Philip Acoustics Ltd.

Consultants in Noise and Vibration

REPORT TITLE: NOISE SURVEY AND ASSESSMENT FOR A PROPOSED RESIDENTIAL UNIT ADJACENT TO EXISTING B1 COMMERCIAL USE AT 55 ROCHESTER PLACE & 3A WILMOT PLACE, LONDON NW1 9JU

REPORT REF: 12118-002

ISSUED TO: gpad Ltd
6 Acton Street
London
WC1X 9NG

ISSUED BY: David R Philip BEng (Hons) MIOA

DATE: June 2012

PHILIP ACOUSTICS LTD
107 Bancroft, Hitchin, Hertfordshire, SG5 1NB Tel: 01462 431877 Fax: 01462 431764
e-mail: admin@philipacoustics.co.uk
Member of The Association of Noise Consultants Registered in England No.: 4560265

CONTENTS

SUMMARY

- This report presents results of a noise assessment for a proposed new residential unit at 55 Rochester Place and 3A Wilmot Place, London NW1 9JU. The proposed residential unit is adjacent to and adjoining existing vacant B1 commercial space.

- The assessment covers issues relating to possible noise from the adjacent B1 commercial use potentially affecting the new residential unit; noise from within the B1 commercial use passing through the shared building structure into the residential unit and external noise from deliveries associated with the B1 commercial use.

Noise From Within The B1 Commercial Use Passing Through The Shared Building Structure

- The assessment shows that the separating floor and separating wall between first floor of the proposed residential unit and adjacent B1 commercial use will be required to provide a very high level of sound insulation. Specifications for suitable separating floor and separating wall constructions are provided in the report.

- It is recommended the separating floor construction be formed by a new insulated joist type floor structure constructed independently to, and separate from. the existing concrete ground to first separating floor. It is recommended the separating wall be constructed from triple layer acoustic grade plasterboard each side of independent insulated stud frameworks.

Noise From Deliveries Associated With The B1 Commercial Use

- The assessment shows that noise from deliveries associated with the B1 commercial use might potentially exceed background levels at positions outside the proposed new residential unit. It is therefore recommended that glazing and ventilators of habitable rooms (living room and bedrooms) that are to the side elevation (overlooking Rochester Place) and rear elevation be upgraded to have high sound insulation performance.

1. INTRODUCTION

Philip Acoustics has been commissioned to undertake a noise survey and assessment for a proposed new residential unit at 55 Rochester Place and 3A Wilmot Place, London NW1 9JU. The proposed residential unit is adjacent to and adjoining existing vacant B1 commercial space.

The objective of the noise survey and assessment is to determine possible noise impact of the B1 commercial space to the proposed residential unit and thus enable appropriate noise mitigating measures to be included in the scheme design.

This report presents results of the noise survey and assessment and includes:

- Description of the site and surrounding area;
- Overview of London Borough of Camden Noise Policy;
- Assessment of noise from B1 commercial activity within the adjacent space including specification for noise mitigation measures to the separating floor and wall to the residential unit. This is covered in Section 4 of this report;
- Assessment of noise from deliveries associated with the B1 commercial use including specification for noise mitigation measures. This is covered in Section 5 of this report;

2. SITE DESCRIPTION

The site is on a corner plot at the junction of Rochester Place and Wilmot Place. The area surrounding the site along Rochester Place and Wilmot Place is a mixture of residential and commercial use properties.

The site is over ground and first floor levels and is currently vacant. The site's existing permitted use is B1 commercial.

The proposed residential development is for a self contained 3 bedroom unit over three floors formed by conversion of, and extension above, the front part of the site.

Kitchen / living / dining space for the residential unit will be at first floor level formed by conversion of the existing building and will have a separating floor to the B1 commercial space below and will have a separating wall to the B1 commercial space adjacent. Bedrooms of the residential unit will be over second and third floor levels formed by extension above the existing building. The bedrooms will not have separating floors or walls to the B1 commercial space.

Remainder of the site will be retained as B1 commercial use, i.e. as the currently permitted use. The client has indicated that the B1 space could potentially be occupied by a joiner's workshop, sculptor's studio, furniture restorers and picture framing workshop or similar.

Architect's plan drawings for the proposed development are provided in Appendix A.

3. LONDON BOROUGH OF CAMDEN NOISE POLICY

Policy DP28 - Noise and Vibration of Camden Development Policies 2010-2025 Local Development Framework provides extensive guidance and permitted noise and vibration level thresholds for various development scenarios including for new proposed residential development. Copy of Policy DP28 is included in Appendix B.

In addition, Policy DP28 makes reference to Camden's Noise Strategy document 2002 and also Planning Policy Guidance 24: Planning and Noise (usually referred to as PPG24).

Paragraph 28.3 of Policy DP28 indicates that where uses sensitive to noise (including residential development in this instance) are proposed close to an existing noise source (the existing permitted adjacent B1 commercial use in this instance) then the Council will require an acoustic report and the Council will only grant permission if appropriate attenuation measures are taken.

Therefore, in accordance with the guidance and requirements of Policy DP28, Sections 4 and 5 of this report cover each of the issues relating to possible noise from the adjacent B1 commercial use potentially affecting the proposed new residential unit.

Review of the applicability of guidance and permitted noise level thresholds from Policy DP28 and the other referenced documents is included in each section.

4. NOISE FROM ACTIVITY WITHIN ADJACENT B1 COMMERCIAL SPACE

This covers noise transfer (airborne & flanking) passing through the shared building structure into the residential unit from activity within the adjoining B1 commercial space.

4.1 Noise Criteria

London Borough of Camden's noise policy and other referenced documents do not include any assessment method or noise limit guidance specifically for commercial activity noise potentially affecting adjoining residential occupiers by transfer through a shared building structure.

In addition there is no specific formal British Standard or ISO Standard assessment method or noise limit guidance for commercial activity noise potentially affecting adjoining residential occupiers by transfer through a shared building structure.

However, a general principle that is widely applied in many situations of potential noise disturbance is that of considering whether a noise source would likely be clearly audible or cause a significant increase in the level of existing ambient noise experienced by residential occupiers.

Although whether or not a noise is clearly audible is to a certain extent subjective, depending upon the hearing ability of the resident as well as other factors, it is generally accepted that if a noise is at least 5dB (5 decibels) below the existing background noise, at all frequencies, then the new noise should not generally clearly audible.

For the purpose of acoustic assessment and acoustic design calculations it is proposed to use the noise criteria that B1 commercial activity Leq noise levels for typical busy noisy activity are at least 5dB below the anticipated lowest daytime L90 background noise levels in the residential unit, both in terms of overall dBA and at individual octave band frequencies.

The author has worked on many mixed use commercial and residential projects with noise breakout issues and recommends that at this level, noise transfer from the B1 commercial space to the residential unit via the shared building structure would not be clearly audible or cause noise disturbance to occupants of the new residential unit.

Note that in this instance it is not considered appropriate to assess noise into the residential unit using guidance limits for noise intrusion contained in British Standard BS8233 :1999 " Sound Insulation and Noise Reduction for Buildings – Code of Practice". This is because the guidance limits in British Standard BS8233 are absolute limits (not relative to background noise levels) and are principally intended for consideration of noise intrusion from steady noise sources such as frequent flowing traffic rather than commercial noise sources.

Nor is it considered appropriate to assess noise into the residential use by using sound insulation performance values for separating floors and separating walls to residential properties contained within Building Regulations 2000 (2003 Edition) Approved Document E. This is because the sound insulation performance values within Approved Document E are primarily intended to be applied to floors and walls between residential properties, as opposed to between a commercial and a residential property. Section 0: Performance paragraph 0.8 of Approved Document E covers this and states:

> *"0.8 The performance standards set out in Tables 1a and 1b are appropriate for walls, floors and stairs that separate spaces used for normal domestic purposes. A higher standard of sound insulation may be required between spaces used for domestic purposes and communal or non-domestic purposes. In these situations the appropriate level of sound insulation will depend on the noise generated in the communal or non-domestic space. Specialist advice may be needed to establish if a higher standard of sound insulation is required, and if so, to determine the appropriate level."*

4.2 Noise Survey Details and Procedure

To assess the impact of noise from activity within the adjacent B1 commercial space potentially affecting the new residential unit using the criteria discussed in Section 4.1, the following acoustic tests were carried out:

- Sound insulation of the existing floor construction between the ground floor area and proposed first floor residential unit;
- Noise from typical B1 commercial activity (joiner's workshop or similar activities);
- Background noise levels to inside the proposed residential unit.

Results of the tests allow the level of noise from the B1 commercial space into the residential unit to be predicted and compared with the background noise. Details of survey instrumentation used for the tests are provided in Appendix C.

4.2.1 Sound Insulation of the Existing Separating Floor

To determine the level of sound insulation of the existing concrete separating floor between the ground floor area and proposed first floor of the residential unit above, tests were done by playing a very loud white noise source in the ground floor area whilst measuring the noise inside the ground floor area and also in the first floor above.

The tests determine the "technical" sound insulation performance of the existing structure and include any effect of flanking transmission paths.

The tests were done on 28 May 2012.

The tests are important as the potential benefit of any floor/ceiling acoustic treatments depends greatly upon the "technical" sound insulation performance of the existing structure.

Measurements were recorded generally in accordance with procedures outlined in BS EN ISO 140-4:1998 "*Acoustics – Measurement of sound insulation in buildings and of building elements – Part 4: Field measurements of airborne sound insulation between rooms.*"

Results of the sound insulation tests in terms of Level Difference D dB values are provided in graphical format in Appendix D. Summary of the results are shown in Table 1.

Description	**Octave Band Centre Frequency (Hz)**					
	125	**250**	**500**	**1k**	**2k**	**4k**
Existing ground to first concrete separating floor structure	32	36	40	46	50	54

Table 1: Sound insulation of existing ground to first floor (Level Difference D dB)

Subjectively the dominant path for noise transfer within the existing structure is airborne noise through the floor/ceiling construction. The results are normal for an existing concrete structure floor without as yet any significant acoustic treatment added.

Note that in addition to the separating floor between the ground floor B1 commercial space and first floor residential unit above there is also to be a separating wall between the B1 commercial space and residential unit at first floor level. The separating wall will be a new construction not formed by any existing wall structure; therefore it is not appropriate to undertake sound insulation tests on any existing separating wall structures in this instance.

4.2.2 Noise from B1 Commercial Activity

It is necessary to estimate typical activity noise levels within the B1 commercial space. The B1 commercial use is currently vacant and therefore to provide an indication of likely levels, Philip Acoustics has carried out noise measurements inside a typical woodworking joinery workshop during a typical busy day with various noisy activities taking place. Results of the measurements with noisy activities taking place are summarised in Table 2 on the following page.

Description	Overall dBA	Octave Band Centre Frequency Hz Lin dB 125	250	500	1k	2k	4k
At 1m immediately adjacent to nail gun	92	73	82	86	86	89	80
At 1m immediately adjacent to saw (mitre & cross cut)	90	84	88	87	84	83	81
At 1m immediately adjacent to joint cutter	84	80	82	81	79	76	73
At 1m immediately adjacent to beading moulder	90	87	91	88	83	82	78
At 1m immediately adjacent to router & planeing	89	87	90	87	83	80	80
General Leq (5 min) overall level walking around perimeter woodworking workshop with combinations of all the above equipment items operating (i.e. typical highest noise levels incident on internal ceilings and walls of the workshop)	82	78	81	79	76	76	71

Table 2: Typical internal noise level within B1 commercial space used as woodworking joinery workshop

4.2.3 Background Noise Levels in the Residential Unit

Daytime background noise levels were measured inside the first floor area of the proposed residential unit on 28 May 2012 between approximately 9am and 10am. Noise levels were measured at a central position 1.2m above floor level directly above the B1 commercial space below. Measurements were recorded in terms of L90 overall dBA and linear dB octave band values over 5 minute periods.

Summary of the measured internal background noise level in terms of L90 overall dBA and linear dB octave band values is shown in Table 3. Subjectively the background noise inside the first floor area of the proposed residential unit is low and due to noise from traffic on surrounding streets. The area along Rochester Place and Wilmot Place is relatively quiet with only occasional traffic flow.

Description	Overall dBA	Octave Band Centre Frequency Hz Lin dB 125	250	500	1k	2k	4k
Daytime background noise in area of proposed first floor residential unit L90, (5 min)	27	31	28	25	20	18	14

Table 3: Background noise level inside area of proposed first floor residential unit

4.3 Noise Assessment

Noise from B1 commercial activity is assessed by calculating likely intrusive noise levels inside the residential unit. The calculation is done by subtracting the octave band Level Difference values in Table 1 from the commercial activity internal perimeter noise levels in Table 2 and then comparing the result with the internal background noise levels in Table 3.

Result of the assessment is provided in Table 4.

Description	**Overall dB(A)**	**Octave Band Centre Frequency Hz Lin dB**					
		125	**250**	**500**	**1k**	**2k**	**4k**
(a) Typical high B1 commercial workshop perimeter noise levels Leq, (5 min)	82	78	81	79	76	76	71
(b) Level Difference of existing ground to first separating floor D dB	-	32	36	40	46	50	54
(c) Leq noise level from B1 commercial into residential unit = (a) – (b)	40	46	45	39	30	26	17
(d) Background noise inside residential unit L90, (5 min)	27	31	28	25	20	18	14
(e) Excess of B1 commercial noise above background noise in residential unit = (c) - (d)	13	15	17	14	10	8	3
(f) Improvement needed to sound insulation of floor to ensure B1 commercial noise into residential unit is at least 5dB below the background noise = (e) + 5	-	20	22	19	15	13	8
(g) Overall sound insulation required of the separating floor to ensure B1 commercial noise into residential unit is at least 5dB below the background noise = (b) + (f)	-	52	58	59	61	63	62

Table 4: B1 commercial activity noise into the residential unit and improvement required to sound insulation of floor (Level Difference D dB)

Recommendations for mitigating measures to improve the separating floor sound insulation to achieve the required improvement are provided in Section 4.4.

4.4 Mitigating Measures

4.4.1 Layout Of Residential Unit

The proposed layout for the residential unit puts the kitchen / living / dining area at first floor level, which is directly above and adjacent to the B1 commercial space. Bedrooms are to upper floor levels and do not have separating floors or walls to the B1 commercial space.

This layout of rooms is beneficial in terms of noise mitigation with the kitchen / living / dining area acting as a buffer zone to the residential bedrooms to protect against possible B1 commercial noise that might potentially occur at times when occupants of the residential unit are sleeping.

4.4.2 Layout Within B1 Commercial Space

Whilst the noise assessment described in Section 4.3 cautiously assumes a worse case scenario of typical noisy B1 commercial activity immediately below and adjacent to the residential unit, given the layout of the B1 space it is likely that the area under the proposed residential unit would be used as office space with noise emitting operations located more to the middle and rear of the commercial space so to not be immediately adjacent to the residential unit.

4.4.3 Separating Floor

The client has advised the existing separating floor is to remain and can only be upgraded in terms of sound insulation by applying treatment to above the existing floor structure.

Based on considerable acoustic design and testing experience of Philip Acoustics for separating floor constructions, it is recommended that the required very high level of sound insulation for the separating floor identified in Table 4 be achieved by the construction of a new and separate (isolated) floor structure for the residential unit that is above and separate from the existing floor. Sufficient sound insulation would not be achieved by use of proprietary acoustic flooring simply laid over the existing floor structure.

Specification details for the treatment are provided below. It is essential that any gaps or holes where the existing floor structure or ceiling is missing be repaired / made good in advance of the upgrade works.

It is recommended the new and separate floor structure can be formed using timber joists (traditional timber joists, timber I joists or metal web joists) positioned above the existing floor (not touching the floor) with as large a void depth as possible, minimum 100mm between the top of the existing floor and underside of the new joists. The bigger the void depth, the better the sound insulation performance achieved.

The new joist floor structure can be supported from the perimeter walls of the building (subject to structural consideration by others) or be supported off up-stands or pad-stones set up from the existing floor.

The new joist floor structure would include proprietary acoustic flooring system on top of minimum 18mm tongue & groove flooring boards on top of the joists and would include double layer of 2 x minimum 15mm SoundBloc (or equivalent) either under or to the bottom of the joists.

Typical acoustic flooring systems for installation on top of minimum 18mm tongue & groove flooring boards on top of the joists include the following:

- Deckfon Chip 26T by Cellecta
- Deck18 by Monarfloor

The formed voids underneath the new floor and between the joists of the new floor to each be filled with minimum 100mm mineral wool insulation (minimum density 20kg/m^3).

A concept sketch drawing showing the existing separating floor with additional floor structure above is included in Appendix E.

4.4.4 Separating Wall

The sound insulation performance requirement for the new separating wall between the B1 commercial use and residential unit at first floor is same as for the separating floor item (g) in Table 4.

This very high sound insulation performance would be best achieved by constructing a wall using multi layers of plasterboard on a twin independent and insulated stud frameworks.

Typical specification for a suitable wall would be 3 x layers 15mm SoundBloc each side independent timber or metal studwork with 2 x 100mm mineral wool insulation (minimum density 20kg/m^3) in the void (i.e. 1 x 100mm insulation within each stud framework), the wall to have overall width minimum 450mm. Note the width of the wall is very important, the wider the wall the higher the sound insulation.

British Gypsum provide wall systems to this form of specification called GypWall Audio. The walls are often used in scenarios requiring a very high level of insulation such as between recording studios and between multi screen cinema auditoria etc, however they are also often used to separate very noisy areas from residential parts of the same building, for example where a building might have a bar with music or busy restaurant at first floor adjacent to a residential unit.

A concept sketch drawing showing this form of separating wall is included in Appendix E.

5. NOISE FROM DELIVERIES

This covers possible external noise to the new residential unit from deliveries associated with the B1 commercial use.

5.1 Noise Criteria

Policy 17 of Camden's Noise Strategy document 2002, referenced by Policy DP28, provides guidance on noise from deliveries and collections. Policy 17 states:

> *"Policy 17: The Council recognises the problems faced with making deliveries and collections in London. We will continue to protect residential environments from noise caused by night time deliveries and collections but will take a flexible approach to demands for deliveries and collections outside normal hours and in particular will look favourably on proposals to use EEVs and integrated quiet delivery systems in both new and existing developments."*

However, London Borough of Camden's noise policy and other referenced documents do not include any assessment method or noise limit guidance specifically for delivery noise potentially affecting nearby residential occupiers.

In addition there is no specific formal British Standard or ISO Standard assessment method or noise limit guidance for delivery noise potentially affecting residential occupiers.

Notwithstanding this, PPG24 advises that where there is likelihood of complaints from residents about external noise from industrial and commercial developments then assessment using guidance in British Standard BS4142:1997 "Method for rating industrial noise affecting mixed residential and industrial areas" is appropriate.

Section 1 of BS4142 describes the scope of the standard as being suitable for assessing sources of noise of an industrial nature affecting residents. It is considered that although deliveries cannot be strictly described as of industrial nature in terms of activity, the actual type of noise generated could be described as similar to that which potentially occurs at industrial sites. Therefore it is considered BS4142 is applicable to this scenario to provide suitable criteria for assessing noise from deliveries associated with the B1 commercial use.

The BS4142 assessment method requires that source noise data for deliveries is determined. Details of how the source noise data has been determined for use in the assessments are provided in Section 5.2. The assessment method also requires that existing external background noise levels be measured; details of the noise survey carried to determine existing external background noise levels adjacent to the proposed new residential unit are provided in Section 5.3.

5.2 Source Noise Levels

The B1 commercial use is currently vacant so it is not possible to determine any delivery source noise data at the site by direct measurement. Philip Acoustics has therefore measured typical noise from deliveries to several other small commercial sites. Measured delivery source noise levels and descriptions are provided below.

Deliveries to similar sized commercial sites are typically by Transit / Luton Box type vans and pick ups as well as by smaller Transit Connect type vans. It is not anticipated the B1 commercial use at this location would have deliveries by larger vehicles.

Delivery duration is approximately up to 15 minutes usually by hand although some similar sized businesses also use manual hydraulic pump action pallet trucks and manual load carrying trolleys. Neither of these has any noise generating engines or motors and generate any noise by wheels moving along the floor.

Measurements and comments for each type of noise source occurring during a typical delivery are provided in Table 5. Measurements were carried out at a distance of 3m from the source activity (a distance of 1m not being practicable or safe). Note that the noise levels in Table 5 are the typical highest noise levels measured from each activity associated with a delivery and are therefore considered cautious for use in the noise calculations and assessments in Section 5.3.

Activity Description	**Sound Pressure Level at 3m Leq (1 min)**	**Comments**
Transit type van drives up and stops, driver turns of engine off, gets out and shuts door	60dBA	Noise includes engine, manoeuvring and door shutting
Unloading / Loading boxes manually from van by hand using hydraulic pallet truck	65dBA	Noise from hard plastic wheels of trolley on concrete is dominant
Unloading / Loading boxes manually from van by hand using trolley	53dBA	Quieter than hydraulic pallet truck

Table 5: Summary delivery noise levels

5.3 Survey Of Existing External Background Noise Levels

The site is secure and therefore a sound level meter was left over several days, including a weekend to obtain representative samples of existing external background noise at all times of day and night.

The measurement location was selected to just outside the Rochester Place façade of the building at first floor level to provide representative existing background noise levels external to the proposed new residential unit nearest to the likely position for deliveries to the B1 commercial use. This measurement location was also selected as being quieter than the Wilmot Place façade (noise levels to outside the Wilmot Place façade are slightly higher than along the Rochester Place facade due to slightly more traffic flow along Wilmot Place and also being less screened from the nearby A5202 St Pancras Way. The measurement location was achieved using a telescopic extension pole and microphone extension cable arrangement.

The background noise survey was carried out over the seven day period 22 May 2012 to 28 May 2012. The weather included dry and clam periods during the day and also night time periods.

The Rion NL-31 logging sound level meter was set up to record background noise levels over 60 minute periods (split into 12 x 5 minute periods to enable more accurate analysis of results as required). Measurements of background noise were recorded as overall LA90 dB values.

Results of the noise survey over the seven day period are provided in graphical format in Appendix F.

It is expected that deliveries associated with the B1 commercial use would normally occur between typically 8am to 6pm, however the client has indicated there may be need for “out of hours” deliveries that might possibly occur 6am to 10pm. Therefore in undertaking assessment of possible noise from deliveries to the new residential unit it is cautiously taken that deliveries might occur 6am to 10pm and correspondingly the lowest measured external background noise in the range 6am to 10pm is used for the assessment.

The lowest external background noise level recorded during the periods 6am to 10pm is shown in Table 6.

Description	**L90 (5 minutes)**
Lowest recorded background level in range 6am to 10pm	38dBA

Table 6: Lowest external background noise level 6am to 10pm

5.4 Calculation And Assessment Of Noise From Deliveries

Using the measured source noise levels described in Section 5.2 spreadsheet calculations have been done to establish the magnitude of noise associated with deliveries, transmitting to outside nearest windows of the new residential unit.

Details of the calculations are provided in Appendix G. Using results of the calculations a BS4142 assessment of noise associated with deliveries has then been carried out. Full details of the BS4142 noise assessment are also provided in Appendix G.

The assessment shows that the Rating Level of noise from deliveries to outside the new residential unit is potentially greater than 5dBA above the background noise and therefore BS4142 advises there is possibility of noise complaints.

It is therefore appropriate to specify noise mitigating measures to protect occupiers of the new residential unit from possible delivery noise associated with the B1 commercial use. Recommendations for mitigating measures are provided in Section 5.5.

5.5 Mitigating Measures

Noise from deliveries will potentially affect occupiers of the new residential unit via glazing and any ventilators of the external building envelope of the residential unit. Therefore it is recommended these be designed and specified to provide sufficient sound insulation against external delivery noise. External walls of the new residential unit will readily reduce external delivery noise and do not require special consideration.

5.5.1 Glazing

Glazing to habitable rooms (living rooms and bedrooms) of the new residential unit along the side elevation (facing Rochester Place) and to the rear elevation is required to be upgraded to provide a high level of sound insulation.

Values in Table 7 show a specification schedule of glazing sound insulation performance for different parts of the residential unit.

Description	**Octave Band Centre Frequency (Hz)**						**Comments**
	125	**250**	**500**	**1k**	**2k**	**4k**	
Glazing to habitable rooms (living room & bedrooms) within side elevation and rear facade	26	34	44	56	53	52	High performance secondary acoustic glazing system minimum Rw 44dB
Glazing to other parts	*No special acoustic performance requirement*						Standard double glazing such as good quality 4/16/4 double glazing (provides typically minimum Rw 32dB)

Table 7: Specification for glazing sound insulation performance Sound Reduction Index R dB

The sound insulation performance figures for habitable rooms (living rooms and bedrooms) of the new residential unit along the side elevation (facing Rochester Place) and to the rear elevation correspond to a high performance acoustic glazing system normally achievable only using secondary acoustic glazing.

A suitable secondary glazing system to provide minimum Rw 44dB would typically comprise a minimum 6mm single thickness laminated or toughened glass pane inside of a normal double glazing outer window such as configuration 4/16/4 (4mm glass – 16mm air gap – 4mm glass).

The size of the airgap between the outer window and the inner secondary glazing is important, the bigger the gap the better the performance. It is recommended that the gap between the outer window and the inner secondary glazing must be at least 100mm.

However, there are many permutations of possible configurations and different glazing suppliers will tend to use their own preferred configurations. Providing that the overall performance is minimum Rw 44dB and the individual octave band performance is not less than those in Table 7 then any alternative glazing configuration can be used.

The windows frames will need to have effective acoustic seals all round. Effective seals are rubber or neoprene beaded "P" type that compresses all around on closure of the windows. Plastic type or brush type weathering seals are not classed as effective acoustic seals.

5.5.2 Ventilators

It is anticipated that rooms of the new residential unit may have ventilators (as opposed to mechanical ventilation system) such that residential occupiers are able to have ventilation without necessarily needing to open windows.

If ventilators are used (as opposed to mechanical ventilation system), then any ventilators that are to habitable rooms (living rooms and bedrooms) of the new residential unit located along the side elevation (facing Rochester Place) and to the rear elevation are required to be upgraded to provide a high level of sound insulation.

Values in Table 8 show a specification for ventilator sound insulation performance for different parts of the residential unit.

Description	**Octave Band Centre Frequency (Hz)**						**Comments**
	125	**250**	**500**	**1k**	**2k**	**4k**	
Ventilators to habitable rooms (living room & bedrooms) within side elevation and rear facade	33	39	45	47	54	50	Very high performance proprietary acoustic ventilator >$D_{n,e,w}$ 45dB
Ventilators to other parts	*No special acoustic performance requirement*						Standard passive ventilators are satisfactory

Table 8: Acoustic ventilator specification, Normalised Level Difference Dn,e dB

This is a very high ventilator acoustic performance with only a few specialised ventilator suppliers able to provide an appropriate product. Details of two possible ventilators are provided below:

- Renson: Sonovent or Invisivent AK49 ($D_{n,e,w}$ 49dB ventilator)
- Caice Acoustic Air Movement Ltd: Acoustic ventilator ($D_{n,e,w}$ 50dB ventilator)

Note that for secondary glazing systems then if a “wall type” ventilator is not used then the high performance acoustic ventilator would normally go within the outer glazing frame and normally a plain slot type (non-acoustic) ventilator would go within the inner secondary glazing frame.

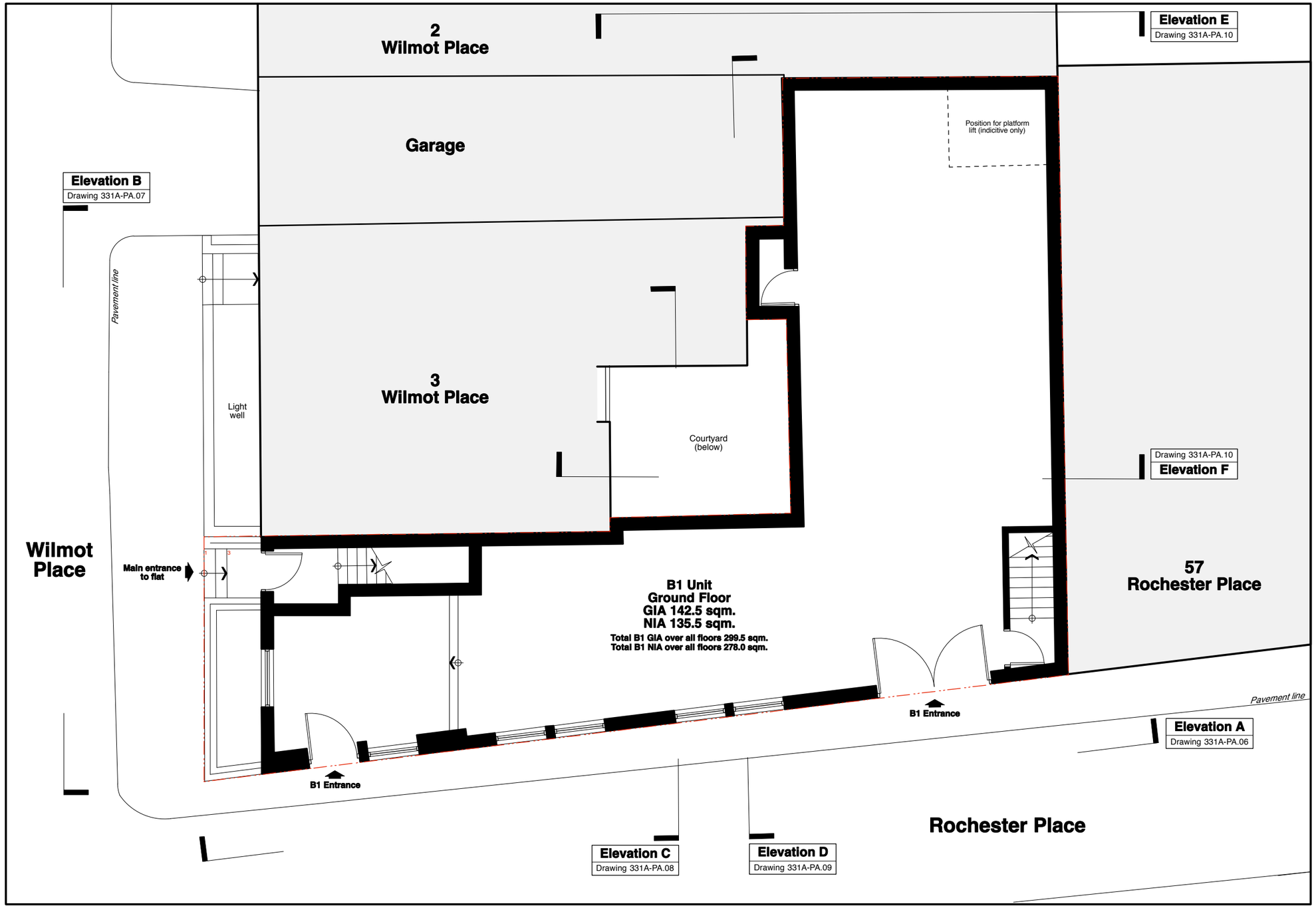
5.5.3 Good Practice / Noise Management For Deliveries

In addition to the specified noise mitigation for glazing and ventilators described in Sections 5.5.1 and 5.5.2, it would be appropriate for the B1 Commercial use to apply good practice and a noise management plan for deliveries. This would typically seek to include some or all of the items listed on the following page:

- When possible, undertake deliveries directly to or from inside the building, by the delivery vehicle parking inside or immediately adjacent to the delivery door;
- Delivery vehicle engines not to be kept running;
- Trolleys and pallet trucks to have rubber wheels (as opposed to hard plastic wheels);
- Trolleys and pallet trucks to be routinely maintained/serviced and any pot holes or similar in the delivery area to be repaired;
- No music (radios etc) to be played anywhere externally at the site.

APPENDIX A

Drawings Of The Proposed Development



PROPOSED:
GRD FLOOR PLAN

0 5m

N

PRELIMINARY

This layout is preliminary and for development use only and will require approval of local authorities and building control.

All dimensions approximate based on preliminary survey and photographs and subject to measured site survey after strip out.

All proposed structural and mechnical alterations to any of the existing are subject to structural engineer and M&E drawings.

rev.	date	notes

This drawing is the copyright of **gpad ltd**. Figured dimensions to be taken in preference to those scaled. All dimensions to be checked on site before any work proceeds. Drawing not to be used for land transfer purposes. Drawings to be read in conjunction with relevant drawings and specification. Not to be reproduced, retained or disclosed to any unauthorised person either wholly or in part without written permission.

© gpad ltd.

PROJECT
55 ROCHESTER PLACE &
3A WILMOT PLACE
LONDON NW1 9JU

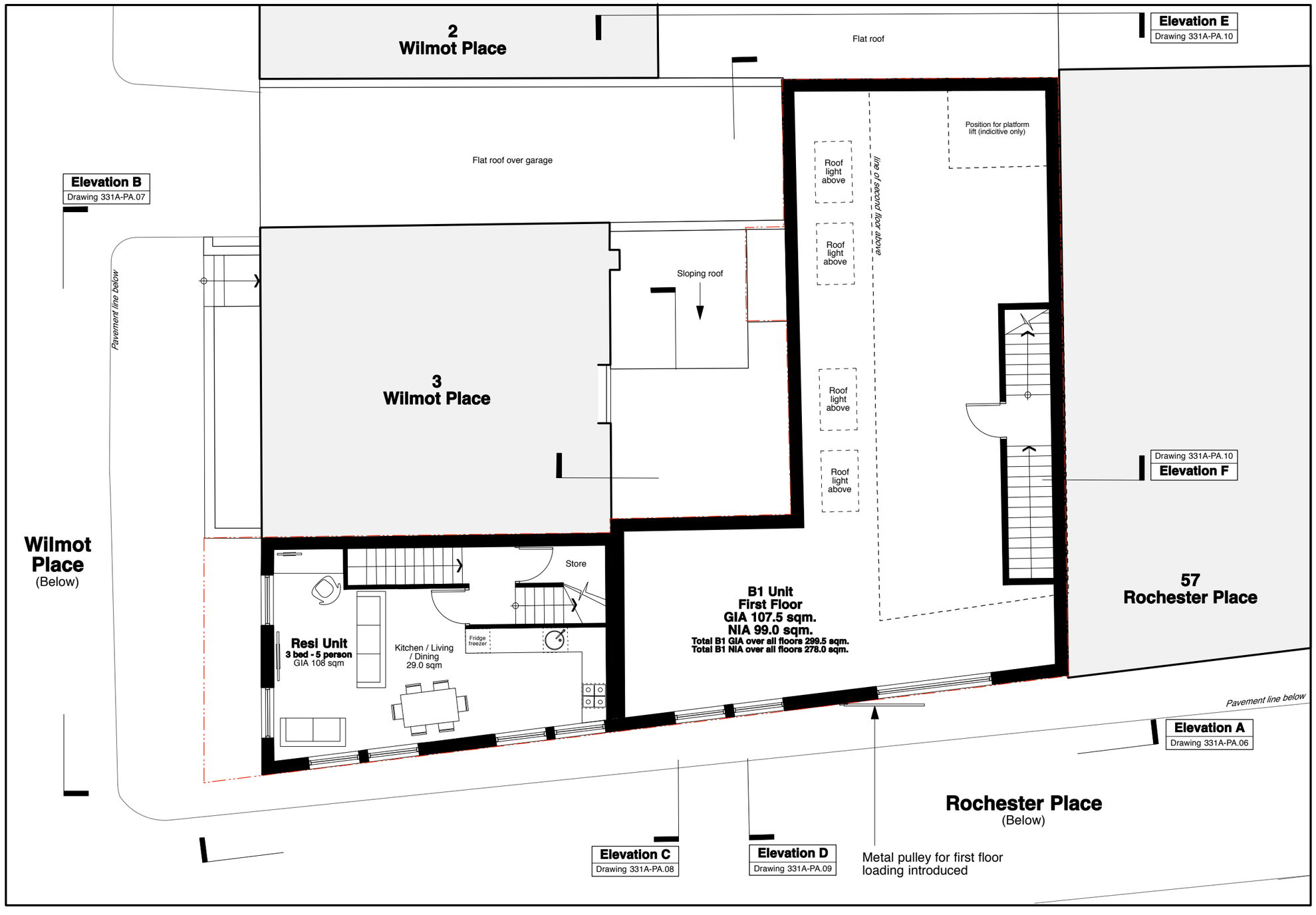
CLIENT

SCALE	DATE	DWG BY	REV.
1:100 @ A3	APR 12	CB	

CHCKD.	DWG NO.
	331A-PA.01

DRAWING TITLE
PROPOSED:
GRD FLOOR PLAN

general practice architects & designers
gpad ltd. 6 acton st, london. wc1x 9na
t: 020 7833 0222 f: 020 7833 2220
e - mail: info@gpadltd.com
web: www.gpadltd.com



PROPOSED: FIRST FLOOR PLAN

0 5m

N

PRELIMINARY

This layout is preliminary and for development use only and will require approval of local authorities and building control.

All dimensions approximate based on preliminary survey and photographs and subject to measured site survey after strip out.

All proposed structural and mechnical alterations to any of the existing are subject to structural engineer and M&E drawings.

rev.	date	notes

This drawing is the copyright of **gpad ltd**. Figured dimensions to be taken in preference to those scaled. All dimensions to be checked on site before any work proceeds. Drawing not to be used for land transfer purposes. Drawings to be read in conjunction with relevant drawings and specification. Not to be reproduced, retained or disclosed to any unauthorised person either wholly or in part without written permission.

© gpad ltd.

PROJECT
55 ROCHESTER PLACE &
3A WILMOT PLACE
LONDON NW1 9JU

CLIENT

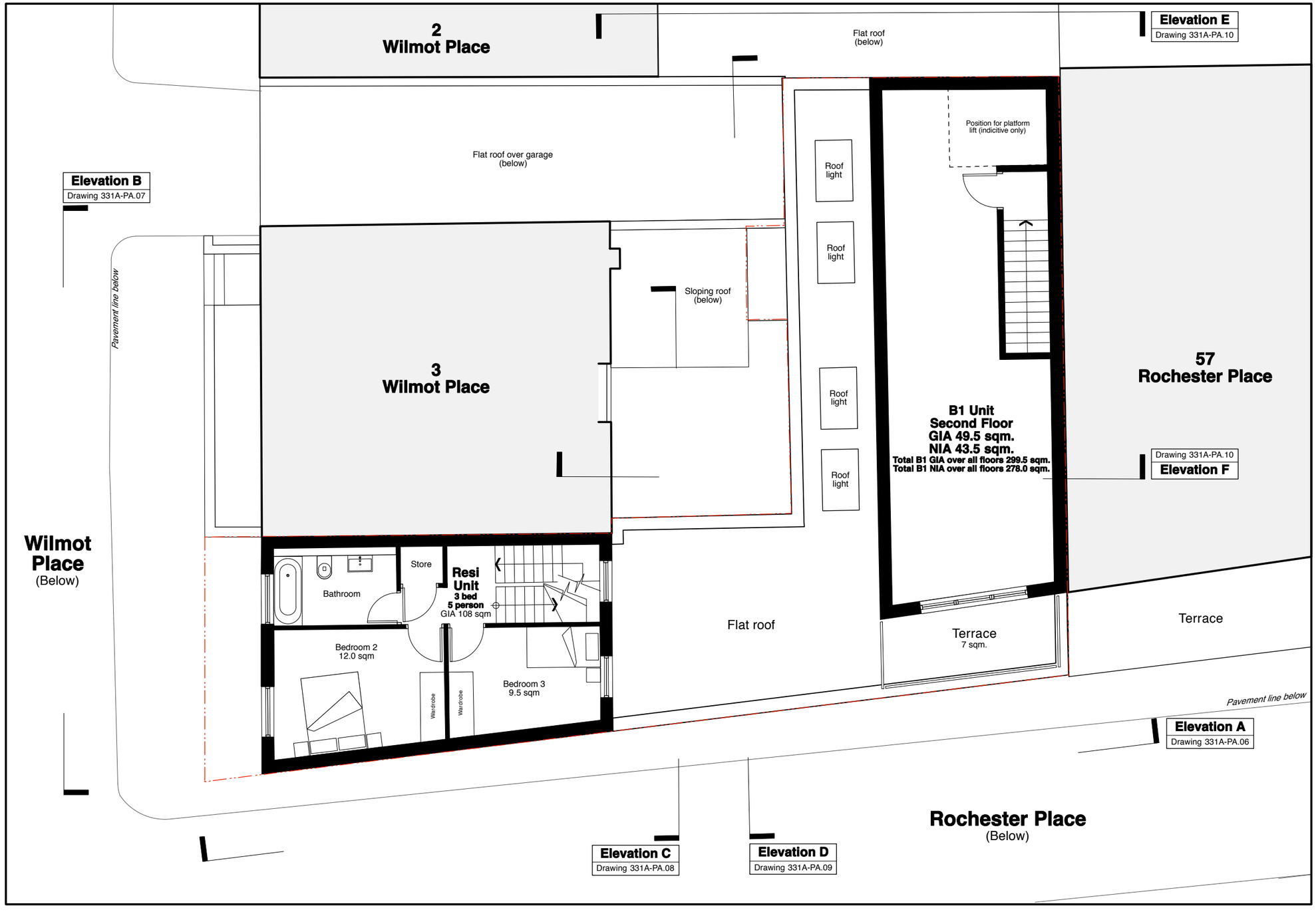
DRAWING TITLE
PROPOSED:
1ST FLOOR PLAN

SCALE	DATE	DWG BY	REV.
1:100 @ A3	APR 12	CB	

CHCKD.

DWG NO. **331A-PA.02**

gpad
general practice architects & designers
gpad ltd. 6 acton st, london. wc1x 9na
t: 020 7833 0222 f: 020 7833 2220
e - mail: info@gpadltd.com
web: www.gpadltd.com



PROPOSED:
SECOND FLOOR PLAN

0 5m

N

PRELIMINARY

This layout is preliminary and for development use only and will require approval of local authorities and building control.

All dimensions approximate based on preliminary survey and photographs and subject to measured site survey after strip out.

All proposed structural and mechnical alterations to any of the existing are subject to structural engineer and M&E drawings.

rev.	date	notes

This drawing is the copyright of **gpad ltd**. Figured dimensions to be taken in preference to those scaled. All dimensions to be checked on site before any work proceeds. Drawing not to be used for land transfer purposes. Drawings to be read in conjunction with relevant drawings and specification. Not to be reproduced, retained or disclosed to any unauthorised person either wholly or in part without written permission.
© gpad ltd.

PROJECT
55 ROCHESTER PLACE &
3A WILMOT PLACE
LONDON NW1 9JU

CLIENT

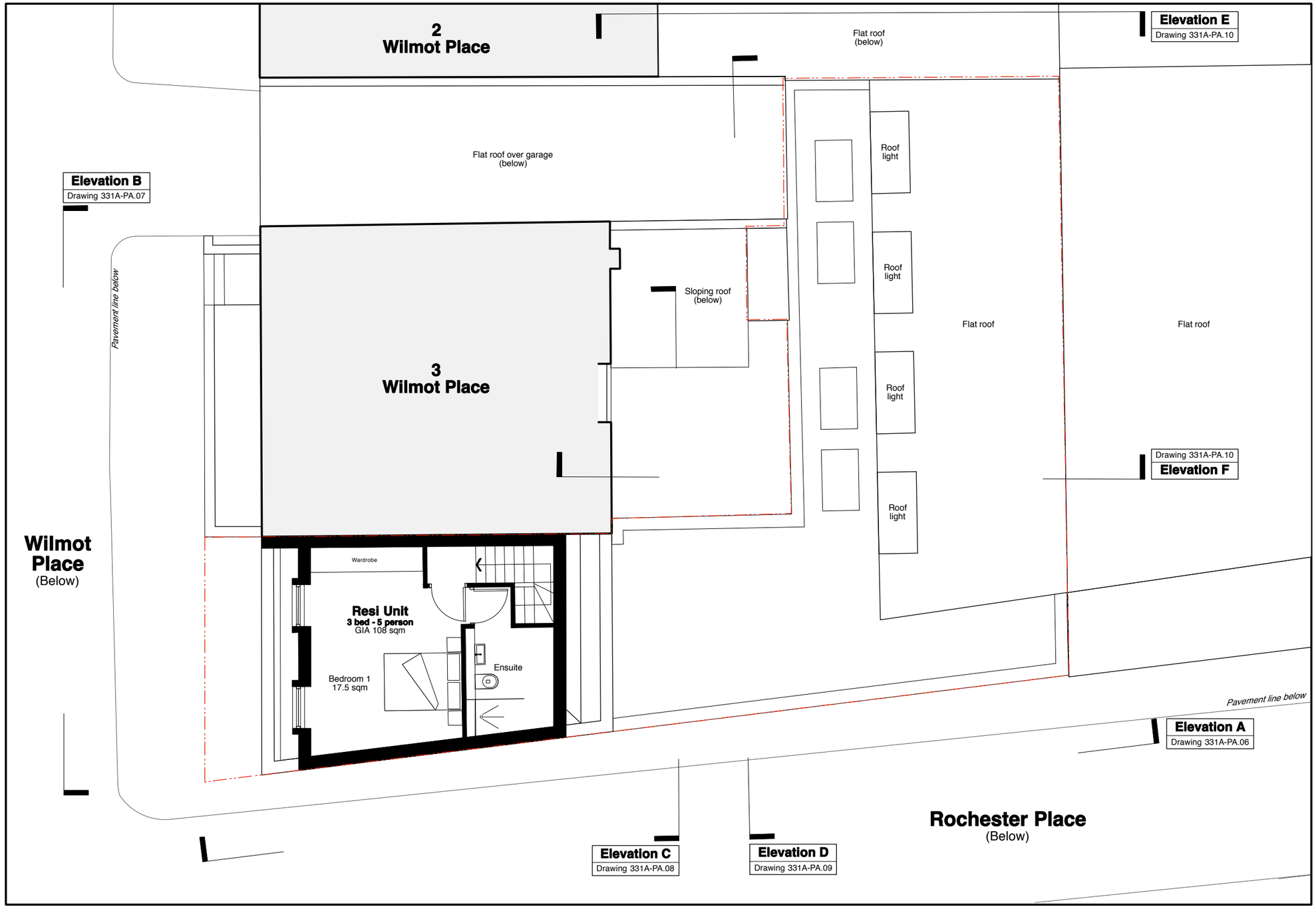
SCALE	DATE	DWG BY	REV.
1:100 @ A3	**APR 12**	**CB**	

CHCKD.

DWG NO. **331A-PA.03**

DRAWING TITLE
PROPOSED:
2ND FLOOR PLAN

gpad
general practice architects & designers
gpad ltd. 6 acton st, london. wc1x 9na
t: 020 7833 0222 f: 020 7833 2220
e - mail: info@gpadltd.com
web: www.gpadltd.com



PROPOSED:
THIRD FLOOR PLAN

0 5m

N

PRELIMINARY

This layout is preliminary and for development use only and will require approval of local authorities and building control.

All dimensions approximate based on preliminary survey and photographs and subject to measured site survey after strip out.

All proposed structural and mechnical alterations to any of the existing are subject to structural engineer and M&E drawings.

rev.	date	notes

This drawing is the copyright of **gpad ltd**. Figured dimensions to be taken in preference to those scaled. All dimensions to be checked on site before any work proceeds. Drawing not to be used for land transfer purposes. Drawings to be read in conjunction with relevant drawings and specification. Not to be reproduced, retained or disclosed to any unauthorised person either wholly or in part without written permission.

© gpad ltd.

PROJECT
**55 ROCHESTER PLACE &
3A WILMOT PLACE
LONDON NW1 9JU**

CLIENT

SCALE	DATE	DWG BY	REV.
1:100 @ A3	**APR 12**	**CB**	

CHCKD.

DWG NO. **331A-PA.04**

DRAWING TITLE
**PROPOSED:
3RD FLOOR PLAN**

gpad
general practice architects & designers
gpad ltd. 6 acton st, london. wc1x 9na
t: 020 7833 0222 f: 020 7833 2220
e - mail: info@gpadltd.com
web: www.gpadltd.com

APPENDIX B

London Borough of Camden Policy DP28 Noise And Vibration

DP28. Noise and vibration

28.1 Noise and vibration can have a major effect on amenity and health and therefore quality of life. Camden's high density and mixed-use nature means that disturbance from noise and vibration is a particularly important issue in the borough. Camden's Core Strategy recognises the importance of this issue for Camden's residents and policy DP28 contributes to implementing a number of Core Strategy policies, including CS5 – *Managing the impact of growth and development*, CS9 – *Achieving a successful Central London*, CS11 – *Promoting sustainable and efficient travel* and CS16 – *Improving Camden's health and well-being.*

DP POLICY

DP28 – Noise and vibration

The Council will seek to ensure that noise and vibration is controlled and managed and will not grant planning permission for:

a) development likely to generate noise pollution; or

b) development sensitive to noise in locations with noise pollution, unless appropriate attenuation measures are provided.

Development that exceeds Camden's Noise and Vibration Thresholds will not be permitted.

The Council will only grant permission for plant or machinery if it can be operated without cause harm to amenity and does not exceed our noise thresholds.

The Council will seek to minimise the impact on local amenity from the demolition and construction phases of development. Where these phases are likely to cause harm, conditions and planning obligations may be used to minimise the impact.

28.2 The effect of noise and vibration can be minimised by separating uses sensitive to noise from development that generates noise and by taking measures to reduce any impact. Noise sensitive development includes housing, schools and hospitals as well as offices, workshops and open spaces, while noise is generated by rail, road and air traffic, industry, entertainment (e.g. nightclubs, restaurants and bars) and other uses.

28.3 The Council will only grant planning permission for development sensitive to noise in locations that experience noise pollution, and for development likely to generate noise pollution, if appropriate attenuation measures are taken, such as double-glazing. Planning permission will not be granted for development sensitive to noise in locations that have unacceptable levels of noise. Where uses sensitive to noise are proposed close to an existing source of noise or when development that generates noise is proposed, the Council will require an acoustic report to ensure compliance with PPG24: *Planning and noise*. A condition will be imposed to require that the plant and equipment which may be a source of noise pollution is kept working efficiently and within the required noise limits and time restrictions. Conditions may also be imposed to ensure that attenuation measures are kept in place and effective throughout the life of the development.

28.4 In assessing applications, we will have regard to the Noise and Vibration Thresholds, set out below. These represent an interpretation of the standards in PPG24 and include an evening period in addition to the day and night standards contained in the PPG, which provide a greater degree of control over noise and vibration during a period when noise is often an issue in the borough.

Table A: Noise levels on residential sites adjoining railways and roads at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Sites adjoining railways	Sites adjoining roads
Noise at 1 metre external to a sensitive façade	Day	0700-1900	74 dB L_{Aeq},12h	72 dB L_{Aeq},12h
Noise at 1 metre external to a sensitive façade	Evening	1900-2300	74 dB L_{Aeq},4h	72 dB L_{Aeq},4h
Noise at 1 metre external to a sensitive façade	Night	2300-0700	66 dB L_{Aeq},8h	66 dB L_{Aeq},8h

Table B: Noise levels on residential streets adjoining railways and roads at and above which attenuation measures will be required

Noise description and location of measurement	Period	Time	Sites adjoining railways	Sites adjoining roads
Noise at 1 metre external to a sensitive façade	Day	0700-1900	65 dB L_{Aeq},12h	62 dB L_{Aeq},12h
Noise at 1 metre external to a sensitive façade	Evening	1900-2300	60 dB L_{Aeq},4h	57 dB L_{Aeq},4h
Noise at 1 metre external to a sensitive façade	Night	2300-0700	55 dB L_{Aeq},1h	52 dB L_{Aeq},1h
Individual noise events several times an hour	Night	2300-0700	>82 dB L_{Amax} (S time weighting)	>82 dB L_{AMAX} (S time weighting)

Table C: Vibration levels on residential sites adjoining railways and roads at which planning permission will not be granted

Vibration description and location of measurement	Period	Time	Vibration levels
Vibration inside critical areas such as a hospital operating theatre	Day, evening and night	0000-2400	0.1 VDV ms-1.75
Vibration inside dwellings	Day and evening	0700-2300	0.2 to 0.4 VDV ms-1.75
Vibration inside dwellings	Night	2300-0700	0.13 VDV ms-1.75
Vibration inside offices	Day, evening and night	0000-2400	0.4 VDV ms-1.75
Vibration inside workshops	Day, evening and night	0000-2400	0.8 VDV ms-1.75

Where dwellings may be affected by ground-borne regenerated noise internally from, for example, railways or underground trains within tunnels, noise levels within the rooms should not be greater than 35dB(A)max

Table D: Noise levels from places of entertainment on adjoining residential sites at which planning permission will not be granted

Noise description and measurement location	Period	Time	Sites adjoining places of entertainment
Noise at 1 metre external to a sensitive façade	Day and evening	0700-2300	L_{Aeq}, 5m shall not increase by more than 5dB*
Noise at 1 metre external to a sensitive façade	Night	2300-0700	L_{Aeq}, 5m shall not increase by more than 3dB*
Noise inside any living room of any noise sensitive premises, with the windows open or closed	Night	2300-0700	L_{Aeq}, 5m (in the 63Hz Octave band measured using the 'fast' time constant) should show no increase in dB*

* As compared to the same measure, from the same position, and over a comparable period, with no entertainment taking place

Table E: Noise levels from plant and machinery at which planning permission will not be granted

Noise description and location of measurement	Period	Time	Noise level
Noise at 1 metre external to a sensitive façade	Day, evening and night	0000-2400	5dB(A) <LA90
Noise that has a distinguishable discrete continuous note (whine, hiss, screech, hum) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise that has distinct impulses (bangs, clicks, clatters, thumps) at 1 metre external to a sensitive façade.	Day, evening and night	0000-2400	10dB(A) <LA90
Noise at 1 metre external to sensitive façade where LA90>60dB	Day, evening and night	0000-2400	55dBL_{Aeq},

Key evidence and references

- Camden's Noise Strategy, 2002
- The London Plan (Consolidated with Alterations since 2004), 2008
- Planning Policy Guidance 24: Planning and noise

APPENDIX C

Noise Survey Instrumentation

Site: 55 Rochester Place & 3A Wilmot Place, London NW1 9JU

Ref: 12118-002 Appendix C

Date: June 2012

NOISE SURVEY INSTRUMENTATION

Seven Day Background Noise Survey:

- Rion sound level meter type NL-31 Class 1 serial number 00431030 plus Rion microphone type UC-53A serial number 00315091 complete with weatherproof and lockable outdoor environmental kit, microphone extension lead and extension boom arrangement;
- Bruel & Kjaer calibrator type 4231 serial number 2642929 (UKAS certified).

Noise Surveys Of Comparable Size Woodworking Workshop (Internal Activity & Deliveries) and Daytime Background At First Floor Level Of Site:

- Bruel & Kjaer sound level meter type 2260 serial number 2627604 plus Bruel & Kjaer microphone type 4189 serial number 2625249 plus microphone extension lead and extension boom arrangement;
- Bruel & Kjaer calibrator type 4231 serial number 2642929 (UKAS certified).

Sound Insulation Test Of Existing Ground To First Separating Floor:

- Bruel & Kjaer sound level meter type 2260 serial number 2627604 plus Bruel & Kjaer microphone type 4189 serial number 2625249;
- Bruel & Kjaer calibrator type 4231 serial number 2642929 (UKAS certified);
- Bruel & Kjaer Qualifier Software type 7830;
- JBL Eon 10G2 active loudspeaker serial number 24742 on heavy duty stand;
- Crest graphic equaliser type 1131.

APPENDIX D

Sound Insulation Of Existing Separating Floor Construction

Level Difference according to ISO 140-4

Field measurements of airborne sound insulation between rooms

Client: gpad Ltd

Date of test: 28/05/2012

Description and identification of the building construction and test arrangement, direction of measurement:

55 Rochester Place & 3A Wilmot Place, London NW1 9JU

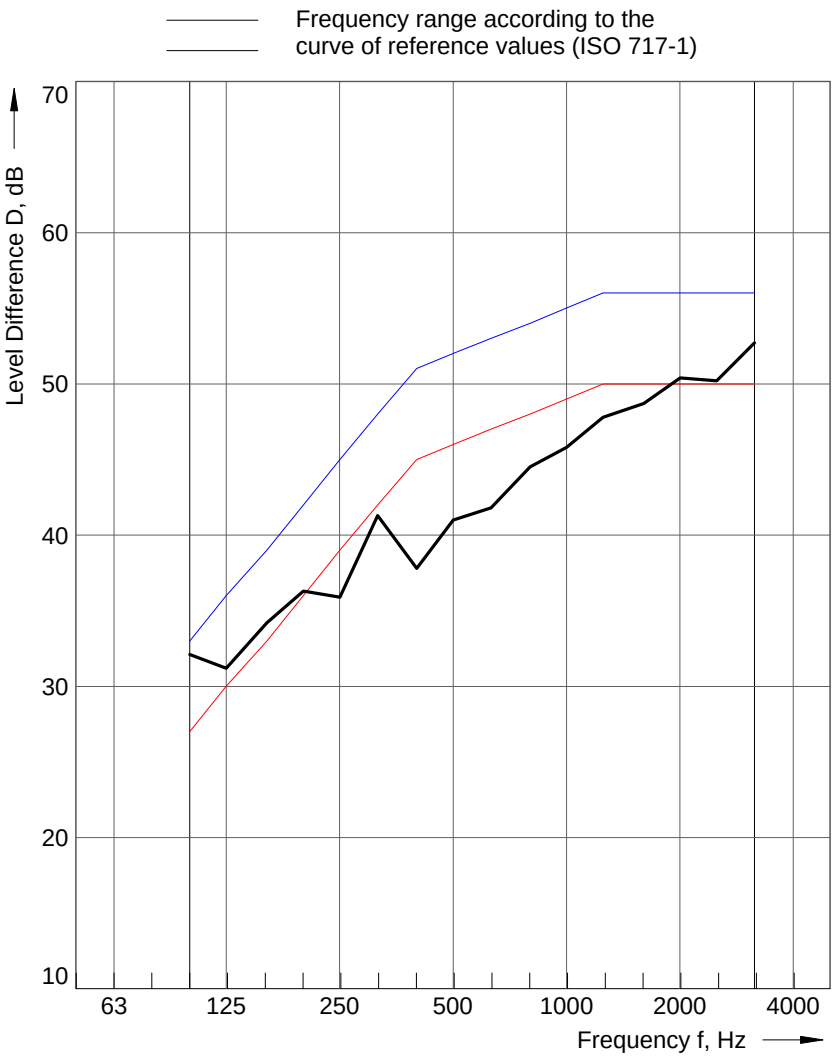
Separating floor test of existing separating ground to first floor.

Source Room: Vacant Ground Floor Area

Receiving Room: Vacant First Floor Area

Source room volume: >50.00 m³
Receiving room volume V: 35.00 m³

Frequency f Hz	D 1/3 Octave dB
50	
63	
80	
100	32.1
125	31.2
160	34.2
200	36.3
250	35.9
315	41.3
400	37.8
500	41.0
630	41.8
800	44.5
1000	45.8
1250	47.8
1600	48.7
2000	50.4
2500	50.2
3150	52.7
4000	
5000	



Rating according to ISO 717-1

D_w = 46 dB

Evaluation based on field measurement results obtained in one-third-octave bands by an engineering method

No. of test report: Floor Test 12118

Name of test institute: Philip Acoustics Ltd

Date: 14/06/2012

Signature: D R Philip

APPENDIX E

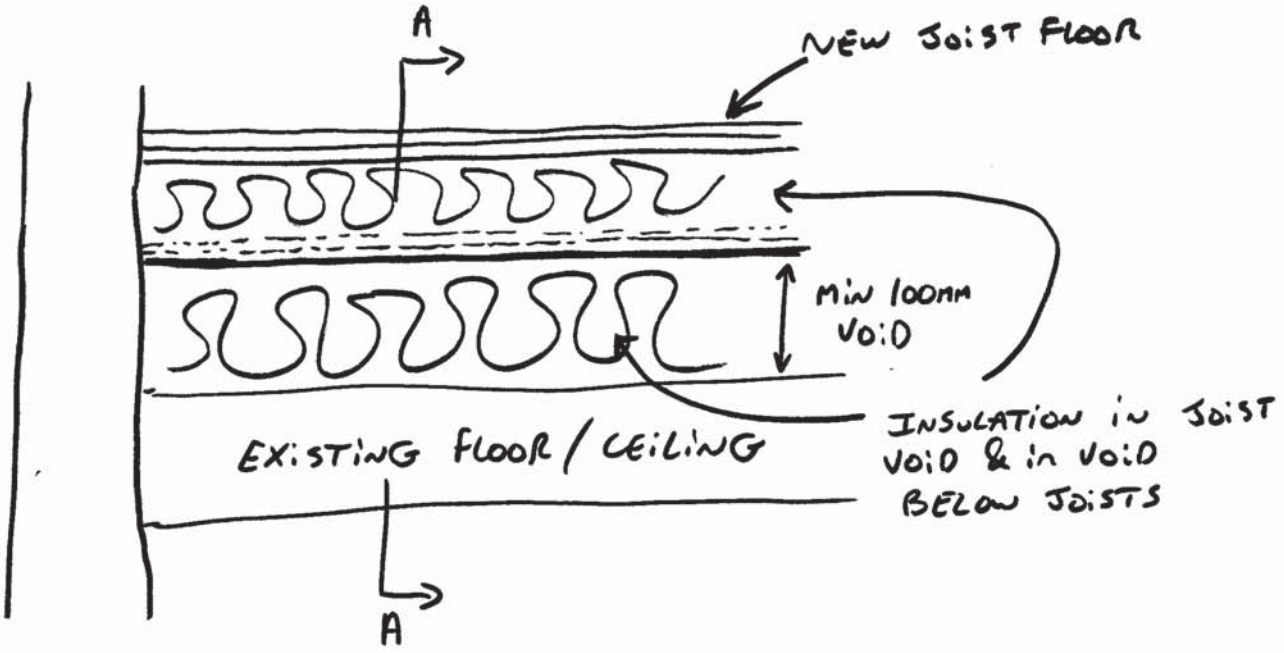
Details For Separating Floor & Separating Wall

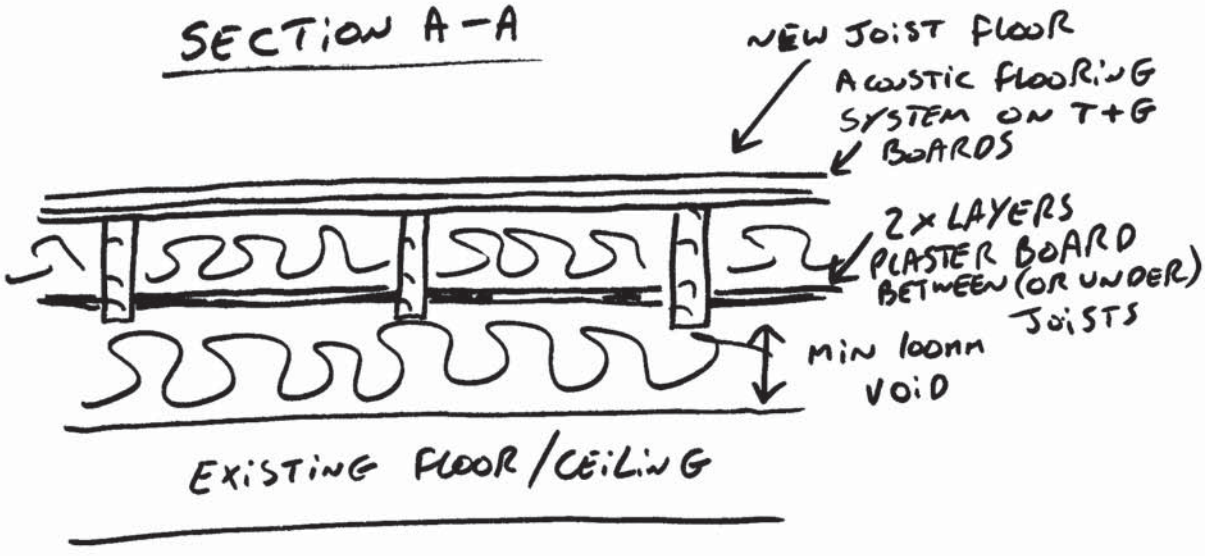
Site: 55 Rochester Place & 3A Wilmot Place, London NW1 9JU

Ref: 12118-002 Apendix E

Date: June 2012

CONCEPT SKETCH DRAWING OF SEPARATING FLOOR UPGRADE TREATMENT





CONCEPT ONLY - NOT TO SCALE

PHILIP ACOUSTICS LTD

107 Bancroft, Hitchin, Hertfordshire, SG5 1NB Tel: 01462 431877 Fax: 01462 431764

E-mail: admin@philipacoustics.co.uk

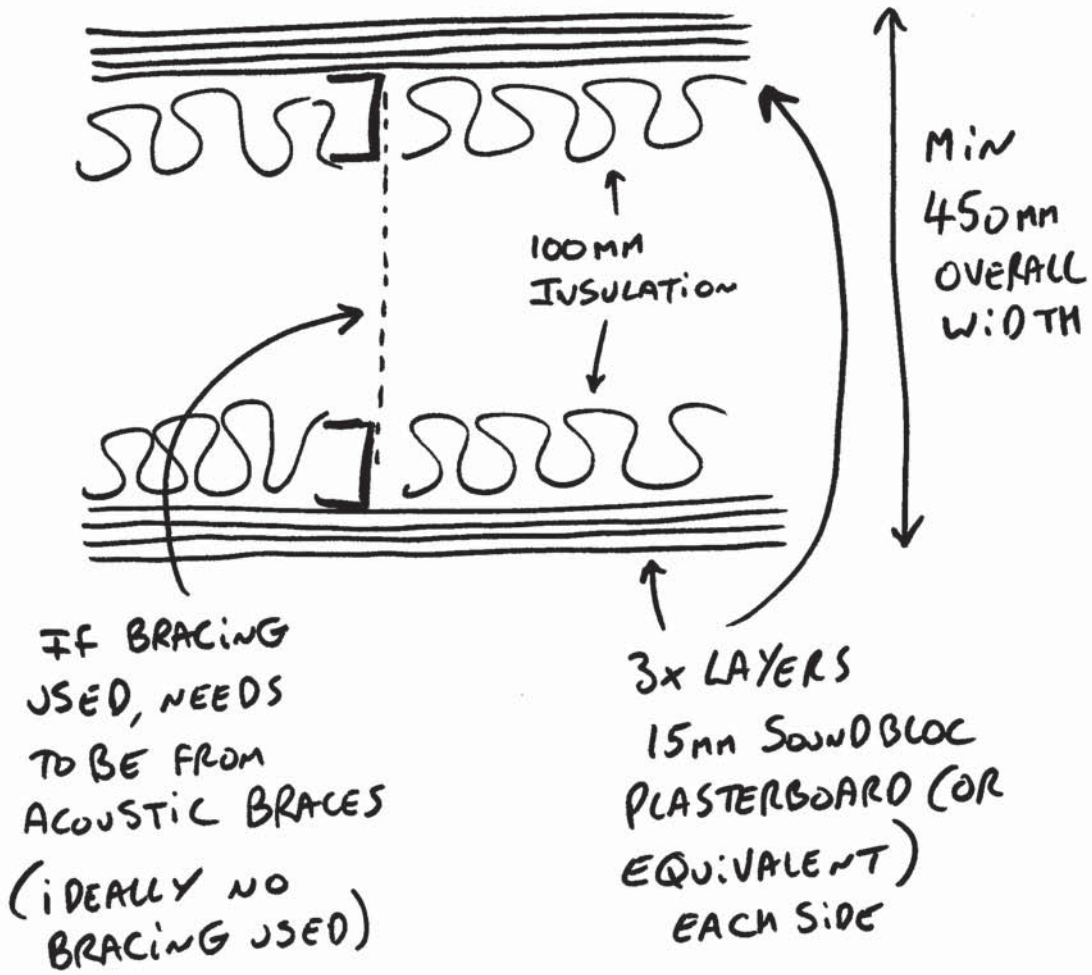
Member of The Association of Noise Consultants Registered in England No.: 4560265

Site: 55 Rochester Place & 3A Wilmot Place, London NW1 9JU

Ref: 12118-002 Apendix E

Date: June 2012

CONCEPT SKETCH DRAWING OF SEPARATING WALL



CONCEPT ONLY – NOT TO SCALE

PHILIP ACOUSTICS LTD

107 Bancroft, Hitchin, Hertfordshire, SG5 1NB Tel: 01462 431877 Fax: 01462 431764

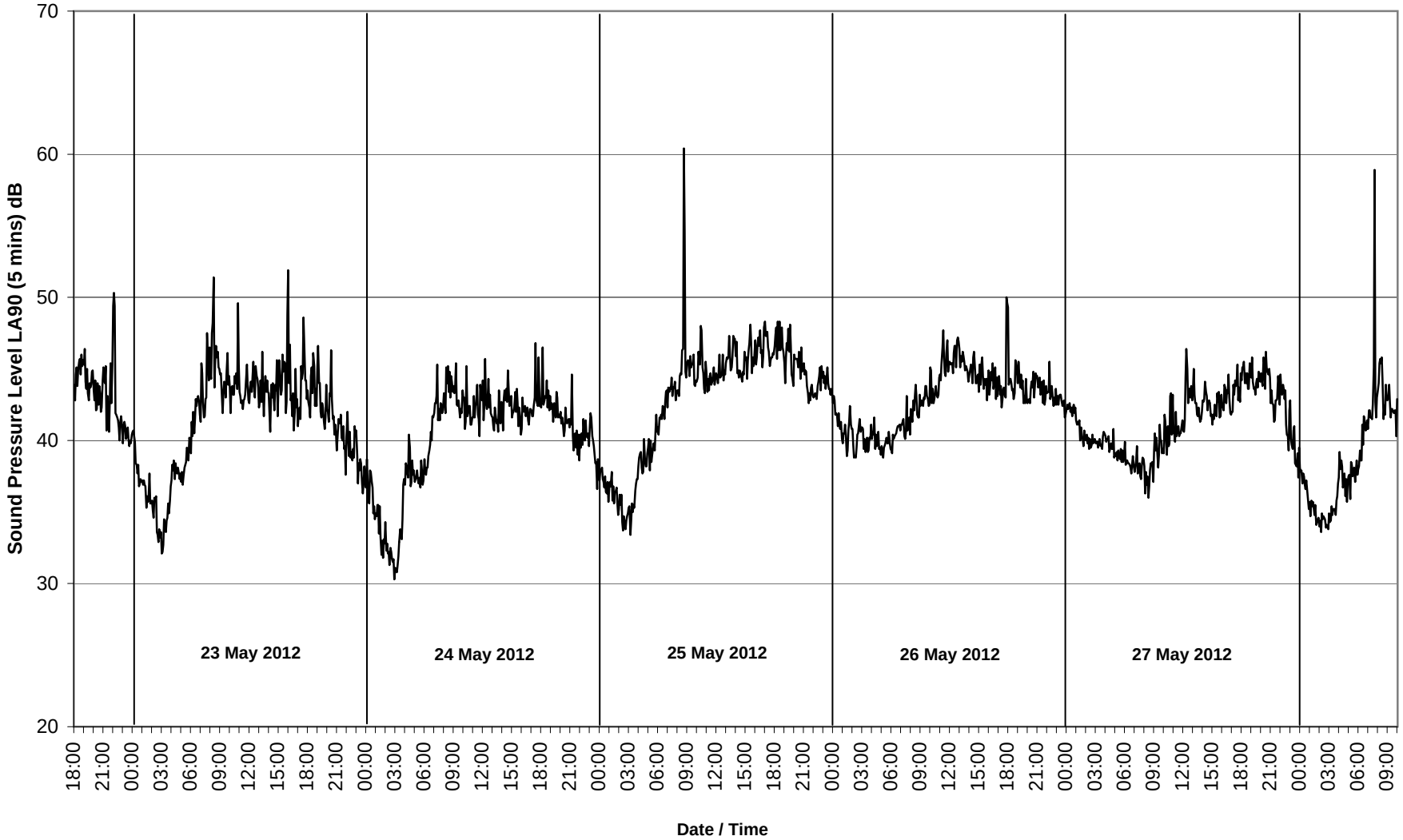
E-mail: admin@philipacoustics.co.uk

Member of The Association of Noise Consultants Registered in England No.: 4560265

APPENDIX F

Background Noise Survey Results

BACKGROUND NOISE SURVEY RESULTS OVER A SEVEN DAY MEASUREMENT PERIOD
AT 55 ROCHESTER PLACE, LONDON NW1 9JU



APPENDIX G

Delivery Noise BS4142 Calculation & Assessment

Site: 55 Rochester Place & 3A Wilmot Place, London NW1 9JU

Ref: 12118-002 Appendix G

Date: June 2012

ACOUSTIC CALCULATION SHEET

ASSESSMENT POSITION: Nearest first floor windows of the proposed new residential unit to delivery doors area

NOISE CONDITION: BS4142 Assessment; "out of hours" delivery Specific Noise Levels over 5 minute period, typical delivery from Transit style van

NOISE MITIGATION: None

Noise Source	Source noise level at 3m Leq (1 min) dBA *(see note A)*	Correction for distance (7m) to receiver position dB *(see note B)*	Correction for any acoustic reflections dB *(see note C)*	Correction for any acoustic screening *dB (see note D)*	Correction for source noise on-time in a 5 minute period dB *(see note E)*	Specific Noise Level at receiver position dBA
Transit type van drives up and stops, driver gets out and shuts door	60	-7	0	0	-10	43
Unloading / Loading boxes manually b hand using hydraulic pallet truck	65	-7	0	0	0	58
Unloading / Loading boxes manually b hand using trolley	53	-7	0	0	0	46
					Overall Specific Noise Level at receiver position dBA	59

Notes

Note A: Source noise is sound pressure level at 3m measured in situ (i.e. not free-field) so includes any normal contributions from reflection

Note B: Distance correction is to allow additional distance to receiver position

Note C: No corrections for any reflections as source noise levels already include normal reflections off adjacent walls of buildings

Note D: No screening allowed

Note E: Correction to account that specific noise may not occur continuously over a 5 minute period of assessment as required by BS4142

PHILIP ACOUSTICS LTD

107 Bancroft, Hitchin, Hertfordshire, SG5 1NB Tel: 01462 431877 Fax: 01462 431764

E-mail: admin@philipacoustics.co.uk

Member of The Association of Noise Consultants Registered in England No.: 4560265

Site: 55 Rochester Place & 3A Wilmot Place, London NW1 9JU

Ref: 12118-002 Appendix G

Date: June 2012

BS4142 NOISE ASSESSMENT FOR "OUT OF HOURS" DELIVERY TO B1 COMMERCIAL USE

The potential noise impact from possible "out of hours" delivery activity is assessed by comparing the specific activity noise level, produced by servicing activity, with the background noise levels in the area.

Section 5 of report 12118-002 describes details used for the assessment with regard to delivery activity noise levels, in order to give the Specific Noise Level.

As required by the noise assessment procedures in BS4142, the assessment includes an addition of +5dB to the Specific Noise Level to give the Rating Level to pessimistically allow for character of the delivery activity noise being potentially more annoying than a more steady type of noise.

Details of the BS4142 assessment for "out of hours" delivery noise are provided in the table below, the assessment is to position outside nearest windows of the proposed new residential unit.

Time	Specific Noise at Position LAeq (i)	Character Correction for Delivery Noise (ii)	Rating Level (iii=i+ii)	Lowest Background Noise Level LA90 (5 min) (iv)	Excess of Rating Level over Background Level (iii-iv)	Comments
Deliveries in range 6am to 10pm	59dB	+5dB	64dB	38dB	+26dB	Rating level more than +5dB above background noise level, BS4142 advises noise complaints possible

PHILIP ACOUSTICS LTD

107 Bancroft, Hitchin, Hertfordshire, SG5 1NB Tel: 01462 431877 Fax: 01462 431764

E-mail: admin@philipacoustics.co.uk

Member of The Association of Noise Consultants Registered in England No.: 4560265