



32 Lawn Road, Camden

Planning Application by Fairview Estates (Housing) Ltd

Noise Assessment

October 2014






Fairview NEW HOMES Ltd.







CLIENT:
Fairview Estates (Housing) Limited
50 Lancaster Road
Enfield, Middlesex, EN2 0BY

PROJECT:

Impact of Road and Urban Noise Sources on Proposed Residential Development in Support of Planning Application.

SITE LOCATION: 32 Lawn Road, Camden, London, NW3 2XU

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Principal Acoustic Consultant

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1. INTRODUCTION

This report has been produced by Grant Acoustics on behalf of Fairview Estates (Housing) Ltd ('Fairview'). It accompanies an application for full planning permission for a redevelopment at 32 Lawn Road, Camden, NW3. The Local Authority has been contacted to agree the method for the noise survey and obtain their criteria for a site such as this.

The survey results have been given along with octave band noise calculation results to give guidance on the mitigation required for proposed residential dwellings in terms of noise from road traffic and general urban noise sources.

1.1 SITE LOCATION:

The site is located within the Belsize Park/Gospel Oak area of NW3, between Lawn Road to the west and Upper Park Road to the east, south of the junction with Fleet Road. Lawn Road has frequent, but not continuous road traffic with parking along one side closest to the proposed development site. To the east of the site is Upper Park Road which is a dead end road giving access to existing apartments. There are also existing apartments directly to the south of the site.

1.2 EXISTING SITE DESCRIPTION:

The site covers approximately 0.25ha and currently contains two existing buildings. These comprise a former car park building, now utilised as seven (part vacant) commercial units with under croft car parking, and a former launderette, most recently used as a community centre. There is hardstanding between the buildings with some landscaped areas.

Figure 1 shows the location of the site relative to the surrounding area along with the noise monitoring positions.

1.3 PROPOSED SITE DESCRIPTION:

Fairview is seeking full planning permission to redevelop the site for a residential scheme to provide 73 units. All dwellings will be designed to Lifetime Homes standards. Seven of the units will be designed as Wheelchair Homes.

The scheme will comprise one apartment block extending to a maximum of seven storeys in height. The development is being brought forward as a car-free scheme with no general car parking spaces provided. Provision for 4 on-street disabled parking bays is proposed, with three spaces created on Lawn Road and one on Upper Park Road adjacent to the entrance. Managed amenity areas will be provided and will generally be screened from Lawn Road. **Figures 2 and 3** show the illustrative site layout.

2. LOCAL AUTHORITY CRITERIA

The Environmental Health Department at the London Borough of Camden has been contacted to establish their criteria and agree the survey methodology relating to noise prior to visiting the site.

2.1 AGREED SURVEY METHODOLOGY:

The EHO, Helen Masterson, confirmed that a noise survey over a typical 24-hour weekday period is acceptable and that the guidance given in their Development Policy DP28 – Noise and Vibration **[1]** must be considered and which refers to PPG24 **[2]** which has now been superseded by the NPPF **[3]**. Internal and external noise criteria as described in BS8233:2014 **[4]** and The World Health Organisation (WHO) **[5]** will also be considered as agreed.

2.2 LEGISLATION AND POLICY:

The Government's policies on noise related planning issues are set out within the National Planning Policy Framework (NPPF) which makes reference to the Noise Policy Statement for England (NPSE) **[6]**.

"Noise Policy Statement for England (NPSE)"

The NPSE provides clarification to the underlying principles and aims in existing policy documents, legislation and guidance that relate to noise. The principal aims of the NPSE are stated as follows in Section 1.7 of the document:

"Through the effective management and control of environmental, neighbour and neighbourhood noise within the context of Government policy on sustainable development:

- *avoid significant adverse impacts on health and quality of life;*
- *mitigate and minimise adverse impacts on health and quality of life;*
- *and where possible, contribute to the improvement of health and quality of life."*

"National Planning Policy Framework (NPPF)"

The National Planning Policy Framework (NPPF) set out the Government's planning policies for England and how they are expected to be applied. It provides a framework within which local authorities are to prepare local plans and use their planning powers to minimise the adverse impact of noise. It contains the following in relation to noise impacts found in Section 11, paragraph 123:

"Planning policies and decisions should aim to:

- *Avoid noise from giving rise to significant adverse impacts on health and quality of life as a result of new development;*
- *Mitigate and reduce to a minimum other adverse impacts on health and quality of life arising from noise from a new development, including through the use of conditions;*

- *Recognise that development will often create some noise and existing businesses wanting to develop in continuance of their business should not have unreasonable restrictions put on them because of changes in nearby land uses since they were established;*
- *Identify and protect areas of tranquillity which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason."*

"Greater London Authority"

The Mayor of London's Ambient Noise Strategy sets out London-wide policy aims for the control of noise. The Strategy considers a wide range of issues relating to noise which may affect this particular development. These include noise from transportation sources, known as ambient noise, and construction activities, which are described as neighbourhood noise.

The general objectives are identified as minimising the adverse impacts of road traffic noise and improving noise environments in London's neighbourhoods, especially for housing, schools, hospitals and other noise sensitive uses. The strategy states the following policies for urban noise-sensitive development:

- *"Minimising the existing and potential adverse impacts of noise on, from, within, or in the vicinity of, development proposals;*
- *Separating new noise sensitive development from major noise sources wherever practicable;*
- *Supporting new technologies and improved practices to reduce noise at source, especially in road, rail and air transport;*
- *Reducing the impact of traffic noise through highway management and transport policies*
- *Containing noise from late night entertainment and other 24-hour activities, and where appropriate promoting well-managed designated locations; and,*
- *Identifying areas of relative tranquillity, which it is intended should be protected or enhanced.*

The Mayor will work with strategic partners to ensure that the transport, spatial and design policies of this plan support the objectives, policies and proposals set out in the London Ambient Noise Strategy."

Additional Relevant Guidance

In addition to the above mentioned planning policy, the following British Standards and guidance documents are considered relevant to the assessment of noise in respect of this project:

"British Standard BS8233:2014, Sound Insulation and Noise Reduction for Buildings – Code of Practice.

The 1999 Standard has now been superseded by the 2014 document. The scope of this Standard is the provision of recommendations for the control of noise in and around buildings. It suggests appropriate criteria and limits for different situations, which are primarily intended to guide the design of new or refurbished buildings undergoing a change of use rather than to assess the effect of changes in the external noise climate.

This standard suggests suitable internal noise levels within different types of buildings, including residential dwellings. It suggests that an internal noise level of 30 $dBL_{Aeq,T}$ within bedrooms is a 'good' standard, whilst 35 $dBL_{Aeq,T}$ is a 'reasonable' standard. For living areas in the daytime, the standard recommends 35 $dBL_{Aeq,T}$ as a good standard in Living rooms and 40 $dBL_{Aeq,T}$ as being a good standard for dining rooms.

BS8233 also states that individual noise events should not exceed 45dBL_{Amax} in bedrooms at night.

"World Health Organisation: Guidelines for Community Noise – 1999"

This document states that, in dwellings, the critical effects of noise are on sleep, annoyance and speech interference. According to this document, to protect the majority of people from being seriously annoyed during the daytime, the sound pressure level on balconies, terraces and outdoor living areas should not exceed

55dBL_{Aeq} for a steady, continuous noise. To protect the majority of people from being moderately annoyed during the daytime, the outdoor sound pressure level should not exceed 50dBL_{Aeq}.

To avoid any possibility of sleep disturbance, indoor guideline values for bedrooms are 30dBL_{Aeq} for continuous noise and 45dBL_{Amax} for single sound events. These indoor noise levels correspond to sound pressure levels at the outside façades of the living spaces of 45dBL_{Aeq} and 60dBL_{Amax}. These values have been obtained by assuming that the noise reduction from outside to inside with the window partly open is 15dB(A).

"Camden Development Policy: DP28 – Noise and Vibration 2010-2015"

A description of the relevant noise policy is copied from the Local Development Framework below and has been considered in this assessment.

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.

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.

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)

2.3 NOISE CRITERIA:

The following internal criteria have been adopted as agreed with the EHO to achieve a 'good' standard of internal noise level within all habitable rooms:

Daytime Living rooms:	35dBL_{Aeq} (0700-2300hrs)
Night time bedrooms:	30dBL_{Aeq} (2300-0700hrs), 45dBL_{Amax}

Mitigation in terms of glazing and ventilation will be given. External noise levels will be compared with the criterion set within the World Health Organisation guidelines of not to exceed 55dB$L_{Aeq,16\ hr}$.

3. SURVEY DETAILS

3.1 NOISE SURVEY DETAILS:

The noise survey was undertaken from Wednesday 10th to Thursday 11th September 2014 over a typical 24-hour weekday period. Two noise meters were set up to measure the existing noise environment with samples taken across the site measure noise decay and obtain octave band frequency data.

Noise monitoring position 1 (MP1) was located at a position suitable to measure noise affecting the northern façade of the work unit building. The microphone was set at roof level at the top of the emergency stairwell and had full line of site to Fleet Road (approx 50m away) and partial line of site to Lawn Road and Upper Park Road. This location was chosen due to security on site and to ensure that the measurements were not affected by screening from the Community Centre.

Noise Monitoring Position 2 (MP2) was located above the wall surrounding the existing roof play area so as to have line of sight to Lawn Road. The microphone was approximately 10m from the edge of the nearside carriageway and was mainly screened from the other surrounding roads.

Sample noise measurements (a-c) were taken at various positions around the site to establish noise decay and obtain octave band centre frequency (Hz) data. The microphone position was approximately 1.5m above existing ground height set on a tripod.

Figure 1 shows the location of the site and all the noise monitoring positions.

3.2 NOISE SURVEY EQUIPMENT:

The noise meters were set up to measure over 15-minute time intervals for the duration of the 24-hour survey and 5-minute intervals for the sample measurements. The parameters recorded include:

- L_{90} – Is the level exceeded for 90% of the total sample time. The L_{90} level is often referred to as the background noise level.
- L_{eq} – Is the equivalent continuous noise level over the sample also referred to as the average noise level.
- L_{Max} – Is the maximum noise level reached during a sample period.
- L_{10} – Is the noise level exceeded for 10% of the time period. This is generally accepted as the noise level from road traffic.

The equipment used in the survey includes:

- 2 x Cirrus Optimus Green CR:171B sound analysers
- 1 x Environmental kit type CK:670
- 1 x environmental kit type CK:680.
- Calibrator type CR:515
- Anemometer and wind shields.
- Tripod.

The sound level meters were calibrated before and after the survey with the Cirrus meters calibrating to 93.7dB at 1kHz.

3.3 WEATHER CONDITIONS:

The weather conditions during the survey were calm and dry and warm with day time temperatures of approximately 19 degrees Celsius on the Wednesday. Wind speeds were measured as typically less than 1.5m/sec on average during the day. Overnight it was dry and calm and sunny on the Thursday therefore allowing unaffected noise measurements to be taken.

4. NOISE SURVEY RESULTS

The survey results have been analysed and are summarised in Table 4.1 below for ease of reference for day and night periods. Results have been rounded to the nearest whole dB(A). The full noise survey results are given as **Appendix 1** of this report.

Table 4.1: Summary of Survey Results – MP1 and MP2

Time Period	Log L_{Aeq}	Range $L_{Amax,F}$ (Log Average)	Av L_{A10}	Av L_{A90}
MP1:				
Day (0700-1900hrs)	59	64-84	58	50
Evening (1900-2300hrs)	55	64-84	57	48
Night (2300-0700hrs)	51	56-87* (69)	52	43
MP2:				
Day (0700-1900hrs)	53	63-80	56	47
Evening (1900-2300hrs)	52	63-76	55	45
Night (2300-0700hrs)	48	51-84* (66)	48	42

*Maximum of 87dB(A) only occurred once and was due to a noisy vehicle engine. This has not therefore been included in the log average L_{Amax}.

Sample survey results are shown in Table 4.2 below. These give an indication of noise levels across the site. Full sample results are shown in **Appendix 2**.

Table 4.2: Sample Noise Survey Results

Location	L_{Aeq}	$L_{Amax,F}$	L_{A10}	L_{A90}
a: Facing Fleet Road	55-59	68-75	57-61	47-50
b: Facing Lawn Road	58-61	72-74	62-65	46-48
c: Facing Upper Park Road	47-49	55-58	49-52	44-46

The proposed development experiences noise predominantly from road traffic sources along Lawn Road and Fleet Road. There is also to a lesser degree noise from other miscellaneous urban sources such as aircraft at altitude.

5. NOISE MAPPING

For indicative purposes only the software programme SoundPlan has been utilised and noise contours for day, evening and night (0700-1900hrs, 1900-2300hrs and 2300-0700hrs respectively) produced based on the survey measurements taken on site. **Figures 4**, **5** and **6** in the Appendices show noise contours across the site before the development is completed for day, evening and night periods. Noise levels are given at 3dB(A) increments.

Figures 7, 8 and **9** show the noise levels affecting the site once the development is completed during day, evening and night periods, therefore allowing some screening by the development itself from various sources. Noise decay across the site is again shown in 3dB(A) increments.

6. POLICY DP28 ASSESSMENT

A comparison has been made with the Council's policy DP28 and the measured noise levels during the day, evening and night for road sources. This will determine whether planning permission is likely to be granted and whether attenuation measures are required to ensure satisfactory internal noise levels.

Table 6.1 compares the survey results with the relevant criteria 1m from the façade of the proposed development. A distance correction has been included to measurements at MP1 to 35m and MP2 to 7m as the façade of the apartment block will be closer to the road than these measurement locations.

Table 6.1: Comparison of Façade Noise Levels with Policy DP28

Time Period	Noise at Façade $L_{Aeq,T}$	DP28:Table A	DP28 Table B
		Criteria for Sites Adjoining Road	
MP1: Dist corrected			
Day (0700-1900hrs)	61	72	62
Evening (1900-2300hrs)	**57**	72	57
Night (2300-0700hrs)	**53**	66	52
MP2: Dist corrected			
Day (0700-1900hrs)	55	72	62
Evening (1900-2300hrs)	54	72	57
Night (2300-0700hrs)	50	66	52

The results above indicate that planning permission is likely to be granted, however noise mitigation will be required for those facades closest to Fleet Road at night and in the evening as noise levels are just on the level where mitigation is necessary (shown in Bold). Noise levels to facades in the vicinity of MP2 will not require specific mitigation in accordance with the Table above, however to achieve relevant internal criteria, mitigation is proposed as necessary.

It is also required under Policy DP28 that where maximum noise levels exceed 82dB$L_{Amax,slow}$ at night several times in any hour, then mitigation will be required. Maximum noise levels are generally less than 70dB(A) at MP1 and 75dB(A) at MP2, however mitigation will be proposed to ensure that internal criterion is met.

7. RESIDENTIAL NOISE PREDICTIONS

7.1 INTERNAL NOISE PREDICTIONS:

Internal noise levels have been predicted to typical plots and facades across the site in accordance with BS8233:2014 using the octave band methodology and compared with the requirements of the Local Authority. Based on the illustrative layout, room dimensions and window areas, calculations have been undertaken which also take into account the reverberation time within the habitable room.

Internal noise levels have been predicted with windows closed and appropriate ventilation open. Table 7.1 gives the predicted internal noise levels during the day and night. A typical maximum noise level at night of 69dB(A) at MP1 and 66dB(A) at 10m from Lawn Road at MP2 have been taken into account. Distance corrections and screening have been included where relevant.

Table 7.1: Internal Noise Predictions with Windows Closed and Vents Open

Plot / Façade	Day		Night		
	L_{Aeq}	Mitigation	L_{Aeq}	L_{Amax}	Mitigation
Plot 1: Facing Fleet Rd At 35m from road	32	Glazing: Enhanced Ventilation: Type B	26	45	Glazing: Standard Ventilation: Type B
Plot 2: Face Lawn Rd and Upper Park Rd	33	Glazing: Standard Ventilation: Type B	27	44	Glazing: Standard Ventilation: Type A
Plot 4: Facing Upper Park Rd	28	Glazing: Standard Ventilation: Type A	19	40	Glazing: Standard Ventilation: Type A
Plot 5: Facing Lawn Rd At 7m from road	34	Glazing: Standard Ventilation: Type A	26	43	Glazing: Standard Ventilation: Type A
Plot 10: Facing Fleet Rd and Upper Park Rd	31	Glazing: Standard Ventilation: Type A	19	41	Glazing: Standard Ventilation: Type A
Plot 63: Level 5 Facing Fleet Road and Upper Park Rd	35	Glazing: Standard Ventilation: Type B	22	45	Glazing: Standard Ventilation: Type A
Plot 64: Level 5 Facing Upper Park Rd and Lawn Rd	33	Glazing: Standard Ventilation: Type A	29	45	Glazing: Standard Ventilation: Type A
Plot 69: Level 5 Facing Fleet Rd and Upper Park Rd	-	-	26	44	Glazing: Standard Ventilation: Type A
Criteria	*35*		*30*	*45*	

Internal noise levels during the day and night are predicted to fall within the Local Authority criterion of 35dB$L_{Aeq,T}$ and 30dB$L_{Aeq,8hr}$ not to be exceeded with the recommended glazing and ventilation types as indicated above. It should be noted that the daytime noise levels between 0700-1900hrs have been considered in the assessment and so evening internal noise levels will be at least 4dB(A) less than those predicted. Table 7.2 shows the minimum glazing octave band requirements necessary across the site.

Table 7.2: Glazing Requirements – 1/1 Octave Band Sound Reductions

SRI - Octave Band Centre Frequency (Hz)	125	250	500	1k	2k	4k
Standard glazing:*	21	17	25	35	36	31
Enhanced glazing:	26	27	33	39	39	40

*Please refer to **Appendix 3** for Fairview's standard specification details

To achieve the internal noise levels, some habitable rooms in apartments closest to and facing Fleet Road must be fitted with acoustic trickle ventilation / acoustic air bricks and / or enhanced glazing to enable occupants to benefit from ventilation with the windows closed. Table 7.3 shows the minimum octave band values required for different ventilation options.

Table 7.3: Ventilation Requirements – 1/1 Octave Band Frequencies

SRI - Octave Band Centre Frequency (Hz)	125	250	500	1k	2k	4k
Type A: Trickle vents	28	30	32	31	29	30
Type B: Acoustic ventilation	36	35	35	38	42	42

*Please refer to **Appendix 3** for Fairview's ventilation specification details.

It should be noted that the above octave band specifications should be given to the preferred manufacturer supplier to enable them to select an appropriate product. As long as the octave band specifications above are achieved, all ventilation types can be either an acoustic trickle vent or acoustic airbrick depending on other

requirements of the development. **Figures 10** and **11** show the likely required mitigation for facades across the site for ease of reference.

7.2 RESIDENTIAL EXTERNAL NOISE PREDICTIONS:

External noise levels have been predicted to amenity areas on the site, taken to be balconies for apartments where relevant and the communal gardens. Daytime noise levels measured at MP1 and MP2 have been taken into account along with samples where necessary. Where appropriate, screening has been included along with a distance correction. Table 7.4 shows the predicted amenity noise levels to various plots. Noise levels are based on daytime levels between 0700-1900hrs. If balconies are used in the evening then noise levels will be less than those shown below.

Table 7.4: Predicted External Noise Levels – $L_{Aeq,T}$

Plot / Location	**Daytime $L_{Aeq,T}$**
Plot 1: Facing Fleet Road	<63 dB(A)
Plot 4: Facing Upper Park Road	51 dB(A)
Plot 5: Facing Lawn Road	<55 dB(A)
Plot 10: Facing Fleet Road, adjacent to Upper Park Rd	54 dB(A)
Plot 63: Level 5 Facing Fleet Road	58 dB(A)
Plot 64: Level 5 Facing Upper Park Rd	54 dB(A)
Plot 69: Level 5 Facing away from Fleet Rd	<51 dB(A)
Communal Garden: Facing Upper Park Rd and Fleet Rd (Depending on Location in Garden)	51-57 dB(A)
Criterion	*<55*

The WHO states that for gardens and amenity areas, it is desirable that the steady noise level does not exceed 50dB$L_{Aeq,16\ hr}$ and 55dB$L_{Aeq,16\ hr}$ should be regarded as the upper limit.

BS8233:2014 also refers to preferable levels of 55dBL_{Aeq} or less, but also understands that noise levels may be higher than this is urban areas. Amenity noise levels are predicted to fall within the WHO criterion for the majority of plots, however

where balconies exceed the criterion there are alternative areas within the communal gardens that offer a quieter alternative.

8. RECOMMENDATIONS AND CONCLUSIONS

A noise assessment has been undertaken to determine the impact of the existing noise environment on the proposed residential development at 32 Lawn Road, Camden. This assessment has been produced by Grant Acoustics in support of the planning application to be submitted by Fairview. The mitigation measures that are required to enable the Local Authority criteria to be met have been given.

8.1 NOISE MAPPING OF SITE:

Noise contour maps have been created to better illustrate noise decay across the site both with and without the proposed development. These have been based on the noise survey measurements undertaken over a 24-hour period on the site and show day, evening and night time periods in line with Local Authority requirements.

The survey results indicate that planning permission is likely to be granted in line with Policy DP28, however noise mitigation will be required for those facades closest to Fleet Road at night and in the evening as noise levels are just on the level where mitigation is necessary. Noise levels to facades in the vicinity of MP2 will not require specific mitigation in accordance Policy DP28, however to achieve relevant internal criteria, Fairview's standard glazing and ventilation specifications will be adequate.

8.2 RESIDENTIAL INTERNAL NOISE PREDICTIONS:

Internal noise levels have been predicted to typical plots across the development based on the illustrative site layout, room dimensions and glazing areas.

Mitigation will consist of enhanced glazing and / or acoustic ventilation for habitable rooms closest to Fleet Road. All other plots will be adequate with standard glazing and trickle ventilation in habitable rooms.

Figures 10, 11 and **Appendix 3** give a full explanation of the mitigation requirements across the site.

8.3 RESIDENTIAL EXTERNAL NOISE PREDICTIONS:

External amenity noise levels are predicted to fall within the recommended criterion of 55dB$L_{Aeq,T}$ for the majority of plots. Where amenity noise levels exceed the criterion, there are communal garden areas offering a quieter alternative.

8.4 CONSTRUCTION SITE NOISE:

It is required by the Local Authority that Policy DP26 be considered for construction noise. Policy DP26 contributes to the implementation of the Core Strategy by making sure that the impact of a development on occupiers and neighbours is fully considered. An extract from Policy DP26 is copied below for reference.

26.10 Disturbance from development can also occur during the construction phase. Measures required to reduce the impact of demolition, excavation and construction works must be outlined in a Construction Management Plan. We will require Construction Management Plans to identify the potential impacts of the construction phase of the development and state how any potential negative impacts will be mitigated. Construction Management Plans may be sought for:

- major developments;
- basement developments;
- developments involving listed buildings or adjacent to listed buildings;
- developments that could affect wildlife;
- developments on sites with poor or limited access; and
- developments that could cause significant disturbance due to their location or the anticipated length of the, demolition, excavation or construction period.

For further details on construction management plans please refer to our Camden Planning Guidance supplementary. Please see policy DP27 for more on our approach to basements.

The above should be taken in to account when developing a Construction Management Plan.

8.5 CONCLUSION:

To conclude, appropriate mitigation can be provided to ensure internal noise levels are acceptable across the development and within relevant criteria as agreed with the Local Authority.

Although some external amenity areas exceed the relevant criteria, there are quieter communal garden areas that provide a quieter alternative within the criterion.

It is therefore concluded that noise does not present a constraint to the granting of planning permission.

9. REFERENCES

[1] Camden Development Policy: DP28 – Noise and Vibration 2010-2015

[2] PPG24 – *Planning Policy Guidance 24 – Planning and Noise 1994*

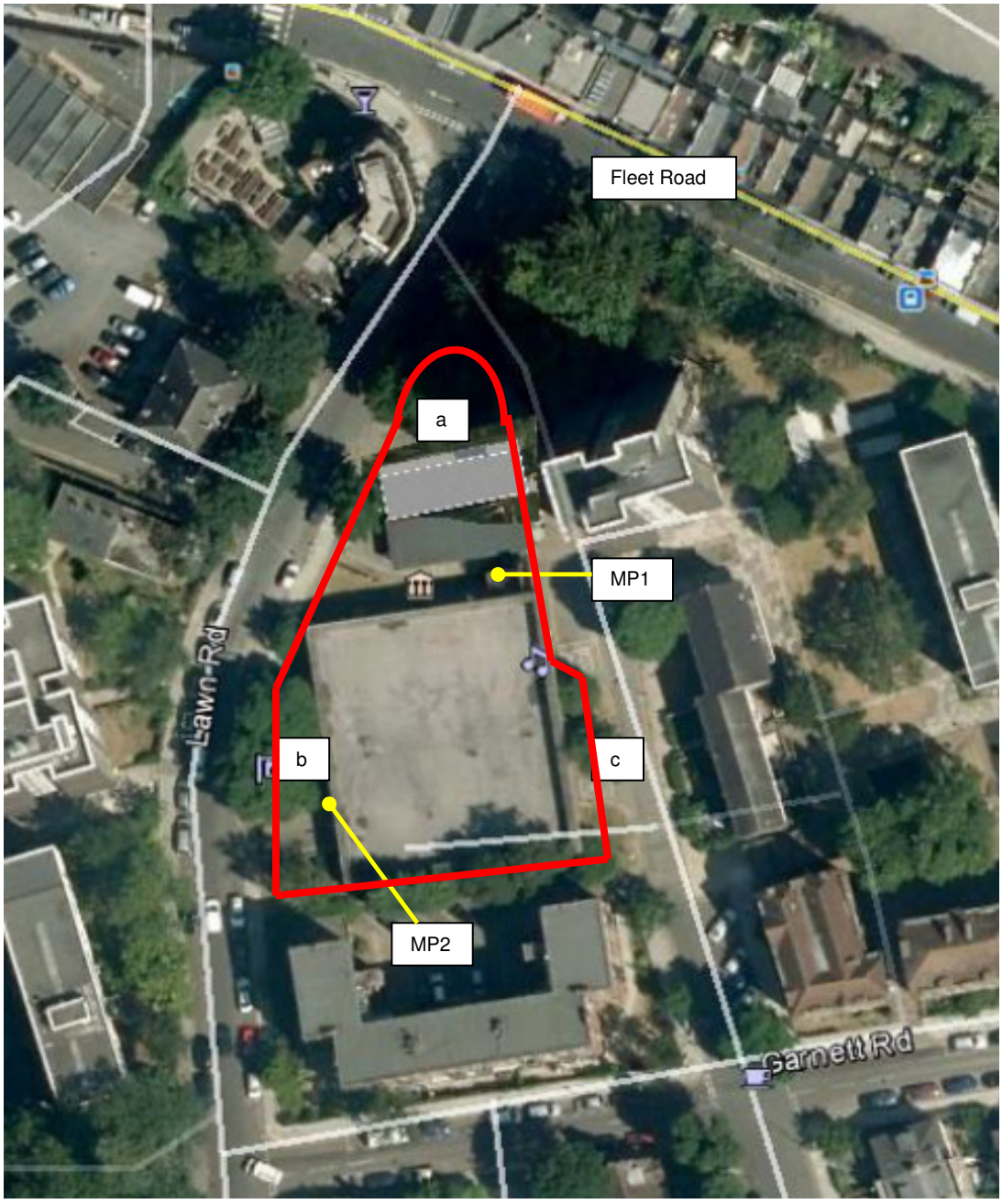
[3] National Planning Policy Framework – Defra. March 2012

[4] BS8233:2014 – *Guidance on Sound Insulation and Noise Reduction for Buildings.*

[5] The World Health Organisation – *Guidelines for Community Noise 1999*.

[6] NPSE – Noise Policy statement for England 2010

Figure 1: Location of Site and Noise Monitoring Positions Relative to Surrounding Area



Site boundary

MP1 / 2 — 24-hour Noise Monitoring Positions

a..b..c — Sample daytime noise monitoring positions

Figure 2: Illustrative Layout of Site: Ground Floor

Plot 1..2..4… Plots considered in assessment

Figure 3: Illustrative Layout of Site: Level 5

Plot 63…64… Plots considered in assessment

Figure 4: Daytime Noise Contours - Existing

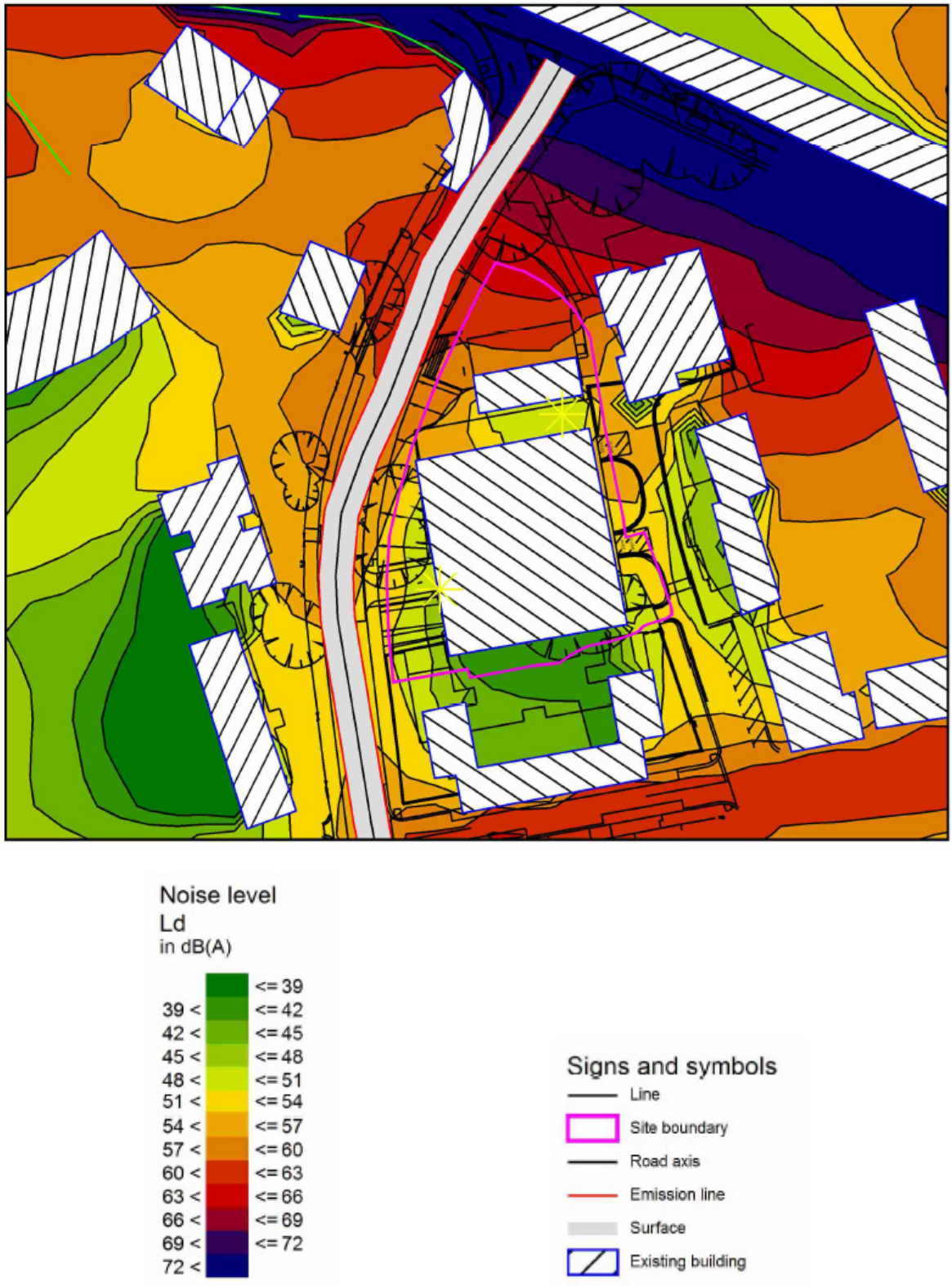


Figure 5: Evening Noise Contours - Existing

Figure 6: Night time Noise Contours - Existing

Figure 7: Day time Noise Contours – Illustrative Site Layout

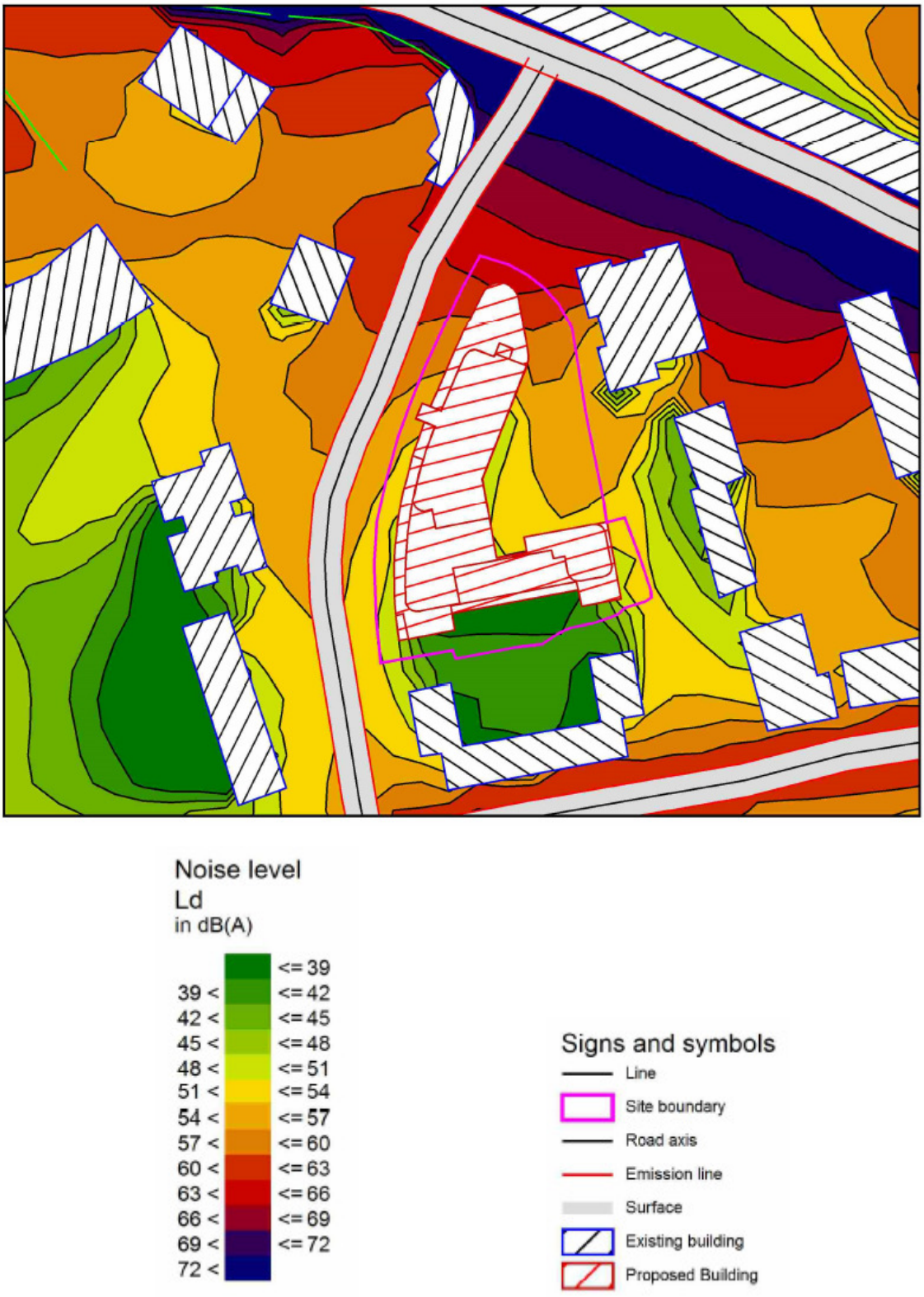


Figure 8: Evening Noise Contours – Illustrative Site Layout

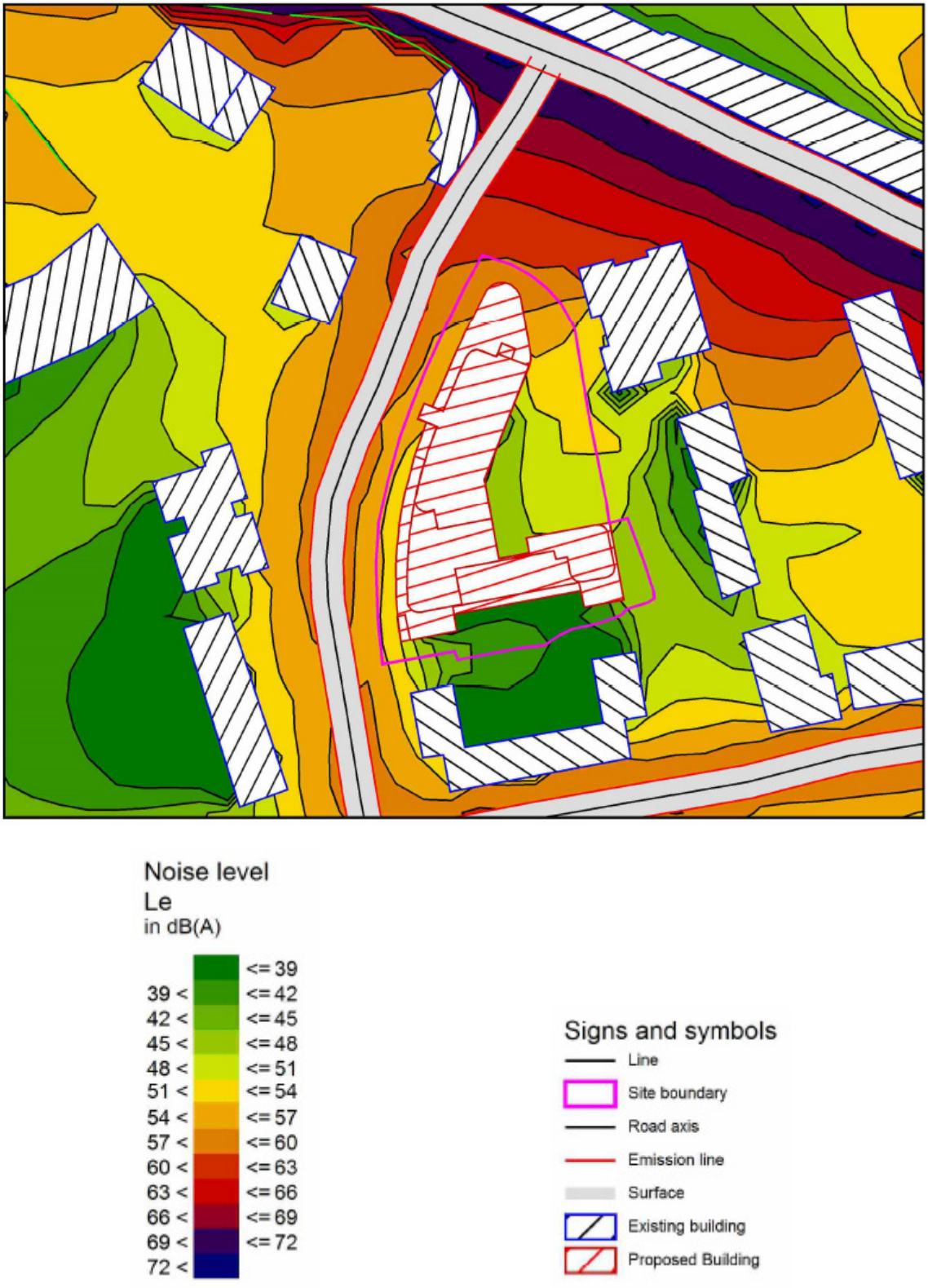


Figure 9: Night time Noise Contours – Illustrative Site Layout

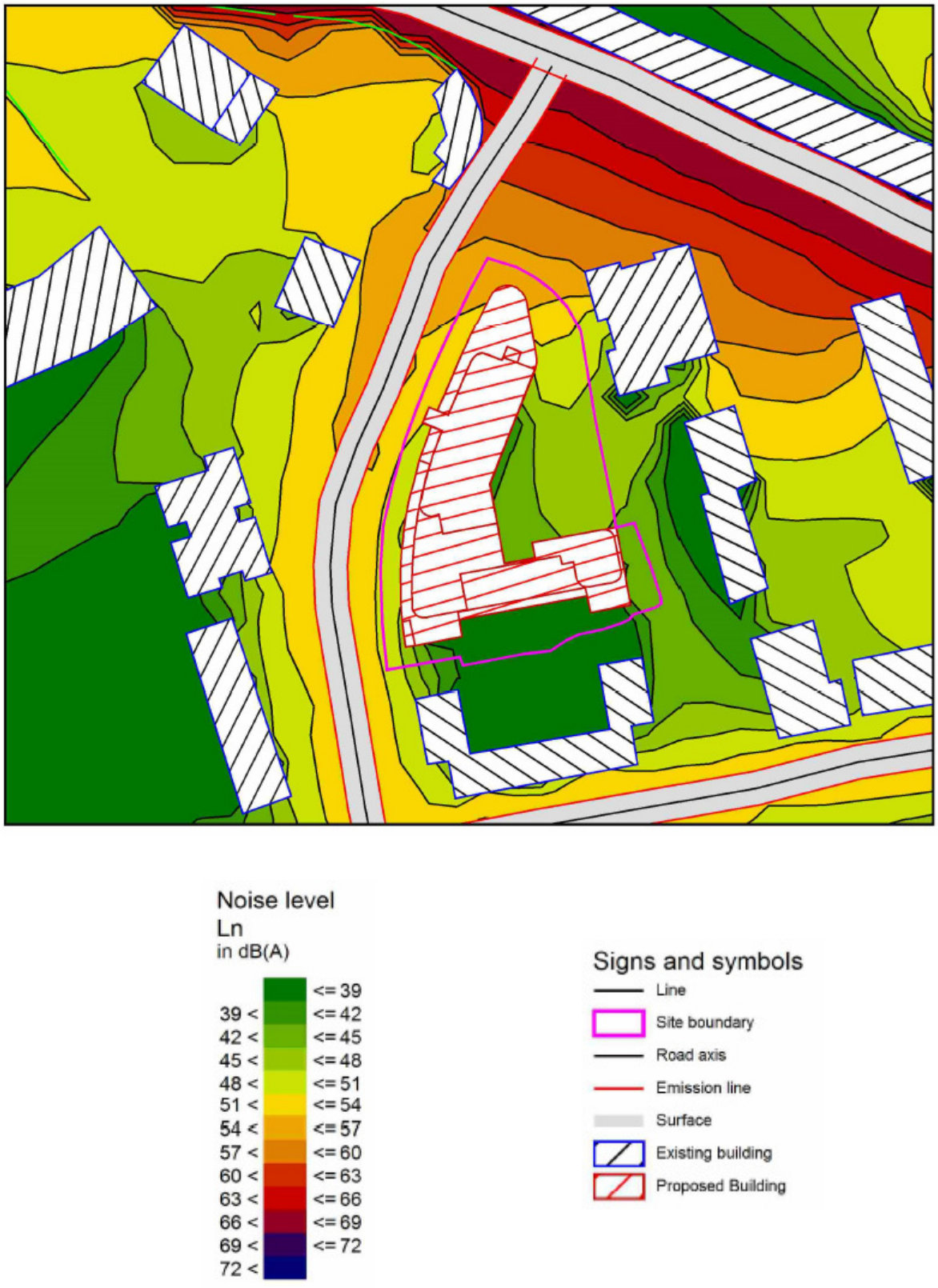


Figure 10: Required Mitigation – Ground Floor

Floors: Ground to 4th Level
Daytime habitable rooms: Enhanced Glazing, Ventilation Type B.
Bedrooms: Standard Glazing, Ventilation Type B

Daytime habitable rooms: Standard Glazing, Ventilation Type B - Ground to 6th Level
Bedrooms: Standard Glazing, Ventilation Type A.

All other facades unmarked will be adequate with Standard Glazing and Ventilation Type A.

Figure 11: Required Mitigation – Level 5

Floors: Level 5 to Level 6:
Daytime habitable rooms: Standard Glazing, Ventilation Type B.
Bedrooms: Standard Glazing, Ventilation Type A.

All other facades unmarked will be adequate with Standard Glazing and Ventilation Type A.

Appendix 1: 24-Hour Noise Survey Results

MP1 Noise Survey Results Facing Fleet Road

Date / Time Period	LAeq	LAmax,f	LA10	LA90
Wednesday Day				
10/09/2014 11:11	57.8	78.7	58.8	51.7
10/09/2014 11:15	72.9	81.1	76.5	52.9
10/09/2014 11:30	56.7	74.6	58	48.2
10/09/2014 11:45	61.9	82.3	62.8	51.2
10/09/2014 12:00	53.8	75.8	55.9	48.8
10/09/2014 12:15	58.1	78.5	61.7	48.4
10/09/2014 12:30	53.6	67.3	56.3	48.3
10/09/2014 12:45	54.6	70.6	57.2	48.2
10/09/2014 13:00	54.1	67.7	57.2	48
10/09/2014 13:15	54.7	67.7	57.3	48.9
10/09/2014 13:30	53.3	64.9	56.4	47.4
10/09/2014 13:45	55	72.2	57.7	49.2
10/09/2014 14:00	53.2	67.3	55.7	48.7
10/09/2014 14:15	52.9	67.4	55.8	46.9
10/09/2014 14:30	53.5	68.4	56.4	47.9
10/09/2014 14:45	53.7	70.6	56.3	48.8
10/09/2014 15:00	54.2	68.7	56.7	49.5
10/09/2014 15:15	53.5	74.7	56.1	48.5
10/09/2014 15:30	55.4	68	57.8	48.9
10/09/2014 15:45	56	75.6	58.5	50.7
10/09/2014 16:00	58	76	59	50.5
10/09/2014 16:15	54.4	68.4	57	49.8
10/09/2014 16:30	55.3	70.7	57.9	49.7
10/09/2014 16:45	56	71.9	58.6	51.1
10/09/2014 17:00	58.8	79.8	61.8	50.8
10/09/2014 17:15	59.1	81.2	57.9	50.6
10/09/2014 17:30	55.5	72.4	57.7	50.5
10/09/2014 17:45	55.3	71.6	57.3	50.6
10/09/2014 18:00	55.7	76.4	57.7	50.6
10/09/2014 18:15	57.5	83.5	57.8	49.9
10/09/2014 18:30	55.1	70.5	57.5	50.4
10/09/2014 18:45	55.4	68.1	58	50.7
10/09/2014 19:00	55.8	71.7	58	50.4
10/09/2014 19:15	55.8	69.5	58.2	51.4
10/09/2014 19:30	56.5	72.2	58.7	51.1
10/09/2014 19:45	59.1	82	58.6	50
10/09/2014 20:00	53.8	67	56.4	49
10/09/2014 20:15	53.6	67.4	56.3	48.6
10/09/2014 20:30	53.2	64.6	56.2	47.6
10/09/2014 20:45	52.8	67.7	55.7	46.7
10/09/2014 21:00	58.2	84.1	57.3	47.4
10/09/2014 21:15	52.4	67	55.4	46.3
10/09/2014 21:30	51.9	66.9	55	46
10/09/2014 21:45	53	68	55	46.6
10/09/2014 22:00	52.4	73.1	55.2	46.5
10/09/2014 22:15	52.5	63.5	55.8	46.5
10/09/2014 22:30	52.2	68.2	55.7	45.5
10/09/2014 22:45	53.6	70.2	56.8	45.3

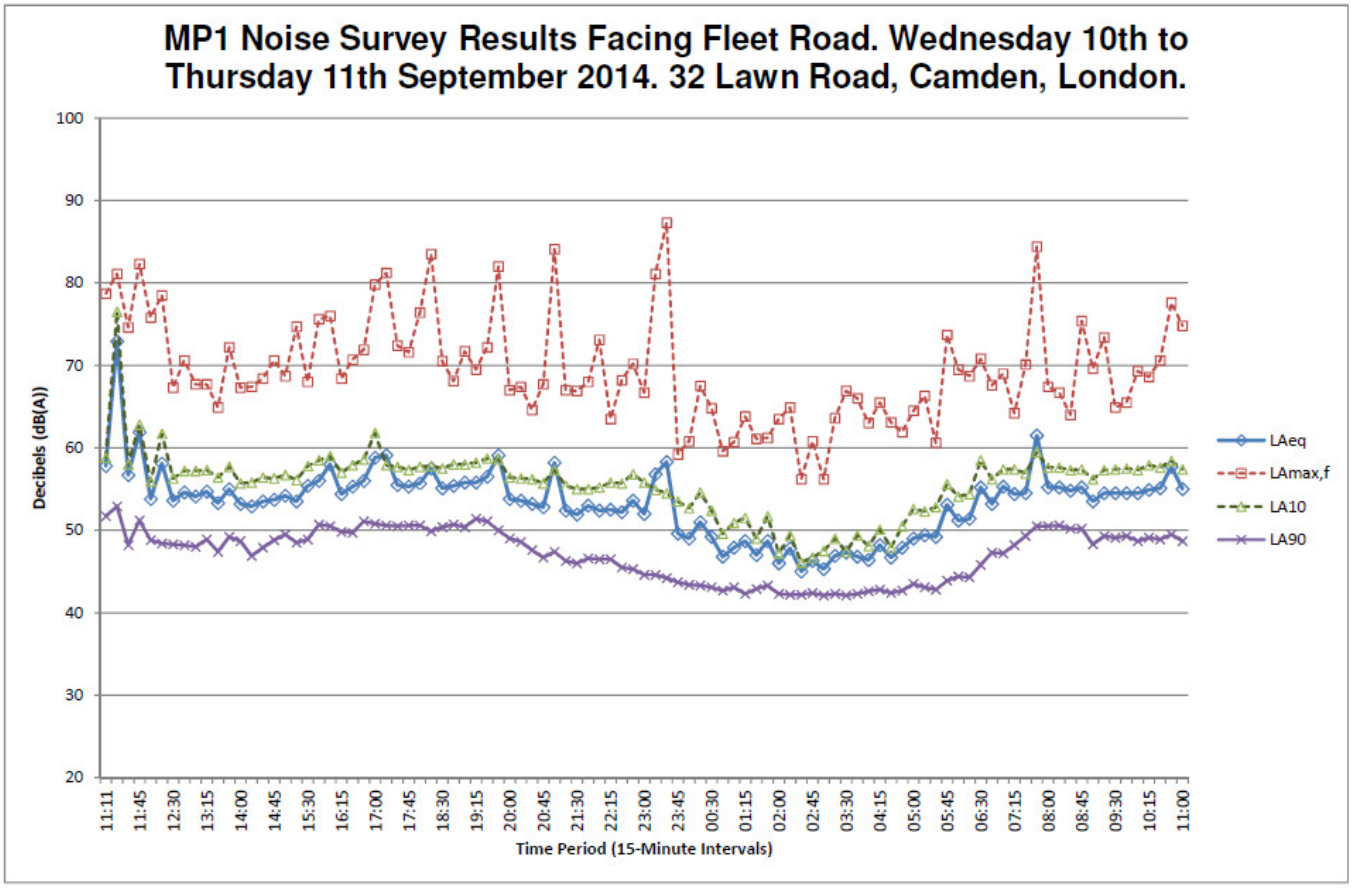
Date / Time Period	LAeq	LAmax,f	LA10	LA90
10/09/2014 23:00	52	66.7	55.8	44.6
10/09/2014 23:15	56.8	81.1	54.9	44.6
10/09/2014 23:30	58.3	87.3	54.5	44.2
10/09/2014 23:45	49.6	59.2	53.5	43.7
10/09/2014 00:00	49	60.8	52.7	43.4

Date / Time Period	LAeq	LAmax,f	LA10	LA90
10/09/2014 00:15	51	67.5	54.6	43.3
10/09/2014 00:30	49.2	64.8	52.4	43.1
10/09/2014 00:45	46.8	59.6	49.6	42.7
11/09/2014 01:00	47.9	60.7	50.9	43.1
11/09/2014 01:15	48.7	63.8	51.5	42.3
11/09/2014 01:30	47	61.1	49	42.9
11/09/2014 01:45	48.7	61.2	51.7	43.3
11/09/2014 02:00	46	63.5	47.2	42.3
11/09/2014 02:15	47.8	64.9	49.4	42.2
11/09/2014 02:30	45	56.2	46.1	42.2
11/09/2014 02:45	46.3	60.8	46.7	42.4
11/09/2014 03:00	45.3	56.2	47.5	42.1
11/09/2014 03:15	46.9	63.6	49	42.3
11/09/2014 03:30	47.3	66.9	47.4	42.1
11/09/2014 03:45	46.8	66	49.4	42.3
11/09/2014 04:00	46.4	63	48.1	42.6
11/09/2014 04:15	48.2	65.5	50.1	42.8
11/09/2014 04:30	46.7	63.1	47.9	42.4
11/09/2014 04:45	47.9	61.9	50.5	42.7
11/09/2014 05:00	49	64.5	52.6	43.5
11/09/2014 05:15	49.4	66.3	52.3	43.1
11/09/2014 05:30	49.2	60.6	52.8	42.8
11/09/2014 05:45	53.1	73.7	55.6	43.9
11/09/2014 06:00	51.2	69.5	54.1	44.4
11/09/2014 06:15	51.4	68.7	54.4	44.3
11/09/2014 06:30	55.2	70.8	58.5	45.8
11/09/2014 06:45	53.2	67.6	56.2	47.3

Date / Time Period	LAeq	LAmax,f	LA10	LA90
11/09/2014 07:00	55.3	69	57.4	47.2
11/09/2014 07:15	54.4	64.2	57.4	48.2
11/09/2014 07:30	54.5	70.1	56.9	49.3
11/09/2014 07:45	61.5	84.4	59.5	50.5
11/09/2014 08:00	55.2	67.4	57.6	50.5
11/09/2014 08:15	55.2	66.7	57.6	50.6
11/09/2014 08:30	54.8	64	57.3	50.2
11/09/2014 08:45	55.2	75.4	57.4	50.2
11/09/2014 09:00	53.5	69.6	56.2	48.3
11/09/2014 09:15	54.5	73.4	57.3	49.3
11/09/2014 09:30	54.5	64.9	57.4	49.1
11/09/2014 09:45	54.5	65.5	57.5	49.3
11/09/2014 10:00	54.5	69.3	57.3	48.7
11/09/2014 10:15	54.9	68.6	57.9	49.1
11/09/2014 10:30	55.1	70.6	57.6	48.9
11/09/2014 10:45	57.7	77.6	58.4	49.5
11/09/2014 11:00	55	74.8	57.4	48.7

Day	58.3	64-84	57.7	49.1
Night	50.8	56-87*	51.5	43.3
	Log Ave:	69	(without engine max)	

* maximum at night is due to a really loud vehicle engine


MP1 Noise Survey Results Facing Fleet Road. Wednesday 10th to Thursday 11th September 2014. 32 Lawn Road, Camden, London.
Decibels (dB(A))
100
90
80
70
60
50
40
30
20
11:11
11:45
12:30
13:15
14:00
14:45
15:30
16:15
17:00
17:45
18:30
19:15
20:00
20:45
21:30
22:15
23:00
23:45
00:30
01:15
02:00
02:45
03:30
04:15
05:00
05:45
06:30
07:15
08:00
08:45
09:30
10:15
11:00
Time Period (15-Minute Intervals)
LAeq
LAmax,f
LA10
LA90

MP2 Noise Survey Results on Roof Facing Lawn Road

Date / Time Period	LAeq	LAmax,f	LA10	LA90
Wednesday Day				
10/09/2014 12:30	53.6	74	55.9	46.2
10/09/2014 12:45	52.9	72.4	55.4	46.5
10/09/2014 13:00	52.9	71.2	56.1	46.6
10/09/2014 13:15	53.3	71.4	56	45.8
10/09/2014 13:30	51.7	72.1	53.7	45.6
10/09/2014 13:45	51.5	67.7	54	46.6
10/09/2014 14:00	51.5	66.2	54.6	45.6
10/09/2014 14:15	50.3	65.9	52.7	45.4
10/09/2014 14:30	51.4	66.5	54.5	45.2
10/09/2014 14:45	51.8	64.2	55.5	46.2
10/09/2014 15:00	52.4	68	55.7	46.4
10/09/2014 15:15	52.6	64.9	56.2	46.7
10/09/2014 15:30	54	71.3	57.5	47.1
10/09/2014 15:45	54	73.6	57.1	47.5
10/09/2014 16:00	55.4	72.1	57.6	47.8
10/09/2014 16:15	52.5	68.7	56.2	46.9
10/09/2014 16:30	54.6	77.3	58.3	47
10/09/2014 16:45	53.8	70.7	57.3	47.4
10/09/2014 17:00	54	69.1	57.5	47
10/09/2014 17:15	55.2	72.3	58.1	47.4
10/09/2014 17:30	53.3	68.2	57.1	47
10/09/2014 17:45	55.1	78.8	56.8	47.6
10/09/2014 18:00	53.4	72.3	57.1	46.8
10/09/2014 18:15	52.9	66.2	56.2	47.6
10/09/2014 18:30	53.7	68.1	56.6	48.3
10/09/2014 18:45	57.1	78.8	59.7	48.7
10/09/2014 19:00	55.1	71.9	58.5	47.8
10/09/2014 19:15	53.7	66.8	56.7	48
10/09/2014 19:30	55.7	76.2	57.1	47.8
10/09/2014 19:45	52.5	65.8	55.7	46.7
10/09/2014 20:00	50.7	66.3	54	45.5
10/09/2014 20:15	52.1	69.8	54.6	46.4
10/09/2014 20:30	51.4	70	53.7	45.1
10/09/2014 20:45	52.1	67.7	55	44.6
10/09/2014 21:00	53.7	71.6	56.9	44.3
10/09/2014 21:15	50.4	64.5	53.4	44.5
10/09/2014 21:30	52.2	70.2	55.7	43.9
10/09/2014 21:45	49.1	63.1	51.4	44.2
10/09/2014 22:00	48.8	64.1	51	44.1
10/09/2014 22:15	51.5	67	54.8	44.7
10/09/2014 22:30	49.6	64.2	52.1	42.9
10/09/2014 22:45	50.6	64.5	54.1	43.4

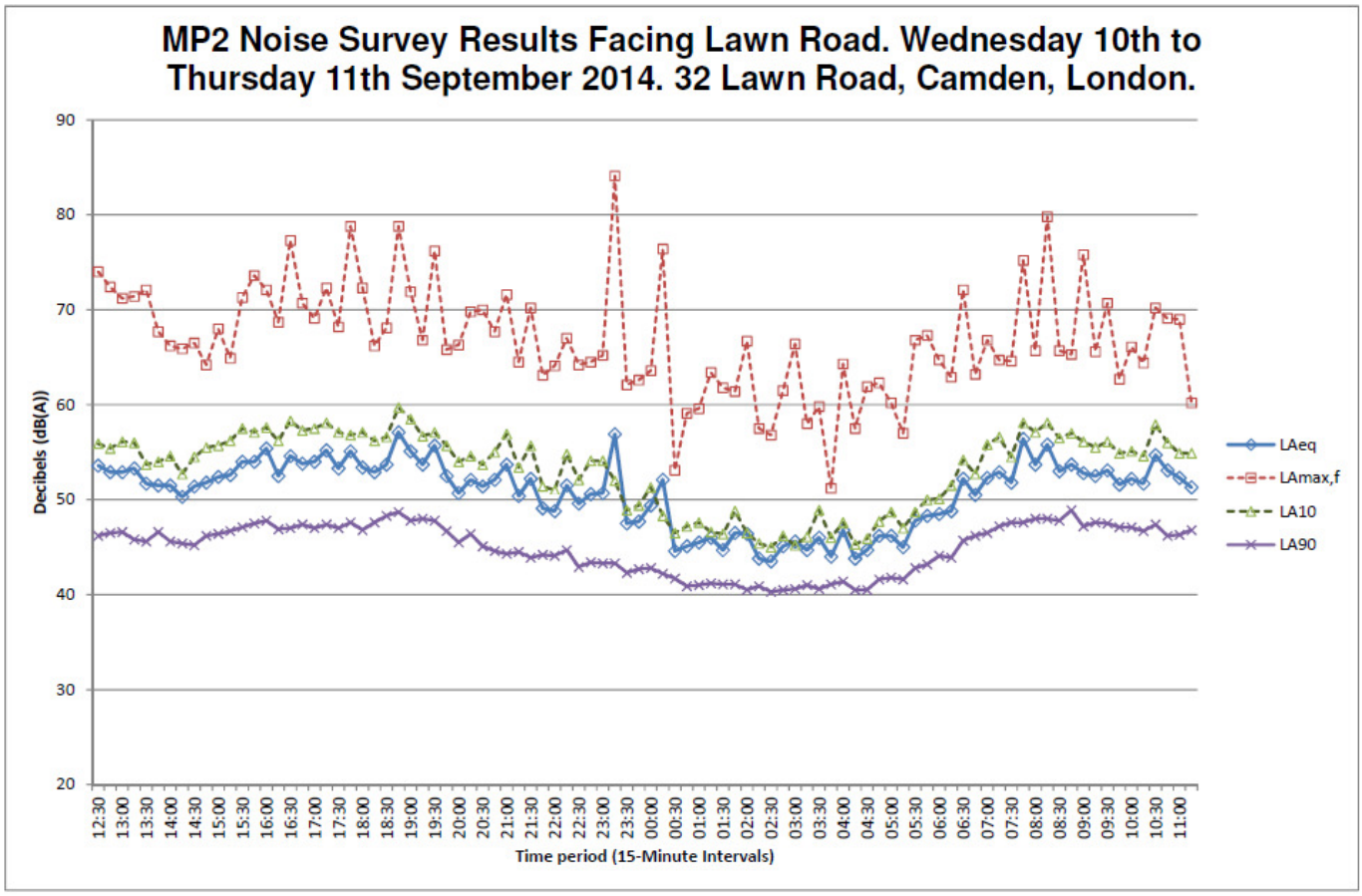
Date / Time Period	LAeq	LAmax,f	LA10	LA90
Wednesday Night				
10/09/2014 23:00	50.7	65.2	54.1	43.3
10/09/2014 23:15	56.9	84.1	52	43.3
10/09/2014 23:30	47.5	62.1	48.9	42.3
10/09/2014 23:45	47.7	62.6	49.4	42.7
11/09/2014 00:00	49.4	63.6	51.3	42.8
11/09/2014 00:15	52.1	76.4	48.3	42.2
11/09/2014 00:30	44.6	53.1	46.5	41.7
11/09/2014 00:45	45.1	59.1	47.2	40.9
11/09/2014 01:00	45.5	59.6	47.6	41

Date / Time Period	LAeq	LAmax,f	LA10	LA90
Wednesday Night cont...				
11/09/2014 01:15	46	63.4	46.6	41.2
11/09/2014 01:30	44.7	61.8	46.4	41.1
11/09/2014 01:45	46.5	61.4	48.8	41.1
11/09/2014 02:00	46.4	66.7	46.5	40.5
11/09/2014 02:15	43.8	57.5	45.4	40.9
11/09/2014 02:30	43.5	56.8	45	40.3
11/09/2014 02:45	45.1	61.5	46.2	40.5
11/09/2014 03:00	45.6	66.4	45.2	40.6
11/09/2014 03:15	44.7	58	46.1	41
11/09/2014 03:30	46	59.8	48.9	40.6
11/09/2014 03:45	44	51.2	46	41.1
11/09/2014 04:00	46.8	64.3	47.6	41.4
11/09/2014 04:15	43.8	57.5	45.3	40.5
11/09/2014 04:30	44.7	61.9	45.9	40.5
11/09/2014 04:45	46.2	62.3	47.7	41.6
11/09/2014 05:00	46.2	60.2	48.7	41.8
11/09/2014 05:15	45	57	47	41.6
11/09/2014 05:30	47.8	66.8	48.7	42.8
11/09/2014 05:45	48.3	67.3	50	43.2
11/09/2014 06:00	48.5	64.7	50.1	44.1
11/09/2014 06:15	48.8	62.9	51.5	43.9
11/09/2014 06:30	52.2	72.1	54.2	45.7
11/09/2014 06:45	50.5	63.2	52.7	46.2

Date / Time Period	LAeq	LAmax,f	LA10	LA90
Thursday Day				
11/09/2014 07:00	52.3	66.8	55.8	46.5
11/09/2014 07:15	52.9	64.7	56.6	47.2
11/09/2014 07:30	51.8	64.6	54.5	47.6
11/09/2014 07:45	56.4	75.2	58.1	47.6
11/09/2014 08:00	53.7	65.7	57.1	48
11/09/2014 08:15	55.8	79.8	58.1	48
11/09/2014 08:30	53	65.7	56.5	47.8
11/09/2014 08:45	53.7	65.3	57	48.9
11/09/2014 09:00	52.8	75.8	56.1	47.2
11/09/2014 09:15	52.5	65.6	55.5	47.6
11/09/2014 09:30	53.1	70.7	56.1	47.5
11/09/2014 09:45	51.6	62.7	54.9	47.1
11/09/2014 10:00	52.2	66.1	55.1	47.1
11/09/2014 10:15	51.7	64.4	54.6	46.7
11/09/2014 10:30	54.7	70.2	57.9	47.4
11/09/2014 10:45	53.1	69.1	56	46.2
11/09/2014 11:00	52.3	69	54.9	46.3
11/09/2014 11:15	51.3	60.2	54.9	46.8

Day	53.1	63-80	55.8	46.5
Night	48.4	51-84*	48.3	42.0
	Log max:	65.7	(excluding vehicle engine)	

* Maximum due to noisy vehicle engine.


MP2 Noise Survey Results Facing Lawn Road. Wednesday 10th to Thursday 11th September 2014. 32 Lawn Road, Camden, London.
Decibels (dB(A))
90
80
70
60
50
40
30
20
12:30
13:00
13:30
14:00
14:30
15:00
15:30
16:00
16:30
17:00
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04:30
05:00
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06:00
06:30
07:00
07:30
08:00
08:30
09:00
09:30
10:00
10:30
11:00
Time period (15-Minute Intervals)
LAeq
LAmax,f
LA10
LA90

Appendix 2: Sample Noise Survey Results

Sample Noise Survey Results

Date / Time Period	Duration	Position	LAeq	LAmax,f	LA10	LA90	Comments
10/09/2014 11:27	00:02:31	a	55.8	68.6	59.2	50.2	Closest to Fleet Road, unscreened.
10/09/2014 11:30	00:05:00	a	58.7	74.9	61.4	47.8	Max due to aircraft overhead.
10/09/2014 11:35	00:05:00	a	54.7	67.9	57.3	47	Closest to Fleet Road, unscreened.
10/09/2014 11:41	00:03:50	b	58.9	73.9	62.6	46.2	Facing Lawn Road @ 5m from carriageway.
10/09/2014 11:45	00:05:00	b	60.8	73.5	64.8	47.5	Facing Lawn Road @ 5m from carriageway.
10/09/2014 11:50	00:05:00	b	58.4	72.1	62	46.9	Facing Lawn Road @ 5m from carriageway.
10/09/2014 11:57	00:02:28	c	49.4	57.9	52	45.8	Facing Upper Park Road. Hoover noise from flat.
10/09/2014 12:00	00:05:00	c	48.3	56	51	44.4	Facing Upper Park Road. Max due to Lorry.
10/09/2014 12:05	00:01:50	c	47.1	54.8	48.7	44.5	Short sample as hoover came on again.

Appendix 3: Technical Summary for Mitigation – 32 Lawn Road.

Please refer to Figures 10 and 11 of the noise report when reading this technical note.

Glazing Requirements:

SRI - Octave Band Centre Frequency (Hz)	125	250	500	1k	2k	4k
Standard glazing:	21	17	25	35	36	31
Enhanced glazing:	26	27	33	39	39	40

A summary of requirements for glazing is shown below. Where an 'x' is placed, this denotes that the option is suitable for that specific façade or plot.

Façade / Plot (See Figures 10 & 11)	Standard Glazing	Enhanced Glazing
Daytime habitable rooms: (Ground to 4th Level)	-	x
All Bedrooms: (Ground to 4th Level)	x	-
All Habitable Rooms: (Ground to 6th Level)	x	-
No colour	x	-

Fairview's standard glazing specification is shown in the Table below:

SRI - Octave Band Centre Frequency (Hz)	125	250	500	1k	2k	4k
Standard glazing: 4/16/4mm	21	17	25	35	37	31

Other glazing configurations can be used as long as the octave band noise reduction above is achieved. The octave band frequency specification above must be provided to the supplier to enable an appropriate product to be selected.

Ventilation Requirements:

Some habitable rooms will require acoustic ventilation to reduce noise from road traffic. The following octave band reductions for vents are therefore required. Acoustic trickle vents or acoustic air bricks should be selected to meet the frequency reduction shown.

SRI - Octave Band Centre Frequency (Hz)	**125**	**250**	**500**	**1k**	**2k**	**4k**
Type A Trickle vents	28	30	32	31	29	30
Type B Acoustic Ventilation	36	35	35	38	42	42

The following table gives the requirements of ventilation required for each façade of the development. Where an 'x' is placed, this denotes that the option is suitable for that specific façade or plot.

Façade / Plot	**Type A**	**Type B**
	Trickle-vents	**Acoustic Ventilation**
All Habitable Rooms: (Ground to 4th Level)	-	x
All Daytime Habitable Rooms: (Ground to 6th Level)	-	x
All Bedrooms: (Ground to 6th Level)	x	-
No Colour	x	-

Fairview's standard ventilation specification is shown in the Table below:

SRI - Octave Band Centre Frequency (Hz)	**125**	**250**	**500**	**1k**	**2k**	**4k**
Type A: Titon XS13 vent + XC13 Canopy	35	35.3	36.4	34	29.3	32.7

Manufacturers / suppliers should be given the ventilation octave band specifications above to enable an appropriate product to be selected.

Fairview
NEW HOMES Ltd.