to not exceed the existing background sound level ( $L_{A90}$ ) at the site boundary. This must be assessed over a one-hour period during the daytime, and over a 15-minute period during the night.
- 5.8 Measured background sound levels in 15-minute periods are presented in Appendix A.

## 6.0 ProPG: Stage 1 Initial Risk Assessment

- 6.1 Stage 1 of the ProPG assessment requires an initial risk assessment of the site to be undertaken and is intended to provide the developer, the noise practitioner and decision makers an early indication of the suitability of the site for new residential development.
- 6.2 The Stage 1 assessment of noise risk is not the basis for the eventual recommendation to the decision maker.
- 6.3 Existing noise levels at the site are assessed without inclusion of the acoustics effects of any scheme-specific mitigation measures.
- 6.4 The existing noise levels measured at the site are evaluated on the 'risk ribbon' shown below.

**Figure 6.1 ProPG Site Risk Assessment**



- 6.5 Based on the results of the noise survey and the methodology described by ProPG, the proposed development is considered '**Low Risk**'.
- 6.6 At low risk levels, the site is likely to be acceptable from a noise perspective provided that a good acoustic design process is followed and is demonstrated in an Acoustic Design Statement (ADS) which confirms how the adverse impacts of noise will be mitigated and minimised in the finished development.

## 7.0 ProPG Stage 2: Detailed Assessment

7.1 Stage 2 of the ProPG assessment (which is not required if the Stage 1 assessment concludes a negligible risk) stipulates four key elements to be considered:

- Element 1 – demonstrate a “Good Acoustic Design Process”;
- Element 2 – observe internal “Noise Level Guidelines”;
- Element 3 – undertake an “External Amenity Area Noise Assessment”;
- Element 4 – consider “Other Relevant Issues”.

7.2 Each design element is addressed in the following sections.

### Good Acoustic Design Process

7.3 The proposed building is situated in a similar position to the existing Hotel Feilx, with a distance of 44 m between residences to the west and 27 m from dwellings to the north.

7.4 The most sensitive rooms (bedrooms) are placed away from the car park and main entrance, separated by non-residential spaces, such as communal spaces, offices, kitchen and foyer. The position of the proposed building will screen noise from the car park in the residents’ gardens.

7.5 ProPG acknowledges that where noise-sensitive developments are proposed in noisy locations there is a limit to the extent to which good acoustic design can be achieved and that it may not always be possible to achieve acoustic standards with windows open or accepting that noise levels in parts of the outdoor amenity areas may not be optimal. In such cases suitable living conditions, in line with the guidance in BS 8233:2014, can still be achieved by using the building envelope to control noise levels.

7.6 In relation to this application, good acoustic design measures have been implemented where practicable. Internal noise levels will be achieved using the building envelope.

7.7 Good Acoustic Design can also be incorporated into internal acoustic elements, such as sound insulation and absorption in common areas. Minimum standards for these are a requirement of the Building Regulations.

### Internal Noise Level Guidelines

7.8 Criteria for the indoor ambient noise level are specified in accordance with the guidance of the WHO, and are consistent with current British Standards and guidance, as well as local planning guidance.

7.9 The criteria presented in Table 7.1 are intended for steady external sources without a specific character, such as road traffic noise.

**Table 7.1 Criteria for the internal noise level within dwellings**

Activity	Location	0700 to 2300 hrs	2300 to 0700 hrs
Resting	Living room	35 dB $L_{Aeq,16hour}$	-
Dining	Dining room/area	40 dB $L_{Aeq,16hour}$	-
Sleeping (daytime resting)	Bedroom	35 dB $L_{Aeq,16hour}$	30 dB $L_{Aeq,8hour}$

- 7.10 Regular individual noise events can cause sleep disturbance and consequently a limit of 45 dB  $L_{Amax,fast}$  is proposed during the night-time period. Individual noise events must not exceed this limit more than 10 times per night.
- 7.11 Using a reduction of 15 dB(A) for a partially open window and the external noise levels identified from the survey in Table 4.1, it can be seen that the criteria specified above would not be achieved (see Table 7.2) for all noise sensitive rooms within the site.

**Table 7.2 Internal noise level with open window**

Period	Parameter	External level	Reduction for open window	Internal level
Daytime	$L_{Aeq,16-hr}$ (dB)	59	-15 dB(A)	44
Night-time	$L_{Aeq,8-hr}$ (dB)	53	-15 dB(A)	38
Night-time	Typical $L_{Amax,F}$ (dB)	62	-15 dB(A)	47

- 7.12 In the experience of Sharps Redmore however, open windows cannot be relied upon for the provision of minimum rates of ventilation, nor are open windows a ventilation strategy described by Approved Document F of the Building Regulations for this purpose.
- 7.13 Alternative indoor ambient noise level criteria are acceptable in situations where higher ventilation rates are required for extract or purge ventilation, or for the control of overheating. These are situations where open windows are typically utilised for ventilation.
- 7.14 This does not preclude openable windows which are operated by the occupant as desired; indeed, it is encouraged that occupants have the choice to open windows or not.
- 7.15 To determine suitable acoustic performance specifications for the building envelope, noise ingress calculations have been carried out in accordance with the methods and procedures described by BS 8233:2014 and BS 12354-3:2000. Room dimensions have been taken from the Architect's drawings.
- 7.16 Assumptions relating to the ventilation strategy are necessary to determine appropriate acoustic performance standards. Assumptions and references do not constitute a ventilation strategy which should be verified by a qualified person.
- 7.17 It is calculated that the above criteria for internal ambient noise can be achieved using one of the window and ventilator configurations presented in Table 7.3 and Table 7.4.
- 7.18 It is calculated that the required indoor noise levels can be achieved with standard double-glazed windows and with standard through-frame trickle ventilators. This is with windows closed whilst providing minimum continuous ventilation.
- 7.19 Other window and/or ventilator selections may be suitable, but should be verified by the acoustician once final selections have been made.



**Table 7.3 Example window and ventilator configurations**

Location	AD-F Ventilation Strategy*	Ventilator(s)	Window(s)
All façades	System 1: Background ventilators and intermittent extract fans	Up to 5 no. standard through-frame trickle vent, e.g. Greenwood 5000EA	Standard thermal double glazing, e.g. 4 (12) 6 mm
	System 3: Continuous mechanical extract (MEV)	Single standard through-frame trickle vent, e.g. Greenwood 5000EA	Standard thermal double glazing, e.g. 4 (12) 6 mm
	System 4: Mechanical ventilation and heat recovery (MVHR)	None required	Standard thermal double glazing, e.g. 4 (12) 6 mm

\* when providing continuous minimum ventilation

**Table 7.4 Example window and ventilator acoustic performance**

Element	Parameter	Octave-band centre frequency						Single-figure ISO 717-1 performance
		125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	
Window	$R$ (dB)	27	23	27	39	40	41	<b>33 (-4) dB <math>R_w</math> (<math>C_{tr}</math>)</b>
Ventilator	$D_{n,e}$ (dB)	40	37	36	32	31	34	<b>33 dB <math>D_{n,e,w}</math></b>

- 7.20 The sound insulation performance given for windows includes the glazing, seals and frame. Suppliers should provide evidence (e.g. laboratory test certificates) which demonstrates that the windows and ventilators can achieve the values specified.
- 7.21 Only the windows and ventilators are considered at this stage as they are the weakest element of the façade. It is anticipated that external walls will offer a significantly better acoustic performance than the windows and ventilators and noise ingress via external walls will be negligible when compared to the windows/ventilators.
- 7.22 Bedrooms facing the internal courtyard which benefit from acoustic screening by the proposed building are likely to achieve internal criteria with windows open.
- 7.23 Example noise ingress calculations are included in Appendix C.

### External Amenity Area Noise Assessment

- 7.24 Criteria for noise levels in external areas are specified in accordance with the guidance of the WHO, and are consistent with current British Standards and guidance, as well as planning practice and guidance.
- 7.25 BS 8233:2014 states that *“the acoustic environment of external amenity areas that are an intrinsic part of the overall design should always be assessed and noise levels should ideally not be above the range 50 – 55 dB  $L_{Aeq,16hr}$ ”*. The standards continues... *“These guideline values may not be achievable in all circumstances where a development might be desirable. In such a situation, development should be designed to achieve the lowest practicable noise levels in the external amenity spaces but should not be prohibited.”*

- 7.26 The Planning Practice Guidance on Noise, published on [planningportal.gov.uk](http://planningportal.gov.uk), gives further consideration relating to mitigating the impact of noise on residential developments and considers that noise may be partially off-set if residents of the dwellings have access to:
- A relatively quiet façade (containing windows to habitable rooms as part of their dwelling);
  - A relatively quiet external amenity space for their sole use such as a balcony which is generally considered as desirable.
  - A relatively quiet nearby external space for use by a number of residents as part of the amenity of their dwellings, and/or;
  - A relatively quiet external, publicly accessible amenity space that is nearby (e.g. within a 5-minute walk)
- 7.27 The development includes substantial external grounds which may be classed as ‘external amenity areas’ as shown on the proposed site plan, included in Appendix D.
- 7.28 The results of the survey showed that external daytime noise levels were measured to be 59 dB  $L_{Aeq,16hr}$  at the measurement position along the south western site boundary. This is slightly higher than the guideline range recommended by BS 8233:2014, but is not unacceptable considering the proximity to the surrounding strategic highway routes.
- 7.29 Nevertheless, the development provides a large communal amenity courtyard, enclosed by the building which residents will be able to access. Noise (from external sources e.g. road traffic) within this space are likely to not exceed 50 dB  $L_{Aeq,16-hr}$  due to the screening effect of the building.

### **Other Relevant Issues**

- 7.30 It is considered that there are no other relevant issues.

## 8.0 ProPG: Acoustic Design Statement

- 8.1 The Stage 1 initial risk assessment found that the proposed development is '**Low Risk**' based on the results of the environmental noise survey and the methodology described by ProPG. Existing acoustic conditions are dominated by road traffic noise.
- 8.2 Because the scale, position and nature of the development is very similar to the existing Hotel Feilx, it is anticipated that post-development noise levels at the site would remain broadly consistent with prior levels.
- 8.3 Good acoustic design has been used to create a screened external amenity courtyard area enclosed by the proposed building, and to distance bedrooms from the car park.
- 8.4 Appropriate internal noise levels, as recommended by BS 8233:2014, can be achieved with standard double glazing and standard through-frame trickle ventilators. As ventilation is required to be provided continuously, internal noise criteria are achieved with windows closed. Detailed acoustic performance requirements for windows and ventilators are specified in Section 7.0.
- 8.5 Acoustic performance requirements for façade elements are calculated such that maximum noise events greater than 45 dB  $L_{Amax}$  do not occur more than 10 times per night.
- 8.6 Bedrooms facing the internal courtyard which benefit from acoustic screening by the proposed building are likely to achieve internal criteria with windows open.
- 8.7 Although recommended internal noise level criteria would be exceeded in the most-exposed bedrooms when opening windows, it is considered that openable windows are acceptable (e.g. for purge ventilation) and as preferred by the occupant.
- 8.8 The development includes a large courtyard garden, enclosed by the proposed building where noise from external sources are likely to achieve the recommended criteria of no greater than 50 – 55 dB  $L_{Aeq,16-hr}$  due to the screening effect of the building.
- 8.9 The results of the survey showed that external daytime noise levels were measured to be 59 dB  $L_{Aeq,16hr}$  at the measurement position. As such noise levels in some areas would exceed the range recommended by BS 8233:2014, but is not considered excessive.
- 8.10 The occupants of the care home have access to areas which meet the recommended acoustic standards, both inside and outside, and could exercise choice regarding the acoustic conditions to which they are exposed, including duration. This would include being able to balance their acoustic environment with other elements.
- 8.11 Based on the outcomes of this report, the proposed development will comply with the national policy aims of the NPPF, and local policy aims of the SPG.

## **Recommendation to the Decision Maker**

- 8.12** In accordance with the guidance of the ProPG and the findings detailed within this report it is recommended that **planning consent may be granted subject to the inclusion of suitable noise conditions.**
- 8.13 The decision maker may wish to apply noise conditions to:
- demonstrate the scheme of sound insulation adopted achieves the recommended internal noise levels;
  - demonstrate that new building services plant meet the criteria recommended in Section 5.0.

# APPENDIX A

## Survey Data

**Table A1 Noise Survey Data**

<b>Date and time</b>	<b>L<sub>Aeq,15min</sub> (dB)</b>	<b>L<sub>AFmax,15min</sub> (dB)</b>	<b>L<sub>A10,15min</sub> (dB)</b>	<b>L<sub>A90,15min</sub> (dB)</b>
14/12/2020 11:30	59	73	60	57
14/12/2020 11:45	59	74	60	56
14/12/2020 12:00	58	63	60	57
14/12/2020 12:15	59	66	60	57
14/12/2020 12:30	58	62	60	56
14/12/2020 12:45	68	85	70	57
14/12/2020 13:00	58	65	60	56
14/12/2020 13:15	64	82	67	57
14/12/2020 13:30	58	62	59	57
14/12/2020 13:45	58	71	60	56
14/12/2020 14:00	57	62	59	56
14/12/2020 14:15	58	75	59	56
14/12/2020 14:30	58	72	60	57
14/12/2020 14:45	58	67	59	57
14/12/2020 15:00	58	61	59	56
14/12/2020 15:15	59	76	59	56
14/12/2020 15:30	58	65	59	56
14/12/2020 15:45	58	73	59	57
14/12/2020 16:00	58	73	59	57
14/12/2020 16:15	58	69	59	57
14/12/2020 16:30	59	73	59	57
14/12/2020 16:45	58	69	59	57
14/12/2020 17:00	58	61	59	56
14/12/2020 17:15	58	63	59	56
14/12/2020 17:30	57	61	58	56
14/12/2020 17:45	57	62	58	56
14/12/2020 18:00	57	61	58	56
14/12/2020 18:15	57	72	58	55
14/12/2020 18:30	56	60	57	54
14/12/2020 18:45	55	59	56	53
14/12/2020 19:00	55	60	56	54
14/12/2020 19:15	55	59	56	53
14/12/2020 19:30	55	59	56	53
14/12/2020 19:45	54	61	56	52
14/12/2020 20:00	54	59	55	52

Date and time	$L_{Aeq,15min}$ (dB)	$L_{AFmax,15min}$ (dB)	$L_{A10,15min}$ (dB)	$L_{A90,15min}$ (dB)
14/12/2020 20:15	54	58	55	52
14/12/2020 20:30	54	60	55	52
14/12/2020 20:45	53	58	55	51
14/12/2020 21:00	52	59	54	50
14/12/2020 21:15	52	57	53	49
14/12/2020 21:30	52	60	54	50
14/12/2020 21:45	52	58	54	50
14/12/2020 22:00	52	59	54	50
14/12/2020 22:15	52	60	54	49
14/12/2020 22:30	52	64	54	48
14/12/2020 22:45	51	58	53	48
14/12/2020 23:00	51	58	53	47
14/12/2020 23:15	51	60	53	47
14/12/2020 23:30	50	57	53	46
14/12/2020 23:45	50	58	52	47
15/12/2020 00:00	50	58	52	46
15/12/2020 00:15	48	59	51	44
15/12/2020 00:30	49	58	51	46
15/12/2020 00:45	48	58	51	44
15/12/2020 01:00	49	57	51	45
15/12/2020 01:15	48	56	51	45
15/12/2020 01:30	48	56	51	45
15/12/2020 01:45	49	57	51	46
15/12/2020 02:00	49	58	52	46
15/12/2020 02:15	49	58	51	46
15/12/2020 02:30	49	57	51	45
15/12/2020 02:45	51	59	53	47
15/12/2020 03:00	50	60	53	46
15/12/2020 03:15	51	58	54	46
15/12/2020 03:30	50	62	53	47
15/12/2020 03:45	50	58	52	47
15/12/2020 04:00	50	59	52	46
15/12/2020 04:15	51	58	53	47
15/12/2020 04:30	52	59	54	50
15/12/2020 04:45	52	63	53	49
15/12/2020 05:00	54	60	56	51

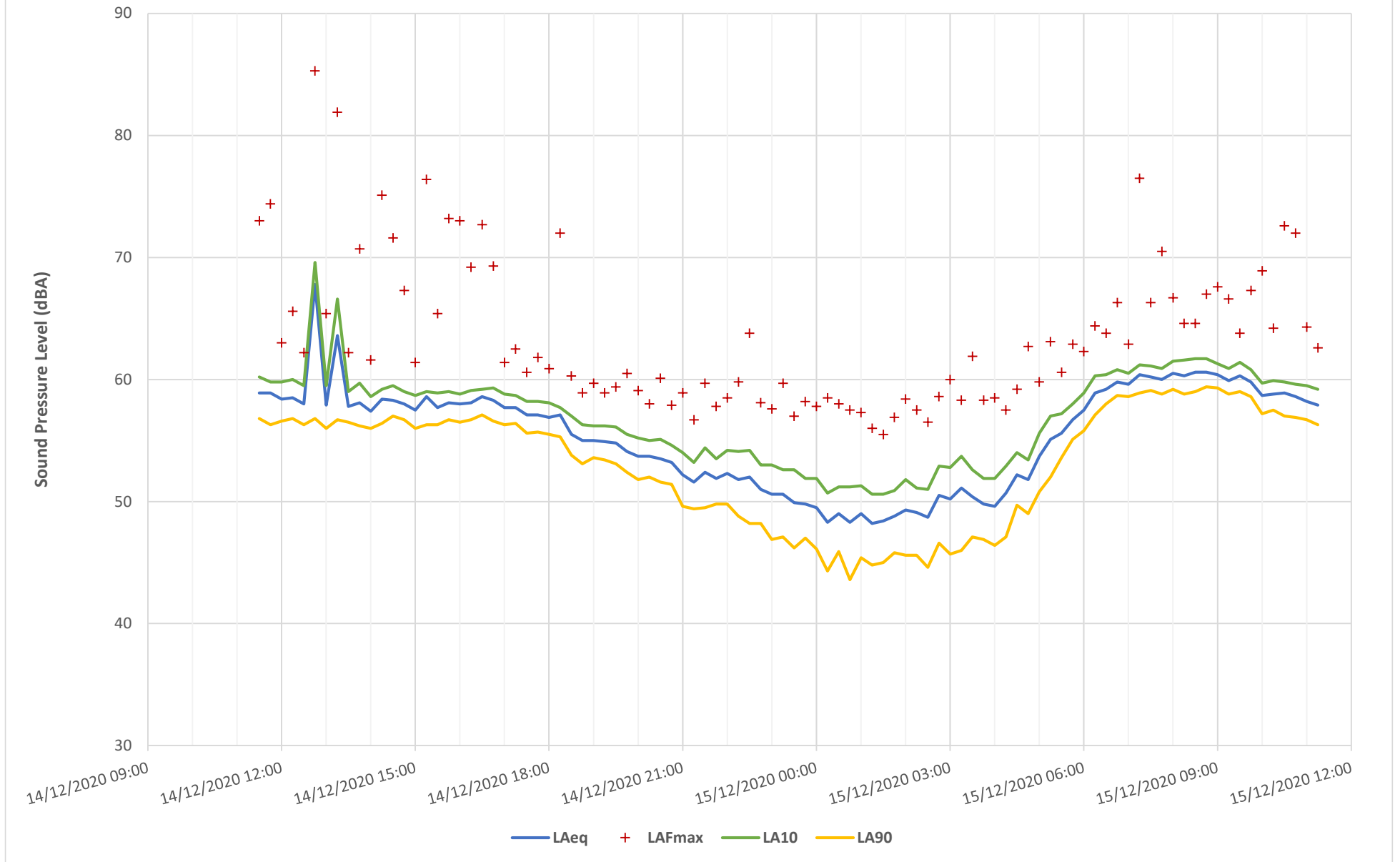
Date and time	$L_{Aeq,15min}$ (dB)	$L_{AFmax,15min}$ (dB)	$L_{A10,15min}$ (dB)	$L_{A90,15min}$ (dB)
15/12/2020 05:15	55	63	57	52
15/12/2020 05:30	56	61	57	54
15/12/2020 05:45	57	63	58	55
15/12/2020 06:00	58	62	59	56
15/12/2020 06:15	59	64	60	57
15/12/2020 06:30	59	64	60	58
15/12/2020 06:45	60	66	61	59
15/12/2020 07:00	60	63	61	59
15/12/2020 07:15	60	77	61	59
15/12/2020 07:30	60	66	61	59
15/12/2020 07:45	60	71	61	59
15/12/2020 08:00	61	67	62	59
15/12/2020 08:15	60	65	62	59
15/12/2020 08:30	61	65	62	59
15/12/2020 08:45	61	67	62	59
15/12/2020 09:00	60	68	61	59
15/12/2020 09:15	60	67	61	59
15/12/2020 09:30	60	64	61	59
15/12/2020 09:45	60	67	61	59
15/12/2020 10:00	59	69	60	57
15/12/2020 10:15	59	64	60	58
15/12/2020 10:30	59	73	60	57
15/12/2020 10:45	59	72	60	57
15/12/2020 11:00	58	64	60	57
15/12/2020 11:15	58	63	59	56



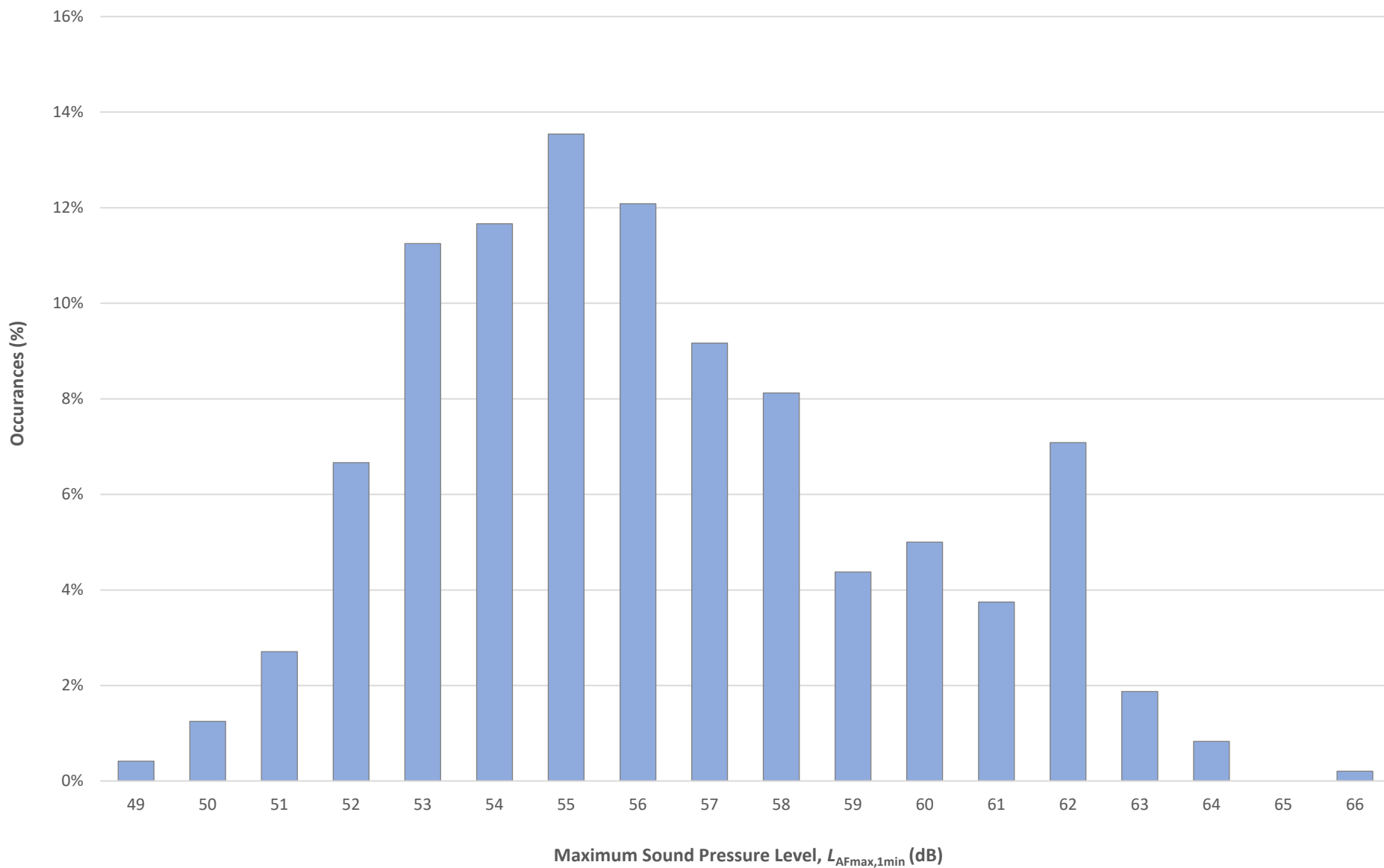
# APPENDIX B

## Survey Charts

### Survey Time-History Chart



$L_{AFmax}$  Frequency Distrubution Chart



## **APPENDIX C**

### **Noise Intrusion Calculations**

**NOISE INTRUSION CALCULATION**

ROOM: Typical bedroom

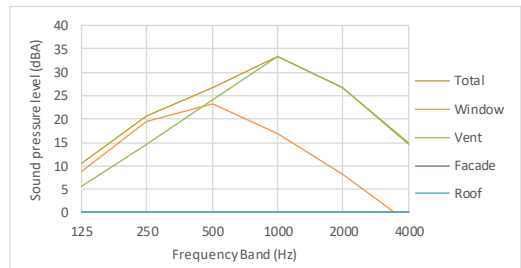
Raw Data	125	250	500	1000	2000	4000	L <sub>eq</sub>	weight	Shift?	Façade Correction?
L <sub>eq,16hr</sub> measured data (dB)	53	52	54	57	48	39	61	Yes	0.0	No (free-field measurement)
L <sub>eq,8hr</sub> measured data (dB)	43	45	50	52	40	27	55	Yes	0.0	No (free-field measurement)
L <sub>max</sub> measured data (dB)	55	55	58	61	50	41	64	Yes	0.0	No (free-field measurement)

Frequency dependent terms	125	250	500	1000	2000	4000	L <sub>req</sub>
Free-field 16hr day L <sub>req,ff</sub> (dBA)	37	43	51	57	49	40	59
Free-field 8hr night L <sub>req,ff</sub> (dBA)	27	36	46	52	41	28	53
Free-field 8hr night L <sub>max,ff</sub> (dBA)	39	46	55	61	51	42	62
Reveration Time, T <sub>60</sub> (s)	0.5	0.5	0.5	0.5	0.5	0.5	0.5

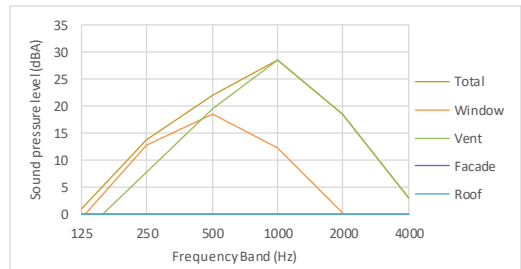
Non frequency dependent terms	
Room Volume, V (m <sup>3</sup> )	43.4
Facade Area, S <sub>f</sub> (m <sup>2</sup> )	
Window Area, S <sub>w</sub> (m <sup>2</sup> )	5.8
Facade Area excl. window, S <sub>ew</sub> (m <sup>2</sup> )	10.0
Ceiling Area, S <sub>c</sub> (m <sup>2</sup> )	
Number of trickle vents	5

Element	Element description	Octave-band Centre Frequency (Hz)					
		125	250	500	1000	2000	4000
Glazing, R <sub>wi</sub> (dB)	Saint Gobain Glass 4 (12) 6	27	23	27	39	40	41
Trickle vent, D <sub>n,e</sub> (dB)	Greenwood 5000EA	40	37	36	32	31	34
Facade, R <sub>ew</sub> (dB)							
Ceiling/roof, R <sub>r</sub> (dB)							

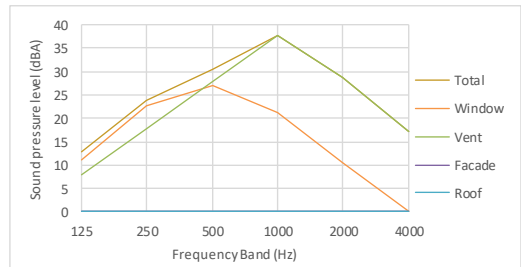
Daytime L <sub>eq</sub>	Octave-band Centre Frequency (Hz)	L <sub>eq</sub> (dBA)			
			125	250	500
Free-field 16hr day L <sub>eq,1</sub> (dBA)		59			
Glazing R <sub>wi</sub> (dB)	Saint Gobain Glass 4 (12) 6				
Glazing break-in, (dBA)		26			
Trickle vent D <sub>n,e</sub> (dB)	Greenwood 5000EA				
Trickle vent break-in, (dBA)		35			
Facade R <sub>ew</sub> (dB)	Facade break-in, (dBA)				
Ceiling/roof R <sub>r</sub> (dB)	Ceiling/roof break-in, (dBA)				
TOTAL BREAK-IN, L <sub>eq,2</sub> (dBA)		35			



Night-time L <sub>eq</sub>	Octave-band Centre Frequency (Hz)	L <sub>eq</sub> (dBA)			
			125	250	500
Free-field 8hr night L <sub>eq,1</sub> (dBA)		53			
Glazing R <sub>wi</sub> (dB)	Saint Gobain Glass 4 (12) 6				
Glazing break-in, (dBA)		20			
Trickle vent D <sub>n,e</sub> (dB)	Greenwood 5000EA				
Trickle vent break-in, (dBA)		29			
Facade R <sub>ew</sub> (dB)	Facade break-in, (dBA)				
Ceiling/roof R <sub>r</sub> (dB)	Ceiling/roof break-in, (dBA)				
TOTAL BREAK-IN, L <sub>eq,2</sub> (dBA)		30			



Night-time L <sub>max</sub>	Octave-band Centre Frequency (Hz)	L <sub>max</sub> (dBA)			
			125	250	500
Free-field 8hr night L <sub>max,1</sub> (dBA)		62			
Glazing R <sub>wi</sub> (dB)	Saint Gobain Glass 4 (12) 6				
Glazing break-in, (dBA)		29			
Trickle vent D <sub>n,e</sub> (dB)	Greenwood 5000EA				
Trickle vent break-in, (dBA)		39			
Facade R <sub>ew</sub> (dB)	Facade break-in, (dBA)				
Ceiling/roof R <sub>r</sub> (dB)	Ceiling/roof break-in, (dBA)				
TOTAL BREAK-IN, L <sub>eq,2</sub> (dBA)		39			



**APPENDIX D**  
**Architect's Drawings**



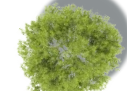





**SCHEDULE OF ACCOMMODATION**

SITE AREA	1.39 Ha (3.43 acres)
CARE HOME	
GROUND FLOOR	40 BEDS + SERVICE AREAS
FIRST FLOOR	40 BEDS + SPA
ROOF SPACE	SERVICE AREAS
<b>TOTAL</b>	<b>80 BEDROOMS</b>
<b>GROSS INTERNAL FLOOR AREA</b>	
GROUND FLOOR	2,250m <sup>2</sup>
FIRST FLOOR	2,085m <sup>2</sup>
ROOF SPACE	260m <sup>2</sup>
<b>TOTAL GIFA:</b>	<b>4,595m<sup>2</sup></b>
SPACE PER RESIDENT	57.4m <sup>2</sup>
PARKING	30 BAYS INCL. 2 DISABLE BAYS

**KEY**

-  EXISTING TREES
-  REMOVED TREES
-  PROPOSED TREES
-  EXISTING TREES WITH TPO ORDER

P8	BUILDING FOOTPRINT AND LANDSCAPE AMENDED	PK	MM	07.10.2020
P7	SCHEDULE OF ACCOMMODATION AMENDED	PK	MM	17.06.2020
P6	SCHEDULE OF ACCOMMODATION AMENDED	PK	MM	15.05.2020
P5	LANDSCAPING ADDED	PK	MM	12.05.2020
P4	TREES WITH TPO ORDER MARKED ON THE PLAN	PK	MM	05.05.2020
P3	TREE SURVEY ADDED	PK	MM	01.05.2020
P2	AMENDED IN LINE WITH CLIENT'S COMMENTS	PK	MM	08.04.2020
P1	ISSUED TO CLIENT FOR COMMENTS	PK	MM	31.03.2020

Rev.	Description	Author	Checked	Date
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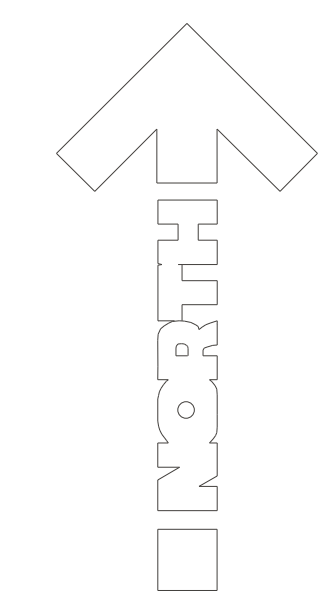
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Title: SITE PLAN C+A no. A-846

scale: 1:500 author: PK chkd: MM date: Sep. 22, 20 sheet size: A1

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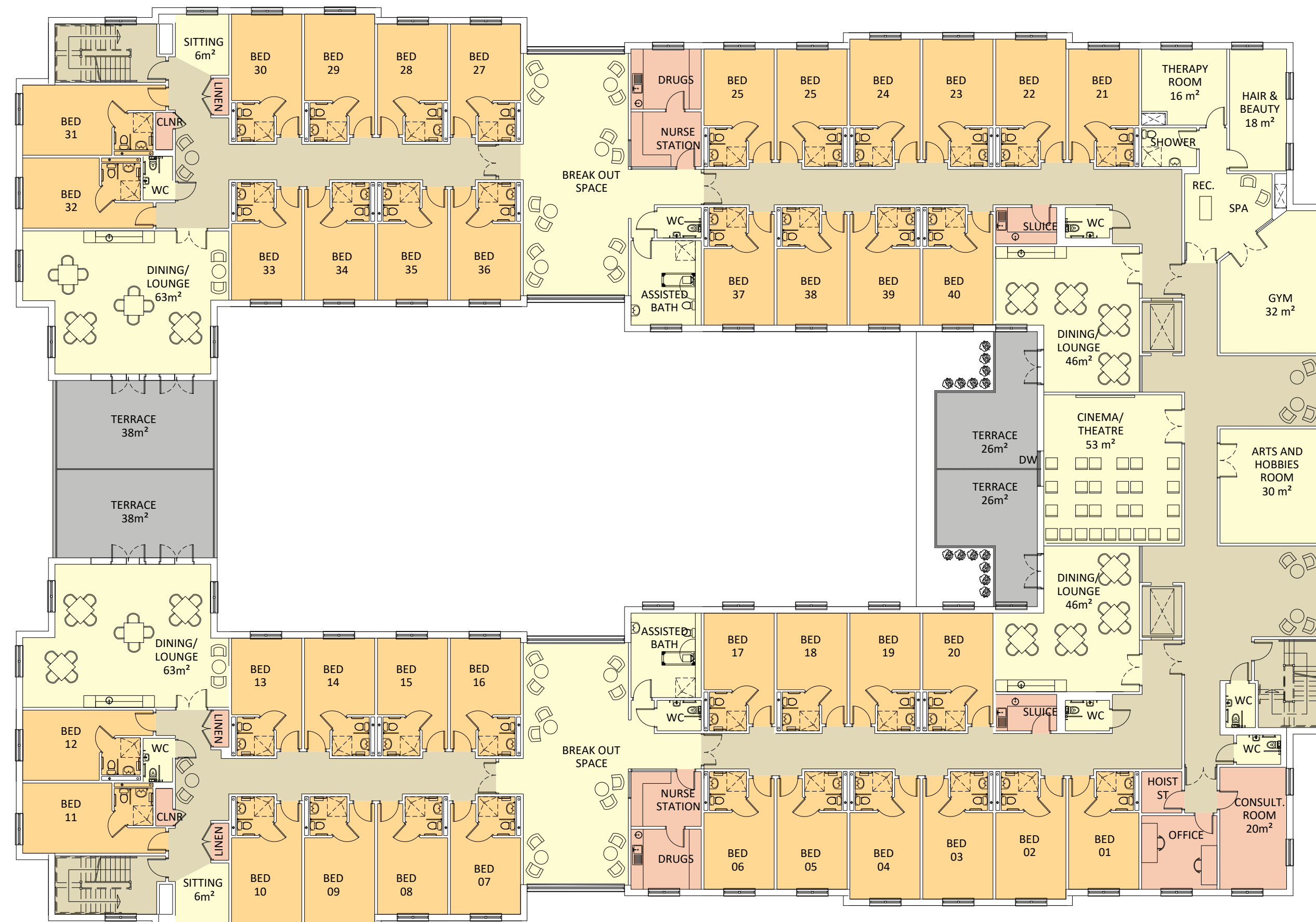
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GROUND FLOOR PLAN  
40 BEDROOMS



FIRST FLOOR PLAN  
40 BEDROOMS

KEY:

- RESIDENT BEDROOM
- COMMUNAL / ACTIVITY SPACE
- STAFF AND SERVICE AREA
- CIRCULATION ROUTES
- EXTERNAL AREAS

Rev.	Description	Author	Checked	Date
P12	ISSUED TO CLIENT FOR COMMENTS	RM	PK	07.10.2020
P11	ISSUED TO CLIENT FOR COMMENTS	IC	PK	02.10.2020
P10	ISSUED TO CLIENT FOR COMMENTS	PK	MM	18.06.2020
P9	SERVICE ROOM COLOUR AMENDED	MM	MM	20.05.2020
P8	LAYOUTS AMENDED IN LINE WITH CLIENT'S COMMENTS	PK	MM	13.05.2020
P7	LAYOUTS AMENDED IN LINE WITH CLIENT'S COMMENTS	PK	MM	12.05.2020
P6	ISSUED TO CLIENT FOR COMMENTS	PK	MM	06.05.2020
P4	ISSUED TO CLIENT FOR COMMENTS	PK	MM	27.04.2020
P3	ISSUED TO CLIENT FOR COMMENTS	PK	MM	23.04.2020
P2	ISSUED TO CLIENT FOR COMMENTS	PK	MM	21.04.2020
P1	ISSUED TO CLIENT FOR COMMENTS	PK	MM	08.04.2020



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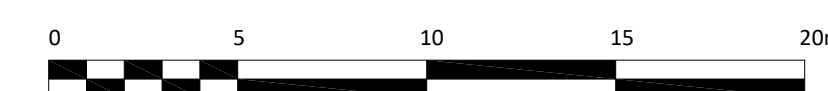
Client: KYN

Project: HOTEL FELIX, CAMBRIDGE

Title: CAPACITY STUDY - FLOOR PLANS  
GROUND AND FIRST FLOOR

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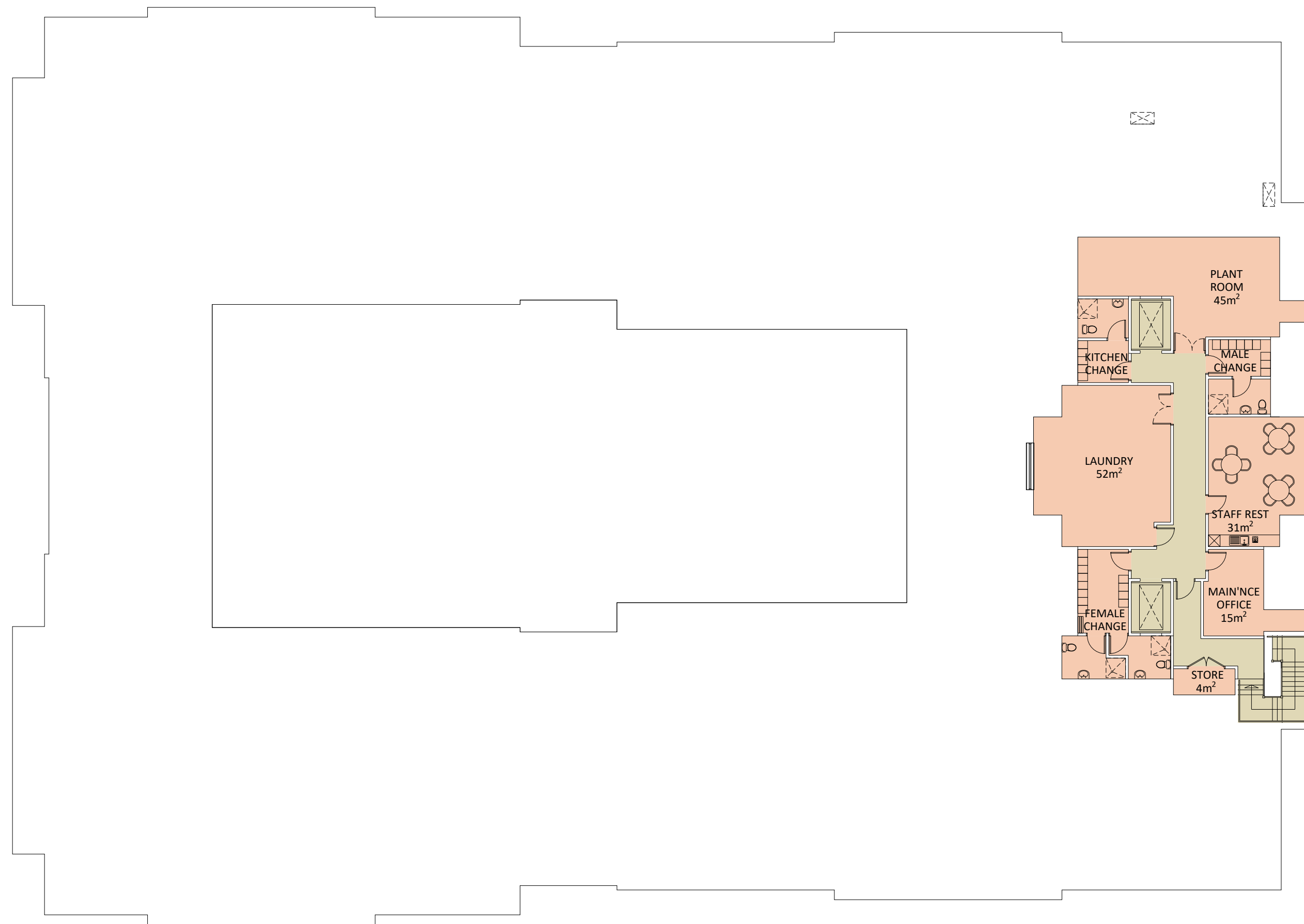
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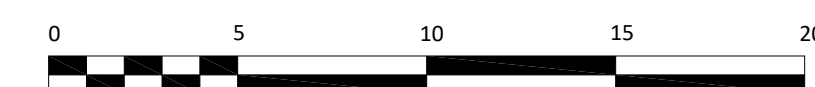
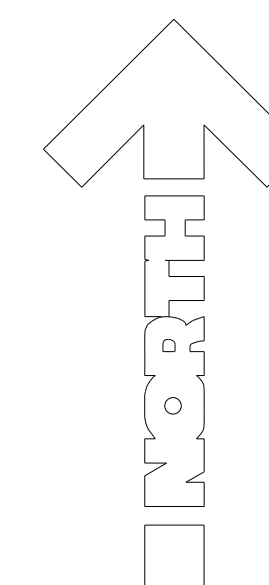
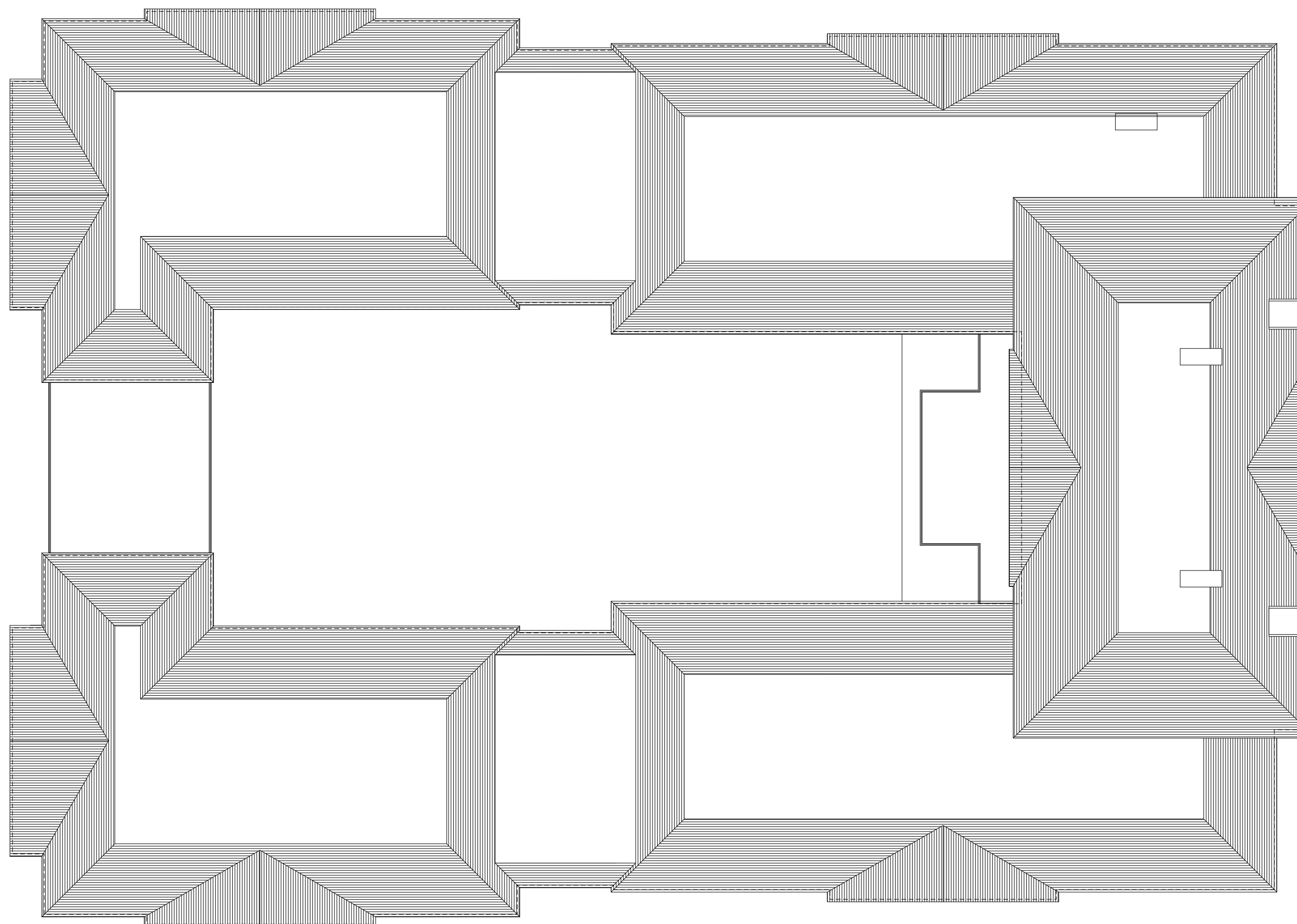
SECOND FLOOR PLAN  
ANCILLARY ACCOMMODATION



KEY:

- RESIDENT BEDROOM
- COMMUNAL / ACTIVITY SPACE
- STAFF AND SERVICE AREA
- CIRCULATION ROUTES
- EXTERNAL AREAS

ROOF PLAN



Rev.	Description	Author	Checked	Date
P9	ISSUED TO CLIENT FOR COMMENTS	RM	PK	07.10.2020
P8	ISSUED TO CLIENT FOR COMMENTS	IC	PK	02.10.2020
P7	ISSUED TO CLIENT FOR COMMENTS	PK	MM	18.06.2020
P6	FLOOR PLAN AMENDED IN LINE WITH CLIENT COMMENTS	PK	NR	26.05.2020
P5	FLOOR DESCRIPTION AMENDED	PK	MM	20.05.2020
P4	ISSUED TO CLIENT FOR COMMENTS	PK	MM	18.05.2020
P3	ISSUED TO CLIENT FOR COMMENTS	PK	MM	13.05.2020
P2	ISSUED TO CLIENT FOR COMMENTS	PK	MM	28.04.2020
P1	ISSUED TO CLIENT FOR COMMENTS	PK	MM	08.04.2020



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A-846

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SIDE ELEVATION

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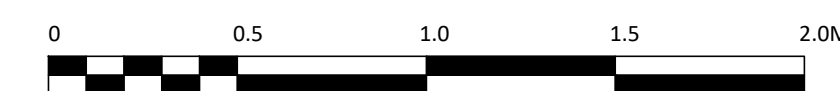
Project  
HOTEL FELIX, CAMBRIDGE

Title  
SKETCH SIDE ELEVATION

C+A no.  
A-846

scale 1:20 author CV chkd PK date Oct. 7, 20 sheet size A1

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846	C+A				A				SK4



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