CAHILL DESIGN CONSULTANTS
FIRE ENGINEERING | ACOUSTIC DESIGN

39B Consort Road, Peckham, London, SE15 2PH.

Noise Assessment Report / Ventilation & Extraction

Client: T16 Limited

April 2019

Notice

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Document history

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1. Introduction & Overview

1.1. Cahill Design Consultants Limited (CDC) has been commissioned by T16 Limited, to provide acoustic advisory services to their residential project located at 39b Consort Crescent, Peckham, London SE15 2PH.

1.2. Specifically, CDC has been requested to provide a noise assessment for the development site relating to advice for the external building envelope with reference to glazing and ventilation strategy, inline with guidance provided in BS8233:2014 *'Guidance on sound insulation and reduction for buildings.'*

1.3. In addition, this report outlines the maximum noise levels from plant equipment that should be achieved at the nearest receivers, in accordance with BS4142:2014 and assumed planning conditions for the development.

1.4. An Acoustic Report has been provided for this assessment. This report was developed by others and outlines the existing noise and vibration environment in and around the development site. The results of these surveys provide the basis for the assessment undertaken within this report.

1.5. The proposed site is understood to be in an existing commercial area. The development proposals include the demolition and construction of a new build residential building and the redevelopment of an existing building to create commercial accommodation, within a stand alone building to the south west of the site.

1.6. The new build residential building is a ground plus three storey building (maximum). The residential building has two commercial units located to the east of the site.

1.7. The commercial building is a ground plus one storey building.

1.8. The site is bounded by elevated railway tracks to the north and the west. As a result of this the site is dominated by rail noise. In addition, the site is affected by road traffic noise from the localised roads located to the west, east and the south, including Consort Road and Nazareth Close.

1.9. The following figures illustrate the site location and proposed floor plan.

Figure 1: Approximate site location (in red)

1.10. The proposed ground floor plan is illustrated in the following figure.

Figure 2: Proposed first floor layout

1.11. It is understood that new building services plant will be installed onto both buildings and both buildings will be mechanically ventilated.

2. Planning Policy & Guidance

Noise Policy Statement for England, 2010 (NPSE)

2.1. The Noise Policy Statement for England (NPSE) applies to all forms of noise including environmental noise, neighbour noise and neighbourhood noise but does not apply to noise in the workplace. The Government recognises that the effective management of noise requires a co-ordinated and long term approach that encompasses many aspects of modern society.

2.2. The long term vision of Government noise policy is set out to promote good health and a good quality of life through the effective management of noise within the context of Government policy on sustainable development.

2.3. This long term vision is supported by three aims:

- 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.

2.4. The NPSE introduces the concept of NOEL, LOAEL and SOAELs, which are described below:

- NOEL – No Observed Effect Level – This is the level below which no observable effect can be detected.
- LOAEL – Lowest Observed Adverse Effect Level – This is the level above which adverse effects on health and quality of life can be detected.
- SOAEL – Significant Observed Adverse Effect Level - This is the level above which significant effects on health and quality of life can be detected.

Planning Policy Guidance – Noise, 2014

2.5. This guidance is provided online within the UK Government Planning System.

2.6. The guidance expands upon the concepts of Observed Effect Levels and the following table is provided.

Table 1 Planning Policy Guidance - Noise exposure hierarchy

Perception	Examples of Outcomes	Increasing Effect Level	Outcome
Not Noticeable	No Effect	No Observable Effect	No Specific Measured Required
Noticeable but not Intrusive	Noise can be heard, but does not cause any change in behaviour or attitude. Can slightly affect the acoustic character of the area, but not such that there is a perceived change in the quality of life.	No Observed Adverse Effect	No specific measures required.
		Lowest Observed Adverse Effect Level	
Noticeable and Intrusive	Noise can be heard and causes small changes in behaviour and/or attitude, eg turning up volume of television; speaking more loudly; where there is no alternative ventilation, having to close windows for some of the time because of the noise. Potential for some reported sleep disturbance. Affects the acoustic character of the area such that there is a perceived change in the quality of life.	Observed Adverse Effect	Mitigate and Reduce to a Minimum
		Significant Observed Adverse Effect Level	
Noticeable and disruptive	The noise causes a material change in behaviour and/or attitude, eg avoiding certain activities during periods of intrusion; where there is no alternative ventilation, having to keep windows closed most of the time because of the noise. Potential for sleep disturbance resulting in difficulty in getting to sleep,	Significant Observed Adverse Effect	Avoid

Perception	Examples of Outcomes	Increasing Effect Level	Outcome
	premature awakening and difficulty in getting back to sleep. Quality of life diminished due to change in acoustic character of the area.		
Noticeable and very disruptive	Extensive and regular changes in behaviour and/or an inability to mitigate effect of noise leading to psychological stress or physiological effects, eg regular sleep deprivation/awakening; loss of appetite, significant, medically definable harm, eg auditory and non-auditory	Unacceptable Adverse Effect	Prevent

2.7. With direct relevance to the proposed development and its impact on Thorpe Park, the guidance further states:

- *In cases where existing noise sensitive locations already experience high noise levels, a development that is expected to cause even a small increase in the overall noise level may result in a significant adverse effect occurring even though little to no change in behaviour would be likely to occur.*

- *If external amenity spaces are an intrinsic part of the overall design, the acoustic environment of those spaces should be considered so that they can be enjoyed as intended.*

- *The potential effect of a new residential development being located close to an existing business that gives rise to noise should be carefully considered. This is because existing noise levels from the business even if intermittent (for example, a live music venue) may be regarded as unacceptable by the new residents and subject to enforcement action. To help avoid such instances, appropriate mitigation should be considered, including optimising the sound insulation provided by the new development's building envelope. In the case of an established business, the policy set out in paragraph 182 of the Framework should be followed.*

National Planning Policy Framework, 2019 (NPPF)

2.8. The National Planning Policy Framework (NPPF) includes the following statements relating to noise and the requirement to take it into account in the planning process. The following statements are relevant to the development.

2.9. Section 15, paragraph 170 (e) of NPPF states:

- *preventing new and existing development from contributing to, being put at unacceptable risk from, or being adversely affected by, unacceptable levels of soil, air, water or noise pollution or land instability.*

2.10. Section 16, paragraph 180 of NPPF states

- (a) *mitigate and reduce to a minimum potential adverse impacts resulting from noise from new development – and avoid noise giving rise to significant adverse impacts on health and the quality of life.*
- (b) *identify and protect tranquil areas which have remained relatively undisturbed by noise and are prized for their recreational and amenity value for this reason;*

2.11. Paragraph 182 of NPPF further elaborates on the consideration of existing businesses, as follows:

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

2.12. The NPPF does not provide absolute limits on noise that are acceptable or unacceptable in a given situation. It does, however, set out the "*need to ensure that developments do not give rise to significant adverse impacts on health and the quality of life*". In addition, the operations of existing businesses are also protected, with reference to ensuring new developments do not have an adverse effect on their operations.

The Environmental Protection Act 1990

2.13. Under Part III of the Environmental Protection Act 1990 (EPA) as amended by the Noise and Statutory Nuisance Act 1993, local authorities have a duty to investigate noise complaints relating to a variety of sources, excluding road traffic noise. If the local authority is satisfied that the noise amounts to a statutory nuisance it will serve an Abatement Notice which may require that the noise be stopped altogether or limited to certain times.

2.14. Local Authorities have a duty to deal with statutory nuisances under the Environmental Protection Act 1990. For noise to amount to a statutory nuisance, it must be "prejudicial to health or a nuisance" - see section 79(1)(g) and (ga) of the 1990 Act. Councils must serve an abatement notice on people responsible for statutory nuisances, or on a premises owner or occupier if this is not possible. This may require whoever's responsible to stop the activity or limit it to certain times to avoid causing a nuisance and can include specific actions to reduce the problem.

2.15. For noise nuisances from premises, the notice can be delayed for up to 7 days while the council tries to get the person responsible to stop or restrict the noise.

2.16. A person served with a notice may appeal on a number of specified grounds, one of which applying to businesses is that the recipient was employing best practicable means (BPM) to reduce the noise when the notice was served:

- 'Practicable' means reasonably practicable, having regard among other things to local conditions and circumstances, to the current state of technical knowledge and to the financial implications;
- the means to be employed include the design, installation, maintenance and manner and periods of operation of plant and machinery, and the design, construction and maintenance of buildings and structures;
- the test is to apply only so far as compatible with any duty imposed by law;

- the test is to apply only so far as compatible with safety and safe working conditions, and with the exigencies of any emergency or unforeseeable circumstances.

- It may not apply where the noise is such to be a prejudice to health.

2.17. Section 82 of the EPA allows a "person aggrieved" to bring criminal proceedings in respect a statutory nuisance for a fine and abatement order. BPM is not a defence to the initial s.82 proceedings.

2.18. Whilst the EPA regime sits outside of the planning regime, it is material for the local planning authority to have regard to the potential for enforcement action to follow the grant of planning permission having regard to the requirements in national (NPPF) and local policy.

3. Acoustic Criteria & Standards

BS8233:2014 'Guidance on sound insulation and noise reduction for buildings'

3.1. This standard provides information and guidance on sound insulation and noise reduction for buildings. It deals with the control of external noise and outlines recommendations for occupied rooms.

3.2. The following table is taken from the document outlining requirements for internal noise levels in residential accommodation.

Table 2 Indoor Ambient Noise Levels for Dwellings (ref. BS8233:2014)

Activity	Location	07:00 to 23:00	23:00 to 07:00
Resting	Living Room	35dB $L_{Aeq,16Hr}$	-
Dining	Dining Room/Area	40dB $L_{Aeq,16Hr}$	-
Sleeping	Bedroom	35dB $L_{Aeq,16Hr}$	30dB $L_{Aeq,8Hr}$

3.3. The noise levels presented are based on existing WHO guideline values. The document further recommends that guideline value may be set in terms of SEL or $L_{Amax,F}$, depending on the character and number of events per night. In this instance and dB L_{Amax} level of 45 dB is recommended. Sporadic noise events could require separate values.

3.4. BS8233: 2014 states: "where development is considered necessary or desirable the internal target levels may be increased by up to 5dB and reasonable internal conditions still achieved. "

3.5. Regarding the use of open windows for background ventilation, BS 8233:2014 states 'if partially open windows were relied upon for background ventilation, the insulation would be reduced to approximately 15dB.'

3.6. Regarding outdoor amenity spaces, such as gardens and balconies, noise levels should not exceed 50 dB $L_{Aeq,T}$ with an upper limit of 55 dB $L_{Aeq,T}$. BS8233 recognises that these guideline values are not achievable in all circumstances where development may be desirable. This is also in line with WHO guidance.

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

3.7. BS 4142:1997 describes methods for determining and assessing noise levels from noise sources with a view to determining the likelihood of adverse impact.

3.8. The document has been developed for the purposes of:

- investigating complaints;
- assessing sound from proposed new, modified or additional sources of sound of an industrial and / or commercial nature; and
- assessing sound at proposed new dwellings or premises used for residential purposes.

3.9. The document is not suitable for the determination of noise nuisance. Furthermore, that standard is not intended to apply to the following sources of noise:

- recreational activities, including all forms of motorsport;
- music or other entertainment;
- shooting grounds;
- construction and demolition;
- domestic animals;
- people;
- public address systems for speech;
- other sources falling within the scopes of other standards or guidance.

3.10. The methodology requires the determination of the specific sound level, corrected for characteristic feature in order to produce a rating level. The rating level is then compared against the background noise level (expressed as $L_{A90,T}$), thereby producing an 'excess of Rating over background sound level' figure. This figure is then used for assessment of likelihood of adverse impact.

3.11. The standard places great emphasis on the context of the sound environment that is being assessed and the development overall. This is an essential part of the assessment process, particularly when predicting likelihood of adverse impact. However, for guidance the following is included in the standard:

- Typically, the greater the difference, the greater the magnitude of the impact;
- A difference of around +10 dB or more is likely to be an indication of a significant adverse impact, depending on the context;
- A difference of around +5 dB is likely to be an indication of an adverse impact, depending on the context;
- The lower the rating is relative to the measured background sound level, the less likely it is that the specific sound source will have an adverse impact or a significant adverse impact. When the rating level does not exceed the background sound level, this is an indication of the specific sound source having a low impact, depending on the context.

Approved Document E of the Building Regulations '*Resistance to the Passage of Sound*', 2010 Edition

3.12. Testing and rating of the sound insulation performance of the party walls have been made in accordance with the requirement outlined in the Building Regulations 2010, Approved Document E – Resistance to the passage of sound (2003 edition, amended 2004, 2010, 2013 and 2015). This came into force on the 1st July 2003 with amendments being introduced in subsequent years. This encompasses all relevant standards applicable to the party walls and floors having a separating function, in addition to reverberation treatment to common circulation spaces.

3.13. In the case of the Magdalen residential development, ADE outlines the requirements for '*Rooms for residential purposes formed by material change of use'.* These requirements have been outlined within this report.

3.14. ADE provides the following table, taken directly from the document, outlining the requirements for sound insulation to party walls and floors, for areas defined as *Rooms for residential purposes formed by material change of use'*

Table 3: Performance Standards of Approved Document E, 2010 (Table 0.1a in document)

Table 0.1a **Dwelling-houses and flats – performance standards for separating walls, separating floors, and stairs that have a separating function**

	Airborne sound insulation sound insulation $D_{nT,w} + C_{tr}$ dB (Minimum values)	Impact sound insulation $L'_{nT,w}$ dB (Maximum values)
Purpose built dwelling-houses and flats		
Walls	45	-
Floors and stairs	45	62

3.15. Similarly, ADE provides the following table, taken directly from the document, outlining the requirements for internal sound insulation.

Table 4: Performance Standards for Internal Walls and Floors within Rooms (Table 0.2 in document)

Table 0.2 **Laboratory values for new internal walls and floors within dwelling-houses, flats and rooms for residential purposes, whether purpose built or formed by material change of use**

	Airborne sound insulation R_w dB (Minimum values)
Walls	40
Floors	40

3.16. ADE also outlines the requirements for reverberation control within common areas of the building. These would include common corridors, hallways, stairwells, entrance halls.

3.17. The areas requiring acoustic treatment are defined within ADE as follows:

- "Corridors, hallways, stairwells and entrance halls, that give access to the flat or rooms for residential purposes"

3.18. ADE provides two methods for the control of reverberation in the above defined areas. These areas:

- **Method A** – Cover a specified area with an absorber of an appropriate class, that has been rated according to BS EN ISO 11654:1997 Acoustics. '*Sound absorbers in buildings. Rating of absorption'*.

- **Method B** – Determine the minimum amount of absorptive material using a calculation procedure in octave bands. Method B is only intended for corridors, hallways and entrance halls as it is not well suited to stairwells.

3.19. The above different methods are further defined within this report.

4. Noise Survey

4.1. Noise measurements were undertaken at the site by others. This included both noise measurements and vibration measurements.

4.2. For full details of the survey, please refer to report '*Environmental Noise & Vibration Assessment Report'* dated March 2017.

4.3. The results outlined within this survey report have been used for the assessment undertaken within this report.

4.4. The following table provides a summary of the range of noise survey results.

Table 5 Noise measurements results, by others, daytime and night time range

Measurement Period	$L_{Aeq, 15mins}$ dB	$L_{Amax, 15mins}$ dB	$L_{A90, 15mins}$ dB
Daytime (0700-2300)	55 – 63	69 – 87	43 -55
Night Time (2300-0700)	43 – 60	59 – 89	31 - 45

4.5. Based upon the above, the following table outlines a summary of the results, which are suitable for undertaking acoustic calculations, which form part of this assessment

Table 6 Octave band summary noise survey results, by others

Measurement period	63 Hz	125 Hz	250 Hz	500 Hz	1 kHz	2 kHz	4 kHz	8 kHz	dBA
Daytime (0700-2300) L_{Aeq} dB	62	60	58	57	55	52	47	45	60
Night Time (2300-0700) L_{Amax} dB	77	81	71	72	76	70	64	54	78
Night Time (2300-0700) L_{Aeq} dB	58	57	51	51	49	45	41	36	54

4.1. The vibration survey results are not presented here, as they demonstrated that the existing vibration levels are well below the threshold levels for impact as outlined. Full vibration results can be found in '*Environmental Noise & Vibration Assessment Report'* dated March 2017.

5. Noise Assessment

Building Envelope Acoustic Assessment

5.1. Calculations for external building envelope specification have been based upon octave spectrum data outlined within Section 4 of this report.

5.2. The following constructions should be able to provide suitable sound insulation to allow indoor ambient noise levels, in line with the requirements of BS8233:2014, to be achieved.

5.3. It is understood that the following constructions will be incorporated into the construction of the external facade of both the residential and commercial buildings.

Table 7 Assumed and proposed building envelope construction

Facade Element	Required Acoustic Performance (R_w)	Proposed Construction
Residential Building		
External Walls	>55 dB	• 100mm brickwork, • 200mm full fill insulation, • 100mm internal blockwork, • Wet plaster internally
Roof	>50 dB	Construction to be confirmed
External Glazing (Residential Units)	37 dB	10mm glazing / 12mm cavity / 6mm glazing
External Glazing (Commercial Units)	33 dB	6mm glazing / 12mm cavity / 6mm glazing
Commercial Building		
External Walls	>55 dB	• 100mm brickwork • 200mm full fill insulation • 100mm internal blockwork • Wet plaster internally
Roof	>50 dB	Construction to be confirmed
External Glazing	33 dB	6mm glazing / 12mm cavity / 6mm glazing

5.4. Alternative glazing configurations may also be considered, providing that they achieve the minimum R_w dB values outlined in the above table. Any alternative specifications shall be approved by a suitably qualified acoustic consultant prior to procurement.

5.5. Calculations indicate that the above constructions will achieve the following internal noise levels. For comparative purposes, the requirements of BS8233:2014 are also outlined.

Table 8 Calculated predicted indoor ambient noise levels

Room	Period	Predicted	Requirement	Comply / Non Comply
Residential Building				
Residential Units	Daytime	21 dB L_{Aeq}	35 dB L_{Aeq}	Comply
Residential Units	Night	38 dB L_{Amax}	45 dB L_{Amax}	Comply
Residential Units	Night	15 dB L_{Aeq}	30 dB L_{Aeq}	Comply
Commercial Units	Daytime	20 dB L_{Aeq}	40 L_{Aeq}	Comply
Commercial Building				
Commercial Unit	Daytime	20 dB L_{Aeq}	40 L_{Aeq}	Comply

5.6. The above calculation results indicate that all rooms within both the residential and the commercial buildings will comply with the requirements of BS8233:2014, with relation to internal ambient noise levels.

External Amenity Space

5.7. A number of private external amenity spaces are proposed for the development. These are located to both the front and rear elevations of the residential building.

5.8. BS8233:2014 and WHO guidance recommends daytime levels of 50-55 dBA for external amenity space, with 55 dBA being seen as the upper level. In this instance, external amenity space to the rear elevation are predicted to the within these levels. External amenity space to the front elevation of the development, may exceed these levels, however, they are predicted to be between 55-60 dBA.

5.9. Given the noise context of the site, this should be seen as acceptable. It is noted that the design has attempted to protect external amenity space from noise, as far as is practical.

6. Building Services Noise

6.1. Mechanical services noise from newly installed and exisitng plant items shall comply with the requirements of BS4142:2014. It is assumed that the local planning authority will also outline these requirements, within its planning conditions. This would apply to both existing and new build elements of the development.

6.2. At the time of writing, the specification for plant items was not confirmed. Therefore, this report outlines the maximum noise levels that should be achieved at 1m from the nearest facades of noise sensitive receivers, to the development. In this instance these are residential receivers on Nazareth Close, directly to the south of the proposed development.

6.3. Although not confirmed at the time of writing, it is assumed that the following requirements would apply:

- Noise levels from fixed mechanical plant items shall be assessed and controlled to achieve a noise level that is a minimum of 10 dB below pre development background noise levels (expressed as L_{A90} dB). If tonal elements are present within the plant noise spectrum, a further 5 dB tonal correction shall be applied, in accordance with BS4142:2014.

6.4. The following table outlines the maximum noise levels from plant items that should not be exceeded at the nearest receivers. The levels will apply cumulatively, with all plant operating simultaneously, for both the residential building and the commercial building. Levels shall be achieved at 1m from the nearest facades of the defined noise sensitive receiver (NSRs).

Table 9 Maximum noise levels for fixed plant items, at noise sensitive receivers

Location	$L_{A90,15mins}$ dB
36-42 Nazareth Close, directly to the south of the site	28 dB

6.5. Further calculations will be undertaken as the building services design develops to ensure that the above is achieved. However, at this stage the design presents no constraints to the required levels being achieved , with the introduction of standard noise mitigation elements, such as sound attenuators and anti-vibration mounts.

7. Conclusions

7.1. This report outlines the findings of a noise assessment, undertaken to support the planning submission for 39b Consort Road, Peckham, London.

7.2. This report references noise survey data, undertaken by others, in order to undertake the required assessment calculations.

7.3. Calculations indicate that internal ambient noise levels, in accordance with BS8233:2014, can be achieved with the constructions outlined within the report. This would include main structural facade elements and external glazing. It is understood that both the residential and commercial buildings will be mechanically ventilated.

7.4. The requirements for maximum noise emissions from fixed mechanical plant are also outlined, in accordance with BS4142.

7.5. The assessment undertaken within this report, demonstrates that there are no constraints to the requirements of planning being achieved, as they relate to noise, providing that the recommendations outlined within this report are implemented into the construction of the development.