

## 6 Noise and vibration

### KEY MESSAGES:

- The Council will assess the impact of noise and vibration through the consideration of acoustic reports submitted by applicants.
- Noise mitigation (where appropriate) is expected to be incorporated into developments at the design stage.
- The Council will secure mitigation measures through planning condition or legal agreement where necessary.
- The Council will adopt the 'agent of change' principle.

6.1 Noise and vibration can have a significant impact on amenity, quality of life and wellbeing. This section provides guidance regarding the application of Local Plan Policies A4 Noise and vibration and A1 Managing the impact of development, which seek to protect residents of both existing and new residential developments and the occupiers of other noise-sensitive developments from the adverse effects of noise and vibration. Appendix 3 of the Local Plan supports these policies and sets out expected standard in terms of noise and vibration.

6.2 This chapter contains guidance on the following:

- Assessing the impact of noise and vibration
- Acoustic reports
- Internal noise levels and vibration
- Plant and other noise generating equipment
- Food, drink, entertainment and leisure noise
- Delivery management.

### Assessing the impact of noise and vibration.

6.3 The Council will assess the impact of noise and vibration through acoustic reports submitted by applicants.

### When should acoustic reports be prepared?

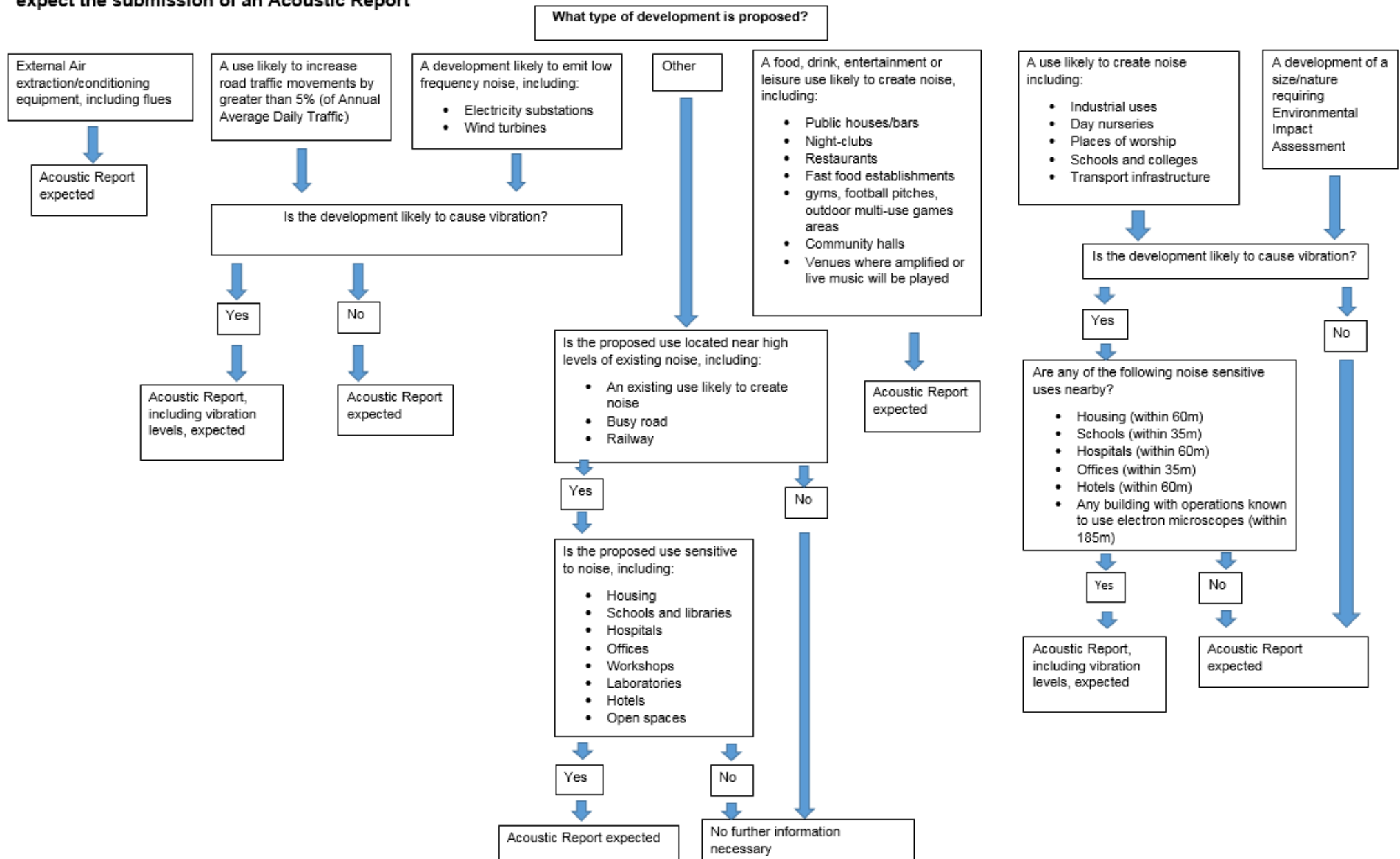
6.4 When a planning application is submitted, an acoustic report should accompany the application where any of the following are proposed:

- plant, ventilation, air extraction or conditioning equipment and flues;
- uses likely to create significant noise such as food/drink/entertainment and leisure uses, industrial uses, day nurseries, places of worship, schools and colleges;
- a noise-sensitive use located in noisy environment (e.g. near to a busy road, railway line, noisy industry)
  - noise sensitive uses include housing, schools/libraries, hospitals, offices, workshops, laboratories, hotels and open spaces.
  - a noisy environment is considered to be an area where non-standard adaptations have to be made to a development in order to prevent harmful or otherwise unwanted effects, such as annoyance or sleep disturbance.

- uses likely to generate a significant amount of traffic (defined as road traffic movements greater than 5% of Annual Average Daily Traffic); and
- developments emitting low frequency noise (e.g. electricity substation).

- 6.5 Diagram 1 below summarises the instances of where an acoustic report is expected and where the report should also consider vibration impacts.
- 6.6 After planning permission is granted, an additional acoustic report should also be submitted to consider the noise impacts of the construction stage as part of Construction Management Plans (CMPs). Please see Camden Planning Guidance relating to CMPs and information on the Council's [website](#) for further information.
- 6.7 Development of a size and/or nature requiring Environmental Impact Assessment (EIA) should also submit an acoustic report.

**Diagram 1: Flow chart showing when the Council will expect the submission of an Acoustic Report**



## Noise and vibration thresholds

6.8 When assessing acoustic reports, the Council will consider the reported measurements against the noise thresholds set out in Appendix 3 of the Local Plan. The thresholds are expressed as 'effect levels', which sets out a hierarchy of expected changes in behaviour and impact on health and wellbeing in response to increasing noise levels (measured in decibels - dB). The 'effect levels' are summarised below and explained in detail in [National Planning Practice Guidance \(NPPG\)](#). The table detailing each 'effect level' from NPPG is also set out in Appendix 1 to this guidance for ease of reference.

- No observed effect level (NOEL) – the level below which no effect can be detected on health and quality of life.
- Lowest observable adverse effect level (LOAEL) – the level above which changes in behaviour (e.g. closing windows for periods of the day) and adverse effects on health (e.g. sleep disturbance) and quality of life can be detected.
- Significant observed adverse effect level (SOAEL) – the level above which adverse effects on health and quality of life occur. This could include psychological stress, regular sleep deprivation and loss of appetite.

6.9 Where appropriate, the Council will also consider the cumulative impact of numerous individual noise sources where noise is known to be an issue. Camden's town centres for example are known to have a proliferation of air conditioning machinery and contain numerous food, drink, leisure and entertainment uses which all contribute to creating noisy environments.

## Mitigating noise impacts

6.10 The implications of noise and vibration should be considered at the beginning of the design process so that the impacts of noise and vibration can be minimised. Examples of design features which could reduce noise impacts include (but are not limited to):

- locating noise sensitive areas/rooms away from the parts of the site most exposed to noises;
- creating setbacks;
- designing a building so its shape and orientation reflect noise and protect the most sensitive uses;
- stacking similar rooms (such as kitchens and living rooms) above each other;
- positioning non-residential uses closer to the noise source in mixed use developments;
- insulating and soundproofing doors, walls, windows, floors and ceilings;
- sealing air gaps around windows;
- double glazing;
- including architectural fins (where appropriate);
- laminated glass;
- anti-vibration foundations;
- noise barriers such as landscaping, fencing and solid balconies to reflect sound; and
- incorporating 'sound proof' construction/cladding materials.

6.11 In instances where noise mitigation is necessary, proposals will be expected to include appropriate attenuation to alleviate or mitigate the impact of noise and

vibrations to an acceptable level. Where noise mitigation has not been proposed adequately, but is considered necessary, the Council will consider the use of planning conditions or a legal agreement. Guidance regarding mitigation can be found within *BS8233:2014 Guidance on sound insulation and noise reduction for buildings*.

6.12 Examples of mitigation include:

- reducing the noise emitted at its point of generation (e.g. by using quiet machines and/or quiet methods of working);
- containing the noise generating equipment (e.g. by insulating buildings which house machinery and/or providing purpose-built barriers around the site);
- protecting any surrounding noise-sensitive buildings (e.g. by improving sound insulation in these buildings and/or screening them by purpose-built barriers);
- ensuring an adequate distance between source and noise-sensitive buildings or areas;
- screening by natural barriers, buildings, or non-critical rooms in the development.
- limiting the operating time of the source;
- restricting activities allowed on the site;
- specifying an acceptable noise limit;
- restricting window openings;
- sound proofing internal and external walls; and
- using cladding specifically designed for sound reduction.

**Agent of change principle**

6.13 In order so existing businesses do not have unreasonable restrictions put onto them because of changes in nearby land uses, the Council will apply the ‘agent of change’ principle. The ‘agent of change’ principle identifies the person or business responsible for the change is also responsible for managing the impact of the change.

6.14 Noise sensitive uses proposed near to existing uses/businesses likely to create significant noise should therefore include necessary features to mitigate the anticipated noise and vibration effects of the existing use/business nearby.

**Acoustic reports**

6.15 Camden’s noise and vibration thresholds in Appendix 3 of the Local Plan provide the starting point for developing acoustic reports relating to:

- vibration;
- developments likely to be sensitive to noise;
- industrial and commercial noise; and
- entertainment noise.

6.16 Developers should also seek guidance from the Council’s Noise team prior to any acoustic work being carried out in order so they can advise on the best methodology for the proposed development and any bespoke reporting for developments that may fall outside of the above categories.

The Camden Council Noise team can be contacted at [RegulatoryServices@camden.gov.uk](mailto:RegulatoryServices@camden.gov.uk)

6.17 Assessments should be carried out and produced by a suitably qualified and competent consultant and conform to the standards in *BS7445 1-3:2003 Description and measurement of environmental noise* (or any later replacement guidance).

- 6.18 As assessment and guidance for noise and vibration control is always evolving, applicants must ensure that they consider amendments or updates to existing noise guidance. Where there is uncertainty, they should contact the Council's Noise team for clarification.
- 6.19 The appropriate amount and detail of information required will depend on the specific circumstances of a proposal. Details and information forming the minimum requirements for specific types of development can be provided by the Council's Noise team.
- 6.20 The minimum below information is expected to be submitted as part of an acoustic report:
- description of the proposal;
  - description of the site and surroundings, a site map showing noise and vibration sources and measurement locations;
  - background noise levels measured over a minimum of 24 hours;
  - details of instruments and methodology used for noise measurements (including reasons for settings and descriptors used, calibration details);
  - details of the plant or other source of noise and vibration both on plan and elevations and manufacturers specifications;
  - noise or vibration output from proposed plant or other source of noise and vibration, including:
    - noise or vibration levels;
    - frequency of the output; and
    - length of time of the output.
  - features of the noise or vibration e.g. impulses, distinguishable continuous tone, irregular bursts;
  - specification of the plant, supporting structure, fixtures and finishes;
  - location of noise sensitive uses and neighbouring windows;
  - details of measures to mitigate noise and vibration;
  - details of any associated work including acoustic enclosures and/or screening;
  - cumulative noise levels; and;
  - hours/days of operation.
- 6.21 In order to demonstrate all the above has been submitted, a copy of the Council's acoustic report [Checklist](#) should also be submitted along with the report.

## Internal noise levels and vibration

### Internal noise levels

- 6.22 The requirements of the Building Regulations are usually adequate for the sound insulation between floors and walls of adjoining dwellings, making planning conditions unnecessary.
- 6.23 The requirements of the Building Regulations are however likely to be inadequate in instances where:
- a new commercial use likely to generate noise adjoins an existing residential building (and vice versa); and/or
  - a change of use will result in a residential development being sited in a noisy environment.

- 6.24 Where such development is proposed, the Council is likely to use planning conditions requiring substantially enhanced sound insulation of relevant walls, floors and ceilings compared to the minimum specifications of the Building Regulations. In proposing conditions, the Council will consider guidance available within *BS8233:2014 Guidance on sound insulation and noise reduction for buildings*, [Guidelines for Community Noise \(1999\)](#) and [Night Noise Guidelines for Europe \(2009\)](#) published by the World Health Organisation.

### **Vibration**

- 6.25 Vibrations transmitted through the structure of a building can be detected by its occupants and can result in adverse effects. Depending on the timing and the nature of the vibration, occupants may have disturbed sleep or struggle to work efficiently. Vibration at higher magnitudes can even act to damage a building over time.
- 6.26 When assessing the impact of vibration, the Council will expect the vibration thresholds within Camden Local Plan Appendix 3 not be exceeded and consider guidance from *B6472-1:2008 'Guide to evaluation of human exposure to vibration in buildings Part 1: Vibration sources other than blasting'*.

### **Plant and other noise generating equipment**

- 6.27 Developments proposing plant, ventilation, air extraction or conditioning equipment and flues will need to provide the system's technical specifications to the Council accompanying any acoustic report. '*BS4142 Method for rating Industrial and Commercial Sound*' contains guidance and standards which should also be considered within the acoustic report.
- 6.28 There are however likely to be instances where the Council will consider that a BS4142 assessment alone is not sufficient to provide all the information necessary. Plant such as electrical substations for example, may meet BS4142 standards, but are also known to emit low frequency noise, which also needs to be considered. Developers are therefore encouraged to discuss proposals of this nature with the Council's Noise team before preparing their acoustic report - Email: [RegulatoryServices@camden.gov.uk](mailto:RegulatoryServices@camden.gov.uk).
- 6.29 Plant, ventilation, air extraction or conditioning equipment and flues can cause disturbance to residential properties. The Council would therefore welcome the use of long-term maintenance agreements to ensure that equipment maintains acceptable noise levels over its lifetime and the use of timers to limit any unnecessary operation of the equipment.

### **Food, drink, entertainment and leisure noise**

- 6.30 Food, drink, entertainment and leisure uses can pose particular difficulties in terms of noise and disturbance, as their peak operating time is usually in the evening and late at night.
- 6.31 Where such uses are proposed, access routes, outdoor standing/seating areas, smoking areas, pub gardens, etc. should be sited away from noise sensitive facades and/or effectively screened.
- 6.32 The Council expects the noise impacts of these uses to be considered within an acoustic report. Assessments of noise from entertainment and leisure premises must include consideration of amplified and unamplified music, human voices, footfall, vehicle movements and other general activity. Developers should contact the Council's Noise team to discuss the most appropriate methodologies to undertake the assessment.

6.33 Principally, in order to manage food, drink, entertainment and leisure noise, the Council will consider the use of planning conditions to control aspects such as (but not limited to):

- opening times;
- amplified music (e.g. times when music can be played and maximum volumes); and
- restrictions on times where outdoor standing/seating areas can be used.

6.34 In line with Local Plan policies TC4 and C5, the Council will also consider the use of management plans secured through a section 106 legal agreement, which may include elements principally seeking to manage noise off-site. Examples could include:

- staff training;
- positioning queues away from residential buildings; and
- ensuring that bottles and cans are not disposed of in outdoor bins areas late at night.

In order for existing businesses to continue operating without restriction, in instances where a noise sensitive use is proposed near to an existing food, drink, entertainment or leisure venue known to generate noise and vibration, the Council will apply the 'agent of change' principle (referred to in Section 1). Within Camden, this will often mean that residential development will be expected to include sufficient insulation to mitigate the anticipated noise and vibration effects of a nearby food, drink, entertainment or leisure venue.

### **Delivery management**

6.35 Deliveries and collections can cause disruption to nearby residential properties. When preparing Delivery and Servicing Management Plans, in order to reduce noise impacts regard should be given to the following:

- [Noise Abatement Society's Silent Approach Quiet Night Time Delivery Scheme](#);
- Guidance published by [Transport for London](#) regarding retiming and consolidating deliveries;
- [Freight Transport Association Guidance Delivering the Goods – a toolkit for improving night-time deliveries](#); and
- Camden Local Plan Policy T4 Sustainable movement of goods and materials and associated Camden Planning Guidance to reduce the number of overall deliveries.

6.36 The Council expects that deliveries and refuse collections to be carried out between 08:00-20:00hrs. Developments requiring deliveries outside of these times should provide an acoustic report to demonstrate there will be no adverse impact in relation to noise, with particular reference to residential occupiers as a result of these activities. When preparing the assessment, regard should be given to *BS4142 Method for rating and assessing industrial and commercial sound*. Developers are however encouraged to discuss their proposals with the Council's Noise team before conducting their acoustic report. (Email: [RegulatoryServices@camden.gov.uk](mailto:RegulatoryServices@camden.gov.uk).)



## 7 Wind and micro-climate

### KEY MESSAGES:

- New developments should consider the local wind environment, local temperature, overshadowing and glare, both on and off the site.
- Buildings taller than their surroundings may cause excessive wind in neighbouring streets and public areas.
- Where poor wind conditions already exist reasonable attempts must be made to improve conditions.

- 7.1 The purpose of this guidance is to ensure that appropriate standards are met in the design of buildings and outdoor features to ensure that suitable safety and comfort levels are achieved in terms of wind and microclimate. It relates to Camden Local Plan Policy A1 Managing the impact of development and Policy D1 Design in relation to tall buildings (paras 7.35-7.38).
- 7.2 London Plan policy 7.6 Architecture seeks to ensure that buildings and structures do not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and microclimate. Furthermore, London Plan policy on tall and large buildings (policy 7.7) states that tall buildings, among other things, should not affect their surroundings adversely in terms of microclimate and wind turbulence.
- 7.3 This chapter contains guidance on the following:
- When wind and microclimate should be considered
  - Wind
  - Other influences on microclimate

### When wind and microclimate should be considered

- 7.4 This guidance applies to all development that has the potential to change its environment with regard to wind and micro-climate, including extensions (see box below). However, the implications for a proposal will vary greatly depending on the nature of the site, the scale of development, its interaction with surrounding sites, and existing buildings and structures on the site.
- 7.5 The construction of a building changes the microclimate in its vicinity. Micro-climate refers to local conditions including wind, temperature, overshadowing, access to daylight and general comfort. In particular high-rise buildings can cause high wind velocities at pedestrian level which can create an uncomfortable environment and can even be dangerous. Therefore, the design of a building should not only focus on the building envelope and on providing good indoor environment, but should also consider the effect on the surrounding outdoor environment.

- 7.6 Developments with potential to change their local environment include:
- New or modified tall buildings or buildings significantly higher than any surrounding building;
  - Significant modifications to the built environment in areas of quantifiable and recognised existing wind nuisance;
  - Major proposals adjacent to or incorporating a significant area of public or outdoor space;
  - Developments with a large amount of glazing or dark masonry surfaces; or
  - A combination of new or modified buildings that cumulatively, will significantly change the wind environment.

### **Wind**

- 7.7 Buildings taller than their surroundings may cause excessive wind in neighbouring streets and public areas. Environmental winds are primarily driven by building massing and should be considered at the early design stages, when changes to achieve design objectives can be made most easily.
- 7.8 The Council will expect applicants to consider the local wind environment, both on and off the site, when designing schemes. Where poor wind conditions exist in an area prior to development, a reasonable attempt must also be made to improve conditions in general.

### **What information should be provided on wind?**

- 7.9 The Council expects relevant developments to use the established Lawson Comfort Level Ratings. The Lawson Criteria are used throughout the UK to assess local wind environments and are a widely accepted assessment tool.

#### **The Lawson Comfort Criteria**

The Lawson Comfort Criteria is a scale for assessing the suitability of wind conditions in the urban environment based upon threshold values of wind speed and frequency of occurrence.

It sets out a range of pedestrian activities from sitting through to crossing the road and for each activity defines a wind speed and frequency of occurrence (see Figure 1 below).

If the wind conditions exceed the threshold then the conditions are unacceptable for the stated activity.

**Figure 1 - Lawson Comfort Level Rating**

Lawson Comfort Level Rating	Predominant activity	Mean hourly wind speed exceeded less than 5% of the time
C4 - Long term "Sitting"	Reading a newspaper and eating and drinking	4m/s
C3 - "Standing" or short term sitting	Appropriate for bus stops, window shopping and building entrances	6m/s
C2 - Pedestrian Walking or "Strolling"	General areas of walking and sightseeing	8m/s
C1 - Business "Walking"	Local areas around tall buildings where people are not expected to linger	10m/s

7.10 For relevant developments, planning applications should be accompanied by qualitative wind impact statement, prepared by a suitably qualified professional (i.e. wind engineer or similar).

7.11 You must firstly carry out a qualitative wind impact assessment. If the results of this show potential negative impacts you will also need to carry out a quantitative assessment. Both assessments must be submitted with the planning application. The assessment must provide detailed information on how the proposal meets this guidance, using quantitative measures (i.e. evidence of wind tunnel testing or similar).

**A Wind Impact Statement must:**

- Show how the proposal is expected to affect the local wind environment;
- Describe how the proposal has addressed the local wind environment;
- Include reference to specific features of the site or the development that make a contribution to the wind environment, either positively or negatively, and highlight areas of concern; and
- Reference the proposal's ability to meet the targets of this guidance, and make recommendations regarding the necessity for additional work, as described below.

**A Wind Impact Statement should:**

- Compare existing and proposed conditions against the Lawson Comfort Criteria in both summer and winter conditions;
- Demonstrate how the proposal has adapted to the local wind environment;
- Reference specific features of the site or the development that make a contribution to the wind environment, both positively or negatively;
- Highlight areas of concern, and
- Describe the proposal's ability to adhere to the guidance.

Impact on the following areas must be considered where relevant:

- public and private open spaces on and adjacent to the site;
- outdoor areas on upper levels of the development;
- entrance and exit areas;

- shop windows;
- bus stops;
- outdoor dining areas;
- thoroughfares; and
- pedestrian crossing points.

- 7.12 If a proposal does not achieve the targeted ratings or outcomes applicants must provide sound justification to demonstrate, to the satisfaction of the Council, why their proposal cannot meet the targets. This justification should be prepared in conjunction with, and endorsed by a wind engineer, and must include evidence of the attempts that have been made to address design deficiencies.
- 7.13 If a proposal does not satisfactorily meet the criteria, and satisfactory justification is not provided, the proposal may be refused.
- 7.14 The Council may attach conditions to secure the achievement of wind speeds around a building no greater than those predicted. The Council may require alterations or other remedial measures at the developer's expense if wind speed targets are not met.

### **Other considerations relating to the wind environment**

- 7.15 Development must not compromise the viability of wind-driven renewable energy generators on adjacent and nearby sites. Where wind-driven energy generators are likely to be significantly affected, applicants are responsible for mitigating the loss by moving, modifying or replacing the installation, or by incorporating equivalent renewable energy generation within the application site.
- 7.16 Where a development affects the viability of an existing wind-driven renewable energy generator, and the solution is to modify the installation off-site, all approvals, expenses and risks are the responsibility of the applicant. This requirement will be incorporated as a condition or in a S106 agreement relating to any approval. Where additional renewable energy capacity is to be installed on site, this will be assessed in conjunction with other renewable energy installations. (Note: additional capacity that is gained by installations off-site should be credited toward the onsite requirement for the development)
- 7.17 Wind environment also impacts on natural ventilation systems. Therefore, natural ventilation must also be considered in building design.

### **Other influences on micro-climate**

#### **Local heat**

- 7.18 Local air temperature can be affected by a building's ability to absorb heat during the day and release it at night. This cumulative effect of this happening across London results in the urban heat island effect. The Council strongly encourages green roofs, brown roofs, green walls and soft landscaping in all developments to reduce this effect. Applicants can also consider light coloured building materials so unnecessary heat is not absorbed by a proposed building. See Camden Planning Guidance on sustainability for further guidance on these issues.

#### **Overshadowing**

- 7.19 You should consider the design of your proposal carefully so that it does not block sunlight and overshadow windows or open spaces and gardens. It will be particularly important in Central London and other densely developed part of the borough to prevent overshadowing of amenity space and open spaces given the limited amount of open

spaces and the existing amount of overshadowing. Further detail can be found in the daylight and sunlight chapter of this Guidance.

### **Glare**

- 7.20 Glare is uncomfortably bright sunlight reflected from a building façade. It is generally caused by tall, fully glazed and sloping facades with reflective finishes that reflect the sun. Tall buildings should be designed to avoid this and use materials that do not result in glare. See Artificial Light section of this Guidance for further details.