

Air Quality Assessment

Mr David Tippetts

FOR THE SITE AT:
166 Leatherhead Road
Chessington
KT9 2HU

Royal Borough of Kingston upon Thames



Version	Revision	Date	Author	Reviewer	Project Manager
1	A	01.03.2024	Jiale Li	Grace Boatfield	Alaister Coffey

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SRE Registered Office | London Square

3 London Square | Guildford

Cross Lanes | Guildford | GU1 1UJ

01730 710044

info@sre.co.uk

www.sre.co.uk

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Executive Summary

An Air Quality Assessment (AQA) has been produced by SRE Ltd. for the Proposed Development at 166 Leatherhead Road in Chessington, London on behalf of Mr David Tippetts (the Client).

The Proposed Development is located within the Kingston upon Thames Air Quality Management Area (AQMA), which was declared by the Royal Borough of Kingston upon Thames in 2003 due to exceedances in Nitrogen dioxide (NO₂) and Particulate Matter (PM₁₀). The development therefore aims to mitigate the risks of any air pollution to future building users.

The AQA report aligns with GLA planning policy requirement by addressing Air Quality Neutral (AQN). Following the 'Air quality Neutral London Plan Guidance (February 2023)', the Building Emissions Benchmark (BEB) and Transport Emissions Benchmark (TEB) are assessed separately for the Proposed Development and the criteria are met for the Proposed Development to be Air Quality Neutral.

Following the assessment, construction phase and operational phase impacts on the air quality are considered and key mitigation measures are addressed related to the increase traffic, odour, and aerosols from the proposed scheme. The proposed energy strategy does not incorporate gas-fired or solid-/oil-fuelled heating systems and therefore there are no associated Nitrogen Oxides (NO_x) emissions during the operation of the building. The encouragement of Electric Vehicle (EV) charging points and cycle storage also promote sustainable transport to and from the site.

The AQA report tackles both external and internal pollution concerns, offering essential mitigation measures to enhance the indoor air quality of the Proposed Development. By integrating appropriate mitigation measures during the development's design and construction phase, the potential health hazards for future site and building users can be minimised. Adhering to the suggestions in this AQA report could reduce the potential future impact of the Proposed Development on local air quality.

1.0 Introduction

As stated by the World Health Organisation (WHO), air pollution ‘defines the contamination of indoor or outdoor areas by biological, chemical, or physical particles that modify the natural characteristics of the atmosphere.’

Depending on the level of exposure, this pollution can provoke a wide range of health effects with the most dangerous forms of air pollution being Particulate Matter (PM_{2.5}/PM₁₀) and Nitrogen Oxides (NO₂/NO_x) due to their high concentration. In the UK, power generators and transport are the largest human-made sources of PM with Nitrogen Oxides also representing a human-made pollutant released through combustion processes such as heating, power generation and vehicle/ship engines¹.

This Air Quality Assessment (AQA) has been written by SRE Ltd. on behalf of Mr David Tippetts (The Client) in order to address the Royal Borough of Kingston upon Thames and the Greater London Authority (GLA) planning policy requirements for the new proposed scheme at 166 Leatherhead Road, Chessington (the Proposed Development).



Figure 1 - Location of the Proposed Development (Google Earth)

The application site currently comprises two semi-detached houses situated on Leatherhead Road (A243) in the southern part of Chessington. Leatherhead Road is a partially primary status A-road that runs from Leatherhead in Surrey to Surbiton in the Royal Borough of Kingston Upon Thames. It is governed by a 30mph

¹ Demystifying Air Pollution in London: Full Report, January 2018.

speed limit and features footways on both sides as well as cycle lanes. The site's accessibility is boosted by several nearby bus stops, while Chessington South Station, located just 300 meters away or a 6-minute walk on the east side of the proposed development, further enhances transportation options.

The Proposed Development is located within the local residential community but also boasts the advantage of being in very close proximity to employment opportunities, various recreational parks, and vast green spaces. Bound by Leatherhead Road to the east, the Proposed Development finds itself amidst the sprawling residential buildings of Chessington to the west. Surrounding the development to the east and south are expansive green spaces, including Chessington World of Adventures, situated just 600 meters away. These green areas offer access to outdoor activities and sports, enriching the site's environment.

The Proposed Development of the site consists of the proposed demolition of the existing two dwellings and construction of seven houses (six two-storey terrace houses with lofts and one bungalow) with associated access, parking, cycle and refuse storage (Figure 2).



Figure 2 - Site plan of the Proposed Development (Matthew Allchurch Architects)

1.1 National Air Quality Objectives

There is growing evidence that air pollution, even when experienced at very low levels, is damaging to human health. Table 1 below represents the current national air quality objectives and targets for the protection of human health from the national DEFRA Air Quality Limits².

Pollutant	Applies	Objective	Concentration measured as	Date to be achieved by (and maintained thereafter)
Particles (PM ₁₀)	UK	50 µg/m ³ not to be exceeded more than 35 times a year	24 hours mean	31 December 2004
	UK	40 µg/m ³	annual mean	31 December 2004
Particles (PM _{2.5}) Exposure Reduction	UK (except Scotland)	20 µg/m ³	annual mean	1 January 2020
	UK urban areas	Target of 15% reduction in concentrations at urban background		Between 2010 and 2020
Particles (PM _{2.5}) (Population Exposure Reduction Target)	England	Target of 35% reduction in population exposure compared with the average population exposure baseline period (2016 – 2018)	population exposure reduction	31 December 2040
Particles (PM _{2.5}) (Annual Mean Concentration Target)	England	10 µg/m ³ not to be exceeded at any relevant monitoring station	annual mean	31 December 2040
Nitrogen dioxide	UK	200 µg/m ³ not to be exceeded more than 18 times a year	1 hour mean	31 December 2005
	UK	40 µg/m ³	annual mean	31 December 2005

Table 1 - National Air Quality Objectives and Targets for the protection of human health

1.2 Planning Context

This AQA addresses the GLA planning policy requirement, as per the ‘Air quality Neutral London Plan Guidance (February 2023)³’ concerning general air quality issues around the proposed site. London Plan⁴ Policy SI 1 Improving Air Quality requires that “Development Plans, through relevant strategic, site-specific and area-based policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the mayor’s or boroughs’ activities to improve air quality”. The Royal Borough of Kingston upon Thames Air Quality Action Plan⁵ covers the actions that the Council intent to take in order to improve air quality in the Royal Borough of Kingston upon Thames over a five-year period.

² DEFRA National Air Quality and European Directive Limit and Target Values for the Protection of Human Health

³ Air quality Neutral London Plan Guidance (February 2023)

⁴ The London Plan Guidance (March 2021)

⁵ Royal Borough of Kingston upon Thames Air Quality Action Plan 2021 - 2026

Table 2 below summarises the policy context of the relevant policy.

Planning Policy	Sections	Policy Summary
<p>Air quality Neutral London Plan Guidance (February 2023)</p>	<p>Air Quality Neutral</p>	<p>An Air Quality Neutral development is one that meets, or improves upon, the Air Quality Neutral benchmarks set out in this document. These benchmarks set out the maximum allowable emissions of NO_x and particulate matter based on the size and use class of the proposed development. These benchmarks are based on research and evidence carried out by building and transport consultants and are designed to prevent the degradation of air quality from the combined emissions of individual developments.</p> <p>There are two sets of benchmarks, which cover the two main sources of air pollution from new developments:</p> <ul style="list-style-type: none"> • Building Emissions Benchmark (BEB) – emissions from equipment used to supply heat and energy to the buildings • Transport Emissions Benchmark (TEB) – emissions from private vehicles travelling to and from the development.
<p>The London Plan (March 2021)</p>	<p>Policy SI 1 Improving air quality</p>	<p>A: Development Plans, through relevant strategic, site-specific and areabased policies, should seek opportunities to identify and deliver further improvements to air quality and should not reduce air quality benefits that result from the Mayor’s or boroughs’ activities to improve air quality.</p> <p>B: To tackle poor air quality, protect health and meet legal obligations the following criteria should be addressed:</p> <p>1) Development proposals should not:</p> <ul style="list-style-type: none"> a) lead to further deterioration of existing poor air quality. b) create any new areas that exceed air quality limits or delay the date at which compliance will be achieved in areas that are currently in exceedance of legal limits. c) create unacceptable risk of high levels of exposure to poor air quality. <p>2) In order to meet the requirements in Part 1, as a minimum:</p> <ul style="list-style-type: none"> a) development proposals must be at least Air Quality Neutral. b) development proposals should use design solutions to prevent or minimise increased exposure to existing air pollution and make provision to address local problems of air quality in preference to post-design or retrofitted mitigation measures. c) major development proposals must be submitted with an Air Quality Assessment. d) development proposals in Air Quality Focus Areas or that are likely to be used by large numbers of people particularly vulnerable to poor air quality, such as children or older people should demonstrate that design measures have been used to minimise exposure. <p>C: Masterplans and development briefs for large-scale development proposals subject to an Environmental Impact Assessment should consider how local air quality can be improved across the area of the proposal as part of an air quality positive approach. To achieve this a statement should be submitted demonstrating:</p> <ul style="list-style-type: none"> 1) how proposals have considered ways to maximise benefits to local air quality, and 2) what measures or design features will be put in place to reduce exposure to pollution, and how they will achieve this. <p>D: In order to reduce the impact on air quality during the construction and demolition phase development proposals must demonstrate how they plan to comply with the Non-Road Mobile Machinery Low Emission Zone and reduce emissions from the demolition and construction of buildings following best practice guidance (section 5.2).</p>

	<p>E: Development proposals should ensure that where emissions need to be reduced to meet the requirements of Air Quality Neutral or to make the impact of development on local air quality acceptable, this is done on-site. Where it can be demonstrated that emissions cannot be further reduced by on-site measures, off-site measures to improve local air quality may be acceptable, provided that equivalent air quality benefits can be demonstrated within the area affected by the development.</p>
<p>Royal Borough of Kingston upon Thames - Air Quality Action Plan 2021 - 2026</p>	<p>The Royal Borough of Kingston upon Thames is committed to reducing the exposure of people in Kingston to poor air quality in order to improve health.</p> <p>They have developed actions that can be considered under seven broad topics:</p> <ol style="list-style-type: none"> 1. Monitoring and other core statutory duties: maintaining monitoring networks is absolutely critical for understanding where pollution is most acute, and what measures are effective to reduce pollution. There are also a number of other very important statutory duties undertaken by boroughs, which form the basis of action to improve pollution; 2. Emissions from developments and buildings: emissions from buildings account for about 15% of the NO_x emissions across London so are important in affecting NO₂ concentrations; 3. Public health and awareness raising: increasing awareness can drive behavioural change to lower emissions as well as to reduce exposure to air pollution; 4. Delivery servicing and freight: vehicles delivering goods and services are usually light and heavy-duty diesel-fuelled vehicles with high primary NO₂ emissions; 5. Borough fleet actions: our fleet includes light and heavy-duty diesel-fuelled vehicles such as minibuses and refuse collection vehicles with high primary NO₂ emissions. Tackling our own fleet means we will be leading by example; 6. Localised solutions: these seek to improve the environment of neighbourhoods through a combination of measures; and 7. Cleaner transport: road transport is the main source of air pollution in London. We need to incentivise a change to walking, cycling and ultra-low emission vehicles (such as electric) as far as possible.

Table 2 – Relevant Planning policy summary

1.3 Building Regulations Approved Document F: Ventilation

The Proposed Development is being designed as a mechanically ventilated building and will follow the requirements detailed in Building Regulations Approved Document F: Ventilation where applicable. This includes providing suitable ventilation rates to avoid the internal collection of air pollutants, whilst also limiting internal ingress of external pollutants into building.

2.0 Background Pollution Levels

2.1 Air Quality Management Area (AQMA)

Where significant levels of gaseous pollutants such as Nitrogen Oxides are identified in the outdoor air, as in an Air Quality Management Area (AQMA), the use of appropriate gas phase filtration in the building ventilation system should be considered. Developments where a portion of the site is within a local authority AQMA are automatically considered to be in a high pollution location. The Proposed Development is located within the Air Quality Management Area declared by the Royal Borough of Kingston upon Thames in 2003 due to exceedances in Nitrogen dioxide NO_2 and Particulate Matter (PM_{10}) (Figure 3).

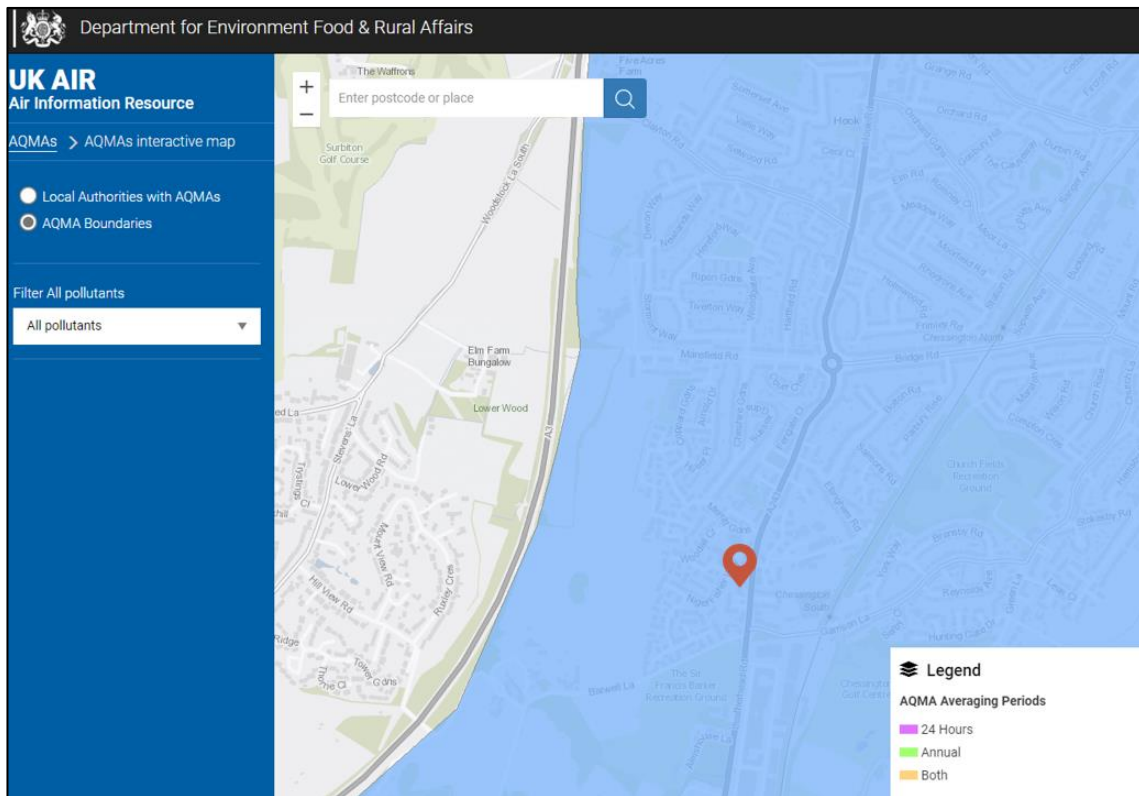


Figure 3 - AQMA Boundaries of the Proposed Development (AQMA interactive map)

Within the local area of Chessington, background concentrations of Particulate Matter ($\text{PM}_{10}/\text{PM}_{2.5}$) and Nitrogen Oxides (NO_2/NO_x) are within the current National objectives listed in Table 1 above, including the area in which the Proposed Development is located (as evidenced in Figure 4). Background pollutant concentrations are selected from the year 2022 in order to illustrate pollution data during a year of normalised emissions rates.

As shown in Figure 4 below, the annual mean concentration for Nitrogen Dioxide was $15.93 \mu\text{g}/\text{m}^3$, NO_x (as NO_2) was $22.85 \mu\text{g}/\text{m}^3$, PM_{10} was $14.40 \mu\text{g}/\text{m}^3$, and $\text{PM}_{2.5}$ was $8.54 \mu\text{g}/\text{m}^3$. As these pollutants are damaging to health at any level, they remain pollutants of concern. It is recommended that suitable mitigation measures should be implemented during the design of the development to reduce health risks to the future site and building users.



Figure 4 - 2022 Background Concentrations of NO_x, NO₂, PM₁₀, PM_{2.5} (DEFRA UK)

2.2 External Sources

2.2.1 Roads

The Proposed Development is situated in the south of Chessington, bounded by Leatherhead Road (A243) to the east. To the west of the site is the A3 Esher Bypass, a dual carriageway constructed to full motorway standards, which links to the southern end of the Kingston Bypass.

As seen from Figure 5 below, the nearby road Leatherhead Road (A243) experiences an elevated level of pollutant from NO_x as NO₂ which exceeds the current national air quality objectives and targets (40 $\mu\text{g}/\text{m}^3$). The roadside concentrations from Leatherhead Road (A243) in 2022 were Nitrogen Dioxide (25.63 $\mu\text{g}/\text{m}^3$), NO_x as NO₂ (51.84 $\mu\text{g}/\text{m}^3$), PM₁₀ (17.56 $\mu\text{g}/\text{m}^3$), and PM_{2.5} (9.98 $\mu\text{g}/\text{m}^3$). Conversely, the A3 Esher Bypass does not exhibit significant concerns regarding roadside air quality pollution.

Figure 5 below represents the impact of solely roadside emissions on the air quality of the area to gauge the influence of roads on local air quality (2022).

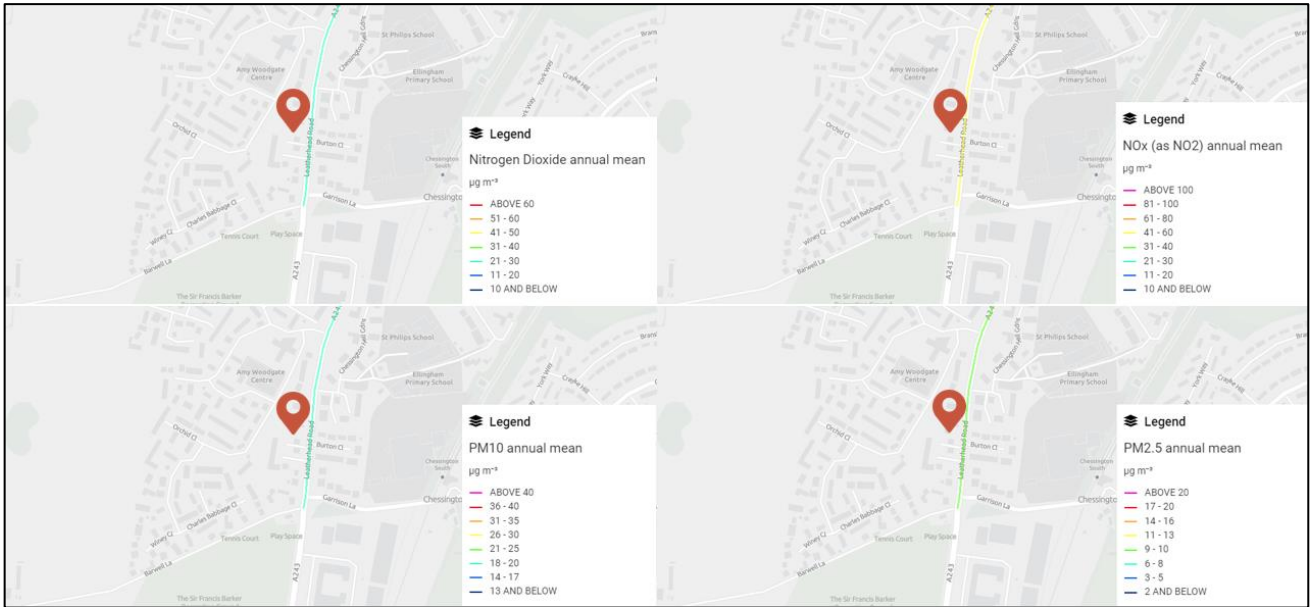


Figure 5 - Roadside concentrations near the Proposed Development (DEFRA UK, 2022)

2.2.2 Wind

Wind plays a vital role in the dispersion of pollutant particles across long distances dependent on the speed and direction of the prevailing wind. Whilst assisting in the removal of pollutants from certain areas, it simultaneously acts to worsen air quality in other areas to which the airmass is transported.

The wind rose below (Figure 6) shows how many hours per year the wind blows from the indicated direction for the area. Air pollution produced from the site is likely to be blown from South-West (SW) to North-East (NE). To the north-east of the site there are a large number of residential buildings, therefore pollution produced by the Proposed Development during construction and operation phases should be minimised to reduce pollution impacts to the surrounding areas.

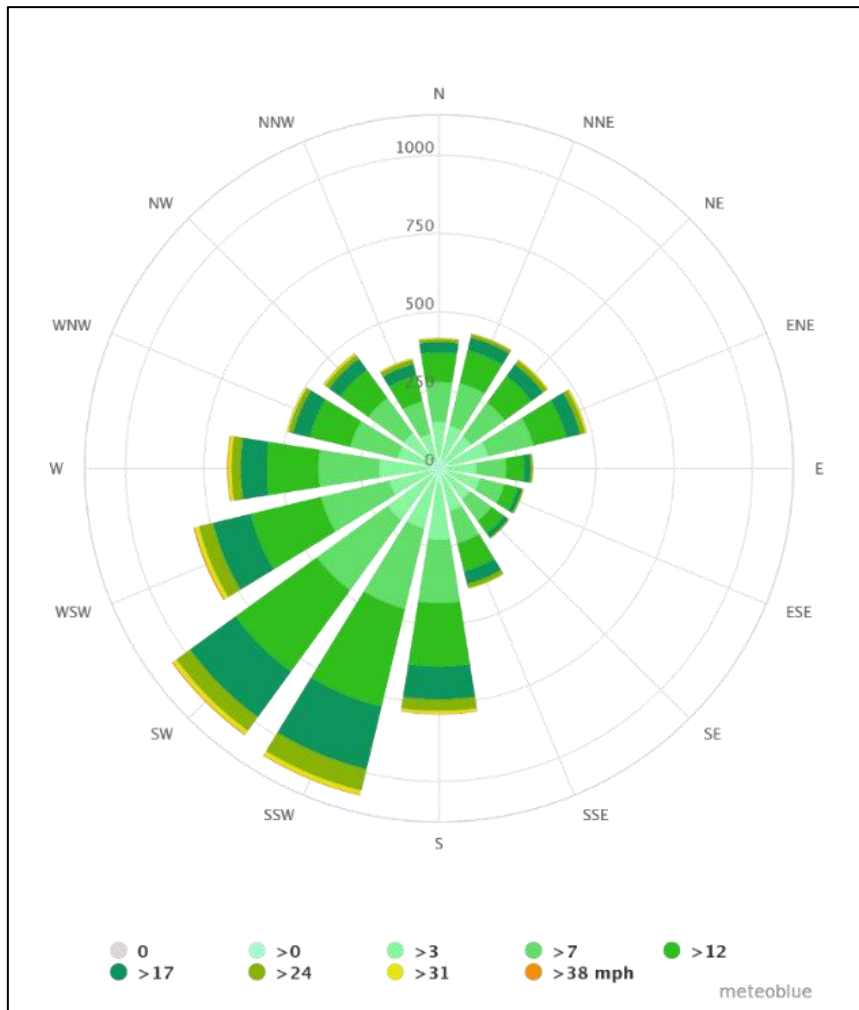


Figure 6 - Wind rose of the Proposed Development (Meteoblue)

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Air Quality Neutral

3.0 Air Quality Neutral

An Air Quality Neutral (AQN) development is one that meets or improves upon, the Air Quality Neutral benchmarks. These benchmarks set out the maximum allowable emissions of NO_x and Particulate Matter based on the size and use class of the proposed development. These benchmarks are based on research and evidence carried out by building and transport consultants and are designed to prevent the degradation of air quality from the combined emissions of individual developments.

There are two sets of benchmarks, which cover the two main sources of air pollution from new developments:

- Building Emissions Benchmark (BEB) – emissions from equipment used to supply heat and energy to the buildings.
- Transport Emissions Benchmark (TEB) – emissions from private vehicles travelling to and from the development.

A development must meet both benchmarks separately in order to be Air Quality Neutral. If one or both benchmarks are not met, appropriate mitigation or offsetting will be required. In addition, all developments in London are expected to meet the Air Quality Neutral benchmarks.

According to the 'Air quality Neutral London Plan Guidance (February 2023)', the Proposed Development is categorized as a minor development and a simplified procedure is applied. Minor developments for dwellings are defined as where the number of dwellings to be constructed is between one and nine inclusive. The Proposed Development consists of 6 no. 3 bed 6-person (3B6P) houses and 1 no. 3B6P bungalow, therefore qualifying as a minor development.

3.1 Building Emissions Benchmark (BEB)

Where minor developments include new heating systems, they can be assumed to meet the BEB in any of the following instances:

- the new heating system is a heat pump or other zero-emission heat source
- the new heating system includes one or more individual gas boilers with NO_x emissions rated at less than 40 mg/kWh
- the development is connecting to an existing heat network.

For the Proposed Development, the Design Team has confirmed that the heating system will rely on a zero-emission heat source with no gas boilers being used. Therefore, the BEB has been met as no NO_x emissions are produced during building operation.

3.2 Transport Emissions Benchmark (TEB)

For most developments, the key driver of transport emissions is the provision of car parking spaces. Therefore, a condition or legal agreement restricting car parking spaces to a specified maximum (not exceeding the amount assumed for the AQN calculation) should be applied.

Car parking should be restricted in line with levels of existing and future public transport accessibility and connectivity. The Proposed Development is located in outer London with good access to a range of services within walking distance. The site is well-served by public transportation, including several bus routes that run along the neighbourhood. The nearby Chessington South Railway Station offers access to London Waterloo and all stations in between, facilitating connections to central London and other areas in the vicinity.

The Design Team has confirmed that the Proposed Development will have a total of 7 no. car parking spaces. The overall provision amounts to one car parking space per dwelling, aligning with the London Plan car parking standards⁶ which state that developments in outer London boroughs with PTAL rating of 2 should be provided with a maximum of 1.5 car parking spaces per unit. Each dwelling would be provided with an Electric Vehicle charging point (TBC). On-site, there will be a total of 14 no. cycle parking spaces for residents, situated within cycle sheds within the property boundaries. Additionally, an external cycle stand will be available on site for visitors, complying with the minimum cycle parking standards stipulated in the London Plan.

Therefore, the TEB has been met as the proposed parking area does not exceed the maximum parking standards set out in policies T6 and T6.1 to T6.5 of the London Plan for new residential development. Appendix B outlines the maximum residential parking standards as stipulated in the London Plan.

3.3 Conclusions

To summarise, the Proposed Development can be qualified as Air Quality Neutral (AQN), as both benchmarks (BEB and TEB) have been met.

Furthermore, details of the specific appliances to be installed in the completed development are not always known at the planning application stage. Even when a specific appliance is assumed at planning application stage, for many reasons, this may be different to the appliance that is installed in the completed development. It is therefore strongly advised that a condition requiring approval of the appliance details is used to ensure that the installed system is as good as, or better than, that used in the AQN Assessment. For larger and more complex systems, abatement equipment may be needed to minimise emissions. Where abatement is required, the installation, use and maintenance of the abatement equipment should similarly be required by condition.

⁶ [The London Plan Guidance \(March 2021\): Policy T6.1 Residential parking](#)

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Indoor Air Quality Plan

4.0 Internal sources

4.1 Finishes and Furnishings

New buildings are often associated with high concentrations of VOCs; emitted mainly from paints, carpets, materials, and furniture. These emissions are highest when the building has just finished construction and reduce over time.

VOCs present a risk to the health and comfort of occupants if air concentrations exceed those known to cause adverse effects. Some are toxic and can impact children, particularly those in vulnerable groups (such as those who suffer from asthma and allergies). The most likely health impact from VOCs is short-term irritation of the eyes, nose, skin, and respiratory tract. Odour generated by VOCs can also be a concern to the occupants. Common indoor VOCs include formaldehyde, decane, butoxyethanol, isopentane, limonene, styrene, xylenes, perchloroethylene, methylene chloride and toluene. These products are often used within modern construction and could impact the indoor air quality of the building.

The following are various implementable methods to mitigate this risk:

- The internal finishes products specified should meet the emission limits, testing requirements and any additional requirements listed in Appendix A.
- Product containers should be disposed of safely and purchased only as much as is necessary to reduce waste and the unnecessary release of VOCs.
- Work should be sequenced to ensure that absorbent surfaces (e.g., carpets) are not installed until work that emits high levels of VOCs (e.g., coating) is complete.
- HVAC equipment and ductwork should be protected from dust and other pollutants during installation and when near to other construction or installation works.
- Ventilation systems and ductwork should be checked and cleaned prior to and during commissioning, so that pollutants are not released into the building when in use.
- Sources of formaldehyde should be identified and removed where possible, as this is one of the few pollutants that can be readily measured. If it is not possible to remove, exposure can be reduced by using a sealant on all exposed surfaces of panelling and other furnishings.

As the Proposed Development is a residential scheme, there are therefore associated internal finishes materials which would present a VOC risk. For the internal finishes materials that are installed, the above methodology must be implemented.

4.2 Cleaning and Storerooms

VOCs and other pollutants present within cleaning products may evaporate, contaminating the surrounding air. This can be controlled by ensuring that any cleaning products are stored in areas with high levels of ventilation to facilitate adequate dilution and removal. All storerooms should have mechanical extract to promote dilution. Natural cleaning solutions should be used wherever possible, and building users should always exercise caution and wear protective equipment when handling harsh chemical cleaning solutions.

4.3 HVAC Equipment

The Proposed Development is not using a gas-based energy strategy; instead, ASHP will be used to provide space heating for the dwellings through radiators and MVHR will be installed in bathrooms and Kitchens for air quality control. The hot water will be linked to the ASHP. Therefore, there will be no associated NO_x emissions released due to the implementation for this all-electric scheme.

4.4 Kitchens

Kitchens can be a significant source of indoor air pollution due to the pollutants given off by cookware, appliances and refrigeration units as well as harsh chemical degreasers and cleaning solvents that may be used during their maintenance. There are open kitchen spaces in the Proposed Development and used for cooking regularly. As a result, there will be substantial release of pollutants affecting the indoor air quality and therefore mechanical extracts will be required.

4.5 Tobacco

Smoking is not permitted in any indoor spaces. Therefore, the risk of indoor air pollution from tobacco (for example Benzene, a known human carcinogen) is low.

4.6 People

People, as users of the building, will generate moisture, CO₂ and odours which contribute to the indoor air quality of the development. High CO₂ concentrations often indicate high odour levels and poor indoor air quality. Indoor CO₂ levels can be impacted by several factors including the number of occupants, their activity levels, time spent in a room, and the ventilation rate.

Considering the Proposed development is a residential development, and the amount of time occupiers staying indoors can be potentially high, it is essential to take into account pollutants generated by people. Therefore, appropriate ventilation strategies are necessary.

4.7 Removal of Contaminant Sources Summary

There are a variety of internal pollutants that may impact the indoor air quality of the Proposed Development. Non-VOC emitting products and low VOCs construction products should be selected to minimise the contaminant sources.

Ventilation with filters and intakes and airflow pathways must be designed and installed in accordance with the building policy in all spaces to minimise the build-up of any air pollutants. When in the vicinity of the construction and installation works, HVAC equipment is to be protected and ventilation systems are to be checked and cleaned prior to and during commissioning to avoid releasing pollutants into the building.

5.0 Construction and Demolition

Demolition will take place in order to prepare the site for the new construction. In the case of material breakup and removal, the following impacts should be considered.

- Visible dust plumes.
- Dust deposition.
- Elevated PM₁₀ and PM_{2.5} concentrations.
- Increased concentrations of Nitrogen Oxides.

Air pollutants can result from on-site dust-generating activities such as the breaking-up of materials and the clearing of the existing site, as well as from the exhaust of diesel-powered vehicles and both static and non-road mobile machinery. Vehicles and people accessing and travelling across the site can also generate dust.

It is therefore important that the creation or release of air pollutants is minimised as far as possible, so that both internal and external air pollution levels are not significantly elevated as a result of the construction works carried out on the Proposed Development.

5.1 Dust Risk Assessment

A Dust Risk Assessment⁷ can assess the risk of each phase of work, as well as evaluate and identify suitable mitigation measures for each risk. As per the Institute of Air Quality Management's (IAQM) Guidance, activities on construction sites have been divided into four types: demolition, earthworks, construction and track out.

Figure 7 summarises the steps that must be taken to produce a Dust Risk Assessment.

⁷ [Guidance on the assessment of dust from demolition and construction V2.2, January 2024](#)

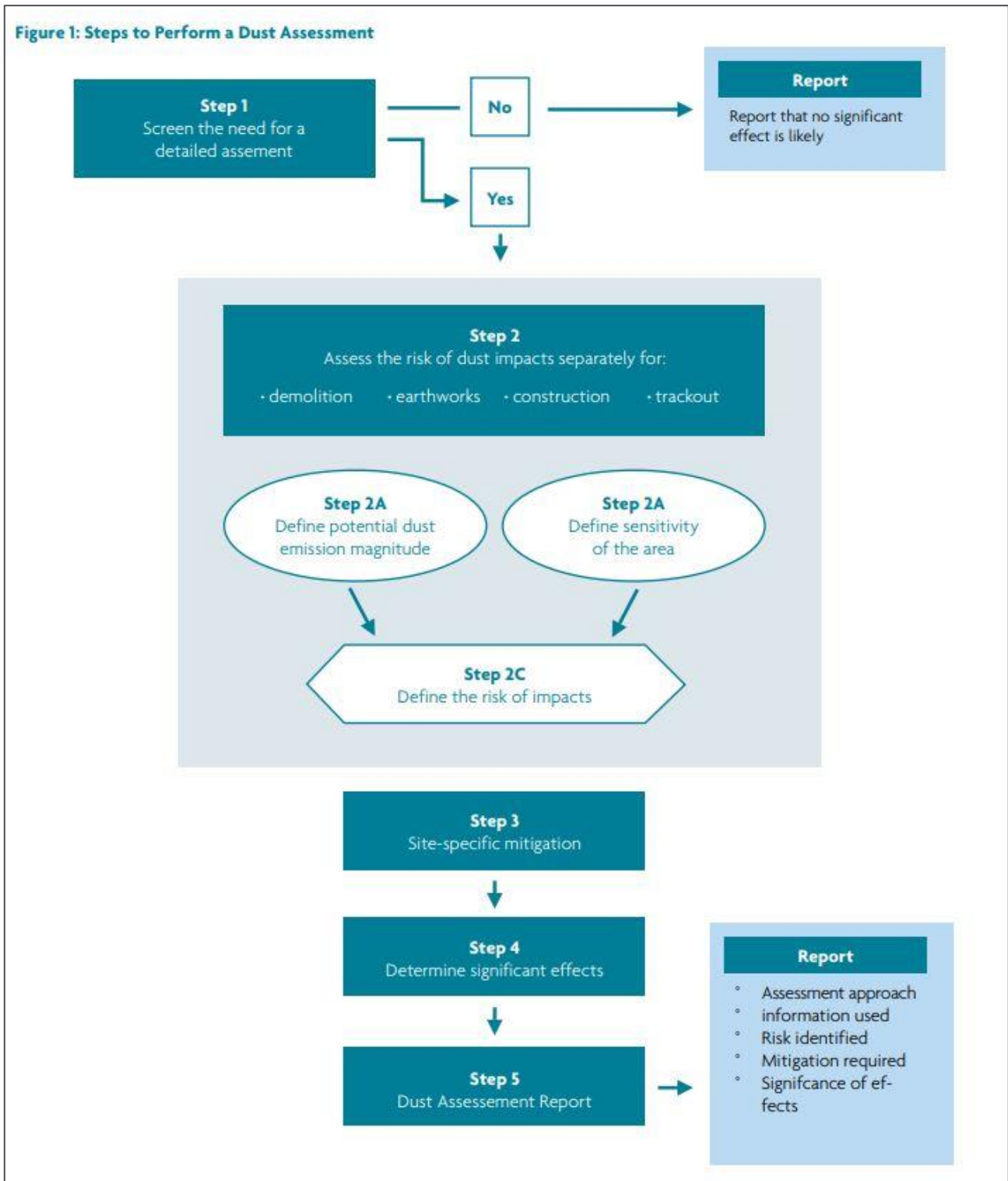


Figure 7 - Summary of Dust Risk Assessment process (Guidance on the assessment of dust from demolition and construction V2.2)

5.2 Dust control measures

As the construction of the Proposed Development will be undertaking localised site clearance and construction activities, the contractors will need to follow the details of: *The control of dust and emissions*

during construction and demolition *Supplementary Planning Guidance*⁸ so that the release of emissions of gaseous and particulate pollutants into the atmosphere is limited. A brief summary of the requirements is outlined below, addressing key measures for dust control.

5.2.1 Site management and maintenance

Responsible site management is imperative during any site clearance and the following construction phase, which require stakeholder engagement and regular site inspections. The application site must also be prepared through an effective site layout and implementation of green infrastructure while also maintaining runoff, cleaning, and soiling, and effectively dealing with spillages.

5.2.2 Vehicle emissions

The construction site will involve the use of vehicles and machinery which can significantly contribute to local air pollution. Therefore, all mobile vehicles should comply with the latest low emissivity targets; vehicle idling should be discouraged, and deliveries should be managed by a Construction Logistic Plan to effectively deliver and remove items from the site.

Future building users of the Proposed Development will be encouraged to use public transport and/or cycle routes as alternatives to single-occupancy cars. Plant items for the site will be from renewable or battery sources where possible to reduce the higher levels of Particulate Matter (PM₁₀/PM_{2.5}) and Nitrogen Oxides (NO₂/NO_x) emitted from petrol- or diesel-powered equipment.

5.2.3 Operations

Cutting, grinding, and sawing should be limited on-site and managed by dampening with water to reduce excessive dust generation. If mobile crushing and concrete bashing occur on-site, Royal Borough of Kingston upon Thames must be notified, and best practice procedures should be followed. Skips, chutes, and conveyors should be covered to limit dust escaping. Plant items for the site will be operated from renewable or battery sources where possible, to reduce the higher levels of Particulate Matter (PM₁₀/PM_{2.5}) and Nitrogen Oxides (NO₂/NO_x) emitted from petrol- or diesel-powered equipment.

5.2.4 Waste

Bonfires are forbidden, and the recycling or reuse of materials will be encouraged. A Pre-Demolition Waste Audit for the Proposed Development should be taken consideration so that the amount of demolition (site clearance) and construction waste can be assessed and monitored.

5.3 Mitigation measures

Any site clearance activities should use either soft stripping or water suppression to damp down dust. During construction, cement, sand, fine aggregates, and other fine powders should be sealed after use and if necessary stored in enclosed or banded containers or silos. Hard surfaces or paving should be used for all haul routes and routes should be swept and dampened regularly. Subject to the ground conditions the vehicle wheels should be washed down before leaving the site and all vehicles carrying dusty materials should be

⁸ [The control of dust and emissions during construction and demolition SPG, July 2014.](#)

securely covered when in transit. Dust suppressants (calcium magnesium acetate) could be used on roadsides if needed.

5.4 Site monitoring

It is important to continually monitor the site to manage the generation of Particulate Matter (PM₁₀/PM_{2.5}) and Nitrogen Oxides (NO₂/NO_x) during construction and demolition.

The Proposed Development should take regular energy and water meter readings during the construction phases and transport will be recorded for all deliveries to and from the site. Quantities and types of waste should also be monitored.

5.5 Non-road mobile machinery

All Non-Road Mobile Machinery (NRMM) of net power of 37kW and up to and including 560kW used during the course of the demolition, site preparation and construction phases shall comply with the emission standards set out in chapter 7 of the GLA's supplementary planning guidance "Control of Dust and Emissions During Construction and Demolition" dated July 2014 (SPG), or subsequent guidance. Unless it complies with the standards set out in the SPG, no NRMM shall be on site, at any time, whether in use or not, without the prior written consent of the local planning authority. The developer shall keep an up-to-date list of all NRMM used during the demolition, site preparation and construction phases of the development on the online register.

6.0 Relevant local authority plans or polices

As stated in Section 2.1 Air Quality Management Area (AQMA), the Proposed Development is located in an AQMA declared by the Royal Borough of Kingston upon Thames in 2003. Therefore, it is part of the Council's duty to put in place an Air Quality Action Plan (AQAP) and report annual progress to the Greater London Authority (GLA).

The revised AQAP for 2021 to 2026 builds upon the work done during the last five years under the 2016 - 2021 AQAP. Since 2016, the Council has taken significant steps to improve the local air quality. From 2016 to 2019 the Council network detected a steady decline in Nitrogen Dioxide from an average of 43.2µg/m³ across all monitoring sites in 2016 to an average of 36.0µg/m³ in 2019. The greatest single reduction was -35.3% on Kingston Road at Tolworth Station.

The current AQAP 2021 - 2026 covers the actions the Council intend to take to improve the air quality in the Borough over the next 5 years. The Royal Borough of Kingston upon Thames is committed to reducing the exposure of people in Kingston to poor air quality in order to improve health.

Therefore, the Council have developed actions that can be considered under seven broad topics:

1. Monitoring and other core statutory duties: maintaining monitoring networks is absolutely critical for understanding where pollution is most acute, and what measures are effective to reduce pollution. There are also a number of other very important statutory duties undertaken by boroughs, which form the basis of action to improve pollution;
2. Emissions from developments and buildings: emissions from buildings account for about 15% of the NO_x emissions across London so are important in affecting NO₂ concentrations;
3. Public health and awareness raising: increasing awareness can drive behavioural change to lower emissions as well as to reduce exposure to air pollution;
4. Delivery servicing and freight: vehicles delivering goods and services are usually light and heavy-duty diesel-fuelled vehicles with high primary NO₂ emissions;
5. Borough fleet actions: our fleet includes light and heavy-duty diesel-fuelled vehicles such as minibuses and refuse collection vehicles with high primary NO₂ emissions. Tackling our own fleet means we will be leading by example;
6. Localised solutions: these seek to improve the environment of neighbourhoods through a combination of measures; and
7. Cleaner transport: road transport is the main source of air pollution in London. We need to incentivise a change to walking, cycling and ultra-low emission vehicles (such as electric) as far as possible.

The September 2023 publication of the 2022 Air Quality Annual Status Report⁹ by the Royal Borough of Kingston upon Thames offers an overview of the borough's air quality throughout the year. The report encompasses sections on Air Quality Monitoring, Actions to Improve Air Quality, Planning Update and Other New Sources of Emissions, and Additional Activities to Improve Air Quality.

Section 4 of the 2022 Air Quality Annual Status Report proposes the implementation of further activities aimed at enhancing air quality:

- **The Royal London Borough of Kingston upon Thames Fleet**
There are a small number of zero emission and zero emission capable vehicles within the borough's fleet in 2022.

⁹ [2022 Air Quality Annual Status Report](#)

- **NRMM Enforcement Project**

The Royal London Borough of Kingston upon Thames is continuing to support the NRMM Enforcement project in 2022 – 23.

- **Air Quality Alerts**

The Council website promotes the AirTEXT service as well as recommends ways in which residents can reduce their exposure to and emissions of air pollution. The Council has also shared pollution episode alerts from the GLA forecasting service.

7.0 Summary

This AQA addresses the GLA planning policy requirement for the Proposed Development at 166 Leatherhead Road in Chessington. As required in the Air Quality Neutral London Plan Guidance (February 2023), an AQN is assessed, and the Proposed Development is qualified to be AQN.

Located within an AQMA declared by the Royal Borough of Kingston upon Thames in 2003, suitable mitigation measures should be implemented during the design of the development to reduce health risks to the future site and building users.

This AQA outlined key mitigation measures to reduce as far as possible the any contributions to the external air quality at the Proposed Development during the construction and use phases. Construction and demolition/fabric removal on site will be carried out in line with the *Control of Dust and Emissions during Construction and Demolition SPG* as a best practice guidance document, to minimise air pollution derived from these activities. The proposed energy strategy does not incorporate gas-fired or solid-/oil-fuelled heating systems and therefore there are no associated Nitrogen Oxides (NO_x) emissions during the operation of the building. The encouragement of Electric Vehicle (EV) charging points and cycle storage also promote sustainable transport to the site.

In summary, the Proposed Development has addressed the planning policy requirements regarding air quality and is thought to have a limited impact on future external air quality. By following the guidance within this AQA during the construction and pre-occupancy phases, the Proposed Development will have as less impacts on the local air quality as possible. Construction will also have a limited impact on the internal air quality, with the suggested active measures within this report implemented to improve the indoor air quality for building user satisfaction.

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Appendices

Appendix A TVOCs Emission criteria by product type

Emission limit			Testing
Formaldehyde	Total volatile organic compounds (TVOC)	Category 1A and 1B carcinogens	Requirement
Interior paints and coatings			
≤ 0.06 mg/m ³	≤ 1.0 mg/m ³	≤ 0.001 mg/m ³	EN 16402 / ISO 16000-9 / CEN/TS 16516 / CDPH Standard Method v1.1
Additional requirements Meet TVOC content limits. Paints used in wet areas (e.g. bathrooms, kitchens, utility rooms) should protect against mould.			
Wood-based products (including wood flooring)			
≤ 0.06 mg/m ³ (Non-MDF) ≤ 0.08 mg/m ³ (MDF)	≤ 1.0 mg/m ³	≤ 0.001 mg/m ³	ISO 16000-9 / CEN/TS 16516 / CDPH Standard Method v1.1/ EN 717-1 (formaldehyde emissions only)
Flooring materials (including floor levelling compounds and resin flooring)			
≤ 0.06 mg/m ³	≤ 1.0 mg/m ³	≤ 0.001 mg/m ³	ISO 10580/ ISO 16000-9/ CEN/TS 16516 / CDPH Standard Method v1.1
Ceiling, wall and acoustic and thermal insulation materials			
≤ 0.06 mg/m ³	≤ 1.0 mg/m ³	≤ 0.001 mg/m ³	N/A
Interior adhesives and sealants (including flooring adhesives)			
≤ 0.06 mg/m ³	≤ 1.0 mg/m ³	≤ 0.001 mg/m ³	EN 13999 (Parts 1-4) / ISO 16000-9 / CEN/TS 16516 / CDPH Standard Method v1.1
* Compliance with emission limits shall be demonstrated after 28 days in an emission test chamber or earlier as stipulated by the relevant testing requirements standard.			

Appendix B Maximum residential parking standards

Location	Number of beds	Maximum parking provision*
Central Activities Zone Inner London Opportunity Areas Metropolitan and Major Town Centres All areas of PTAL 5 – 6 Inner London PTAL 4	All	Car free~
Inner London PTAL 3	All	Up to 0.25 spaces per dwelling
Inner London PTAL 2 Outer London Opportunity Areas	All	Up to 0.5 spaces per dwelling
Inner London PTAL 0 – 1	All	Up to 0.75 spaces per dwelling
Outer London PTAL 4	1-2	Up to 0.5 - 0.75 spaces per dwelling+
Outer London PTAL 4	3+	Up to 0.5 - 0.75 spaces per dwelling+
Outer London PTAL 2 – 3	1-2	Up to 0.75 spaces per dwelling
Outer London PTAL 2 – 3	3+	Up to 1 space per dwelling
Outer London PTAL 0 – 1	1-2	Up to 1.5 space per dwelling
Outer London PTAL 0 – 1	3+	Up to 1.5 spaces per dwelling^

* Where Development Plans specify lower local maximum standards for general or operational parking, these should be followed.

~ With the exception of disabled persons parking, see Part G Policy T6 .1 Residential parking.

+ When considering development proposals that are higher density or in more accessible locations, the lower standard shown here should be applied as a maximum.

^ Boroughs should consider standards that allow for higher levels of provision where there is clear evidence that this would support additional family housing.



SRE Registered Office | London Square

3 London Square | Guildford

Cross Lanes | Guildford | GU1 1UJ

01730 710044

info@sre.co.uk

www.sre.co.uk