



## CST Environmental & Acoustic Consultants

Air Quality Assessment

Proposed Development

Land @ London School of Theology  
Green Lane, Northwood  
HA6 2UW

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<b>Contents</b>	<b>Page</b>
<b>1 Executive Summary</b>	<b>2</b>
<b>2 The Proposals</b>	<b>3</b>
<b>3 Description of Site</b>	<b>4</b>
<b>4 Objectives of Report</b>	<b>5</b>
<b>5 Assessment of Proposals</b>	<b>6</b>
<b>6 Relevant Legislative Framework</b>	<b>6</b>
<b>7 Air Quality Assessment</b>	<b>8</b>
<b>8 Discussion of Results and Conclusions</b>	<b>10</b>
<b>9 Appendix 1- Plan Extracts</b>	<b>11</b>
<b>10 Appendix 2 - NO2 &amp; Traffic Data</b>	<b>13</b>
<b>11 Appendix 3 - Proposed Design Scheme</b>	<b>14</b>



Report Prepared by:

Checked by:

LDS

Date: 6th June 2017

## 1 Executive Summary

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- 1.1 This report has been commissioned by Westcombe Homes Ltd. in support of a forthcoming Town Planning application for redevelopment of land currently forming part of the London School of Theology.
- 1.2 Extant permission for redevelopment of the proposal site and the construction of 9 flats (4 x 2 bedroom and 5 x 3 bedroom) within a single 2 /3 story new building exists (Planning ref: - 10112/APP/2016/3976).
- 1.3 In May 2017, planning permission was refused for a modified development proposal of the site, comprising 10 residential flats (5 x 2 bedroom and 5 x 3 bedroom units) (ref: - 10112/APP/2017/737). We were instructed by the applicants to undertake an Air Quality Assessment in support of this application. We are not aware of any air quality issues being raised as a reason for refusal of this scheme.
- 1.4 Revised proposals have been produced which aim to deal specifically with the local authority concerns regarding internal layout of the 10 unit scheme. In summary the changes are to the internal layout of the new building only. The revised internal layouts result in the removal of 2 duplex apartments, one on the basement and ground, and another on ground and first floor. These have been removed and replaced with single level units. The footprint and external appearance of the building has remained the same, which results in the provision 12 x 2 bedroom residential flats with associated parking and landscaping.
- 1.5 This report updates our February 2017 Air Quality Assessment. The assessment has, as before, been undertaken using published local and national air quality and road traffic data. The data have been used to predict NO<sup>2</sup> concentrations at the nearest sensitive receptor of the proposed development.
- 1.6 A stand alone traffic report prepared by Monson Consultants for the applicant shows that the proposed development for 12 units can be predicted to generate a total of 20 movements / day on to Green Lane (the adjoining highway). This figure represents an additional 4 daily movements above that predicted for the approved scheme on this site (planning reference: 10112/APP/2016/3976).

- 1.7 An extra 20 two way movements per day amounts to a 0.15% increase on two-way traffic flow (AADT) for the B469 based on the latest published data (2016).
- 1.8 DfT traffic data (tabulated at appendix 2) show that the AADT on Green Lane has fluctuated year on year over the period 2008 – 2016, but overall, shows a decreasing trend.
- 1.9 The assessment results have been compared against the objectives set out in the Air Quality Limit Value Regulations of 2000, and the EPUK (formerly the National Society for Clean Air) document "Development Control: Planning for Air Quality."
- 1.10 The results of the assessment show:
- 1.11 The site does not fall within the L.B. Hillingdon 2003 Air Quality Management Area (AQMA) in respect of Nitrogen Dioxide (NO<sub>2</sub>) and therefore, by definition, local air quality can be considered currently to be acceptable and within legal limits. A map showing the extent of the declared L.B. Hillingdon AQMA is appended to this report (appendix 1).
- 1.12 The magnitude of change caused by the proposed development is considered to be negligible in accordance with the guidelines published by UPUK. These results are consistent with the anticipated changes in traffic associated with the proposed development and therefore air quality should not constitute a material consideration in the assessment of the planning application so far as the current proposals are concerned.

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## 2 The Proposals

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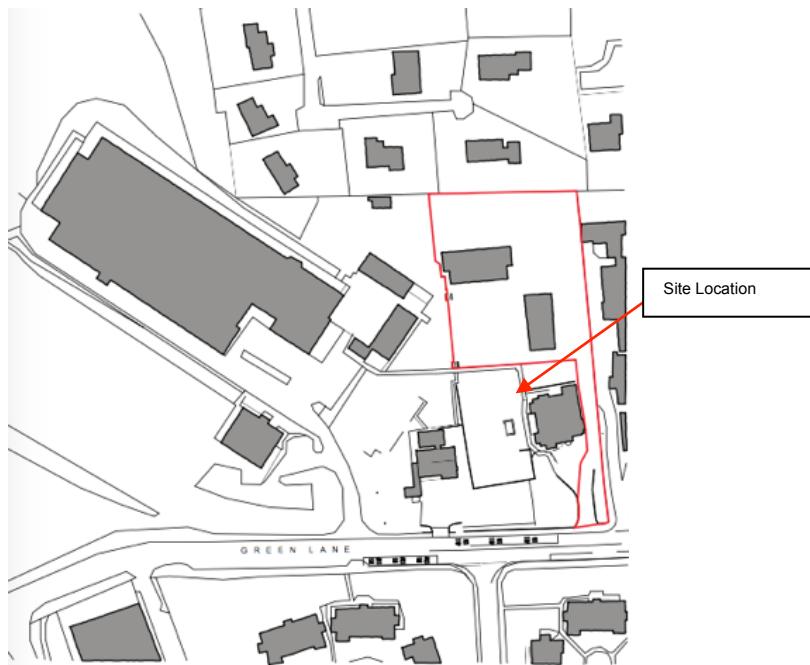
- 2.1 The proposals may be summarised as follows:

- Demolition of an existing residential block and pair of semi detached houses used formerly as a residential enclave located within the grounds of the London School of Theology.
- Construction of a new four storey detached residential building comprising 12 residential flats (12x 2 bedroom units) with associated parking and landscaping. The proposed new build occupies a similar footprint to that adopted for the 10-unit scheme (reference 10112/APP/2017/737). The 2 duplex apartments previously proposed (one on the basement and ground floor and another on ground and first floor) have been removed and replaced with single level units. Extracts of the proposed design scheme are shown at appendix 3.

### 3 Description of Site

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3.1 The site comprises an area of around 0.3ha and is to be found at approximate grid reference E:508819, N:191585. It is further identified by the location plan below together with a recent aerial photograph.



Proposal Site – Location



Aerial Photograph of Proposal Site

### 3.2 Relevant Planning History

#### 10112/APP/2016/2135 The London School Of Theology, Green Lane Northwood

Erection of a four storey detached residential building comprising 8 x 2-bedroom units with associated parking and landscaping, following demolition of existing residential block and pair of semi-detached houses.

Decision: 07-10-2016 Approved

#### 10112/APP/2016/3976 The London School Of Theology, Green Lane Northwood

Erection of a four storey detached residential building comprising 9 residential flats (4 x 2 bedroom and 5 x 3 bedroom units) with associated parking and landscaping, following demolition of existing residential block and pair of semi-detached houses

Decision: 31-01-2017 Approved

#### 10112/APP/2017/737 The London School Of Theology, Green Lane Northwood

Erection of four storey residential building comprising 10 residential flats (5 x 2 bedroom and 5 x 3 bedroom units) with associated parking and landscaping, following demolition of existing residential block and pair of semi-detached houses

Decision 31-05- 2017 Refused

(Note: The local planning authority raised no issues regarding concern for local air quality for the above scheme during the application process).

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## 4 **Objectives of Report**

### 4.1 The objectives of this report are:

- To define the current state of local air quality around the development site
- To assess the impact of existing air quality on the proposed development
- To assess the impact that the proposed development may have on local air quality.

## 5 Assessment of Proposals

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5.1 The Local Air Quality Assessment Methodology used in this assessment is based on that provided by the Highways Agency in its publication "Design Manual for Roads and Bridges, Volume 11 - Environmental Assessment" (DMRB). The DMRB model provides a set of criteria to determine whether the traffic associated with a potential application site is significant enough to adversely impact on air quality (and therefore warrant detailed modelling of vehicle emissions). In summary the criteria are:

- the road alignment will change by 5 m or more; or
- daily traffic flows will change by 1,000 AADT or more; or
- Heavy Duty Vehicle (HDV) flows will change by 200 AADT or more; or daily average speed will change by 10 km/hr. or more; or peak hour speed will change by 20 km/hr. or more.

5.2 Reference to Appendix B of the updated Monson traffic study produced for this application shows that the proposed development, with an additional 20 cars and 0 HDV movements per day, is below any of the criteria above. At a qualitative level it can be concluded therefore that the traffic associated with the development will have a negligible effect on local air quality. However, as a precautionary measure, further DMRB based modelling of vehicle-derived emissions has been conducted to objectively demonstrate the negligible impact of the proposed development on local air quality. This work is set out at section 7 of this report.

5.3 Nitrogen dioxide (NO<sup>2</sup>) has been selected as the pollutant for investigation as it is the main pollutant of concern. This gas has a potentially harmful impact on human health and is strongly associated with emissions from road traffic.

## 6 Relevant Legislative Framework

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6.1 The National Planning Policy Framework published on 27 March 2012, states inter alia that the planning system should contribute to and enhance the natural and local environment, preventing new development from contributing to or being adversely affected by unacceptable concentrations of air pollution. In relation to air quality policy, the document states:

*"Planning policies should sustain compliance with and contribute towards EU Limit Values or national objectives for pollutants, taking into account the presence of Air Quality Management Areas and the cumulative impacts on air quality from individual sites in local areas. Planning decisions should ensure that any new development in Air Quality Management Areas is consistent with the local air quality action plan".*

6.2 One of the objectives of the LAQM regime is for local authorities to enhance integration of air quality into the planning process. Current Local Authority Air Quality Management Policy Guidance 16 recognises land-use planning as having a significant role in terms of reducing population exposure to air pollution.

6.3 The London Plan: produced by the Mayor of London outlines the spatial development strategy for Greater London. All London Boroughs are required to have regard of the London Plan in their own development plans, planning decisions and spatial strategies. The London Plan contains specific policies around land-use and traffic planning aimed at reducing air pollution. Local authorities must ensure that new developments are sustainable, safe, secure, well designed and improve the environment with an emphasis on air quality. Policy 7.14, "Improving Air Quality" deals with air pollution and states that:

*"The Mayor will work with strategic partners to ensure that the spatial, climate change, transport and design policies of this plan support implementation of his Air Quality Strategy to achieve reductions in pollutant emissions and public exposure to pollution".*

Policy 7.14 makes special reference to development proposals;

*Development proposals should:*

- a) minimise increased exposure to existing poor air quality and make provision to address local problems of air quality (particularly within AQMAs).*
- b) promote sustainable design and construction to reduce emissions from the demolition and construction of buildings, following the best practice guidance in the Greater London Authority (GLA) and London Councils' "The control of dust and emissions from construction and demolition – "Best Practice Guidance"11.*
- c) aim to be "air quality neutral" and not lead to further deterioration of existing poor air quality (such as in AQMAs). Offsetting should be used to ameliorate negative impacts associated with development proposals. Increased exposure to existing poor air quality should be minimised.*

*d) ensure that, where provision needs to be made to reduce emissions from a development, this is usually made onsite. Where it can be demonstrated that onsite provision is impractical or inappropriate, and that it is possible to put in place measures having clearly demonstrated equivalent air quality benefits, planning obligations or planning conditions should be used as appropriate to ensure this, whether on a scheme by scheme basis or through joint area-based approaches.*

*e) where the development requires a detailed air quality assessment and biomass boilers are included, the assessment should forecast pollutant concentrations. Permission should only be granted if no adverse air quality impacts from the biomass boiler are identified".*

## 7 Air Quality Assessment

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- 7.1 The principles for air quality assessments as set out in the latest guidance and tools provided by The Mayor of London for air quality assessment. LLAQM.TG(16) has been consulted in constructing an assessment framework for the proposed development.
- 7.2 The proposal site is accessed via an existing access road directly from Green Lane, part of the B469, a local distributor running from the A404 in the west to the A4125 in the east. Department for Transport (DfT) traffic data for years 2008 - 2016 shows some year on year variation in the Annual Average Daily Traffic flow but overall the data show a reducing trend in flow volume. The AADT traffic data are tabulated at appendix 2.
- 7.3 L.B. Hillingdon has undertaken annual monitoring for Nitrogen Dioxide for a number of years within its area. From 2003 to 2010 NO<sup>2</sup> was monitored using long term diffusion tube modelling at a location within 1 km of the proposal site. This was a roadside location on the A404 north of its junction with Green Lane and can be identified as HD78 on a map which can be found at appendix 1. The diffusion tube results for the years 2008 – 2010 are set out in the following table:

Year	Result ( $\mu\text{g}/\text{m}^3$ ) Annual
2008	32.5
2009	32.8
2010	30.6

Table 1 – Annual Diffusion Tube Monitoring Results (HD 78)

7.4 Following its 2010 AQ review LB Hillingdon decided to discontinue monitoring at HD 78 as year on year results showed little change and were comfortably within the NO<sup>2</sup> annual limit value of 40.0 µg/m<sup>3</sup>.

7.5 Where possible a broad spread of monitoring data should be used to verify the results of an objective assessment. However it is often the case that no such spread of roadside monitoring locations exist within a study area. This is the position with the proposal location and it has not, therefore, been possible to perform a formal model verification study with a precision automatic monitoring station. However for the purposes of this assessment it has been possible to use a comparable diffusion tube site (HD74) as a representative data source for years 2010 – 2013. The chosen site (which is also a roadside location) is identified on the plan at appendix 1 as HD 74 and is located at grid reference E: 511887, N:186565.

7.6 Annual results for HD74 site for the year 2008 – 2013 are set in the following table:

Year	Result (µg/m <sup>3</sup> ) Annual
2008	32.3
2009	28.9
2010	31.3
2011	28.4
2012	28.5
2013	28.3

Annual Diffusion Tube Monitoring Results – Site HD 74

7.7 Calculation of Predicted Impacts

7.8 A method for calculating the rate at which NO<sup>2</sup> declines with distance from the kerbside has been formulated by Laxen and Marner. The method allows nitrogen dioxide measurements made at one distance from a road to be used to predict concentration at a different distance from the same road.

7.9 This relationship has been used to calculate the concentration of the nitrogen dioxide at the selected receptors within the proposed development for year 2013 (latest available data).

7.10 For ease of reference the empirical formula used is given at appendix 2.

7.11 Background concentrations for the assessment undertaken at the site were sourced from the LAQM website. The LAQM website contains information on local background monitoring. The highest recorded background values from the nearest 1km square centred grid close to the site was used in the analysis. The values from grid reference 531500, 105500 for 2013 base year (latest annual data available) have been used in the calculation.

7.12 Defra has conveniently provided a spreadsheet calculation for the distance calculation which was used to calculate the predicted NO<sup>2</sup> concentrations at the nearest proposed ground floor receptors. A screen shot of the calculation procedure is shown at appendix 2.

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## 8 Discussion of Results and Conclusions

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8.1 The results of the analyses undertaken as part of this assessment indicate that:

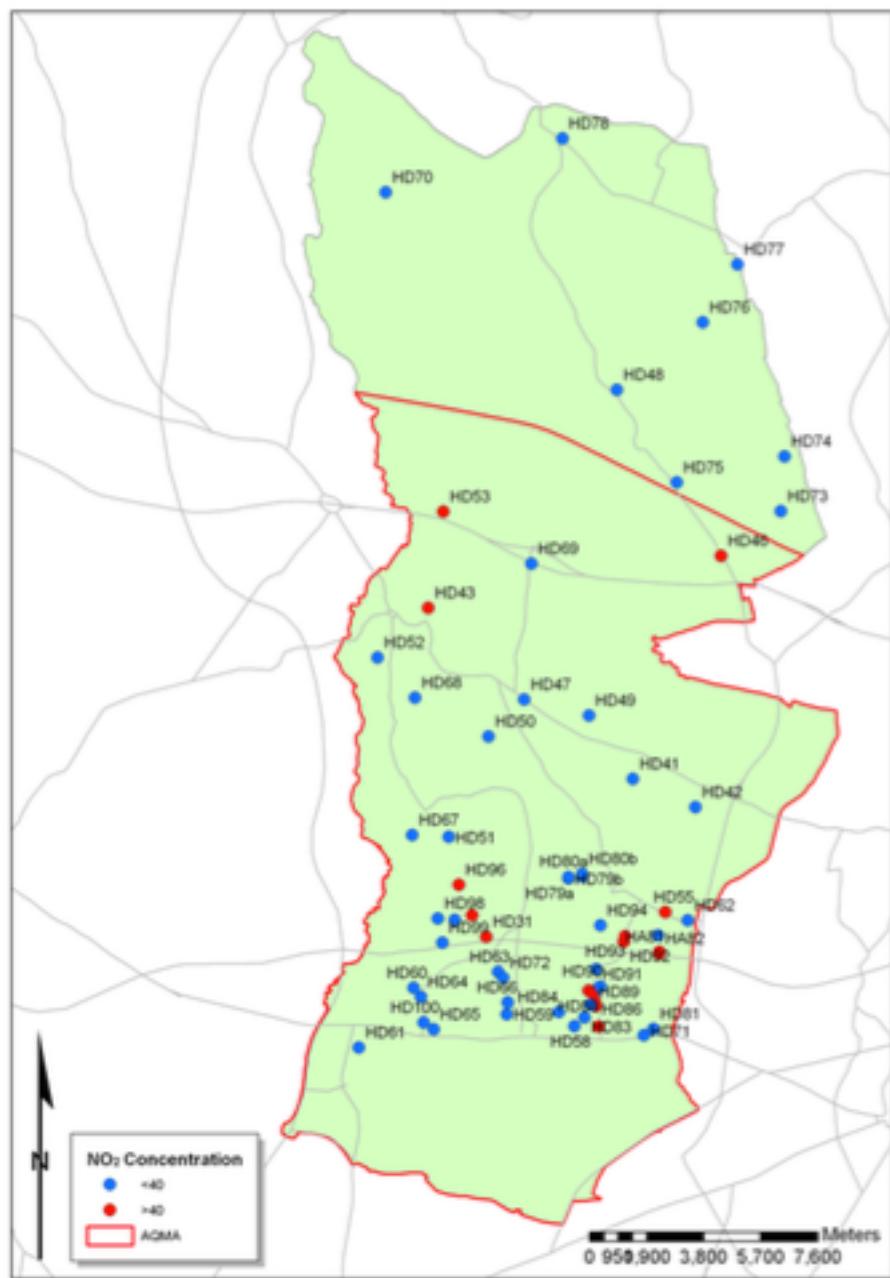
- The annual mean pollution concentration limit of 40µg/m<sup>3</sup> for NO<sub>2</sub>, as set out in the Air Quality Limit Value Regulations would not have been exceeded at the ground floor front receptors of the new building for the reference year of 2013. The maximum predicted annual mean pollution concentrations of 22.3µg/m<sup>3</sup> for proposed receptor is 44% below the national objective.
- The magnitude of change caused by the proposed development is negligible in accordance with the latest guidelines published by UKEPA (2017).

8.2 Overall, it is considered that there will be no adverse impact on ambient air quality as a result of the proposed development both at and near to the development site. The development will not introduce new receptors that will breach the limits set out in the Air Quality Limit Value Regulations. Therefore it can be concluded that the modelled changes to the air quality do not constitute a material consideration in the assessment of the planning application for the site.

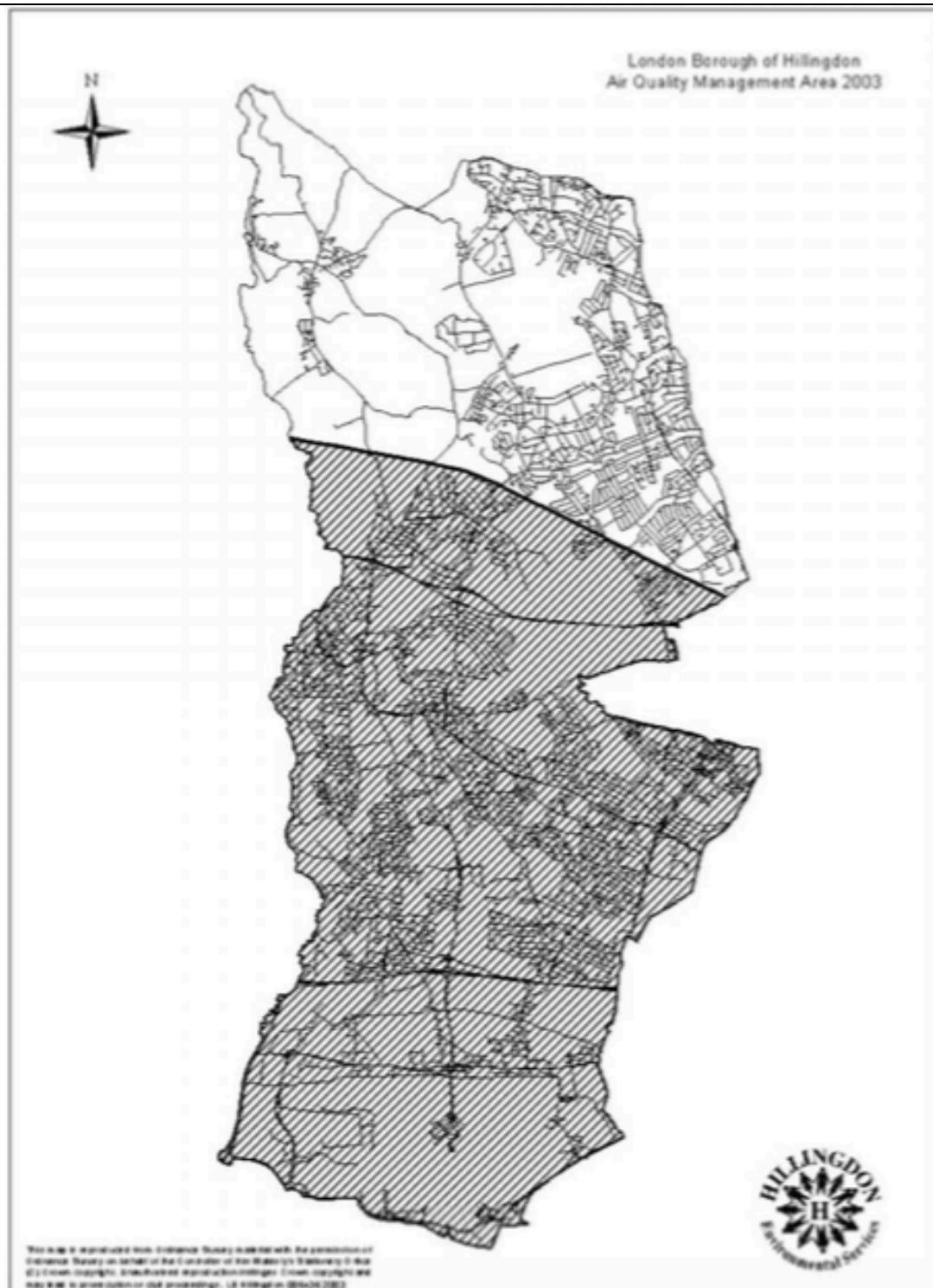
## 9 Appendix 1- Plan Extracts

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Figure A3-1 Map of Annual Mean Objective Exceedances at Non-Automatic Monitoring Sites



L.B. Hillingdon – Air Quality Monitoring Stations  
(Taken from LB Hillingdon Annual Air Quality Report 2011)



## 10 Appendix 2 - NO2 & Traffic Data

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$$C_z = ((C_y - C_b) / (-0.5476 \times \ln(D_y) + 2.7171)) \times (-0.5476 \times \ln(D_z) + 2.7171) + C_b$$

Where:

$C_z$  is the total predicted concentration of NO<sub>2</sub> (µg/m<sup>3</sup>), at distance  $D_z$ ;

$C_y$  is the total measured concentration (µg/m<sup>3</sup>) at distance  $D_y$ ;

$C_b$  is the background concentration (µg/m<sup>3</sup>);

$D_y$  is the distance from the kerb at which concentrations were measured;

$D_z$  is the distance from the kerb (m) at which concentrations are to be predicted;  $\ln(D)$  is the natural log of the number

### Empirical NO<sub>2</sub> Distance / Concentration Formula (Laxen & Marner)



**BUREAU  
VERITAS**



**Air Quality  
CONSULTANTS**

**Enter data into the red cells**

Step 1	How far from the KERB was your measurement made (in metres)?	1	metres
Step 2	How far from the KERB is your receptor (in metres)?	49	metres
Step 3	What is the local annual mean background NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	20.66	µg/m <sup>3</sup>
Step 4	What is your measured annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> )?	28.3	µg/m <sup>3</sup>
Result	The predicted annual mean NO <sub>2</sub> concentration (in µg/m <sup>3</sup> ) at your receptor	22.3	µg/m <sup>3</sup>

Warning: your receptor is more than 20m further from the kerb than your monitor, treat result with caution

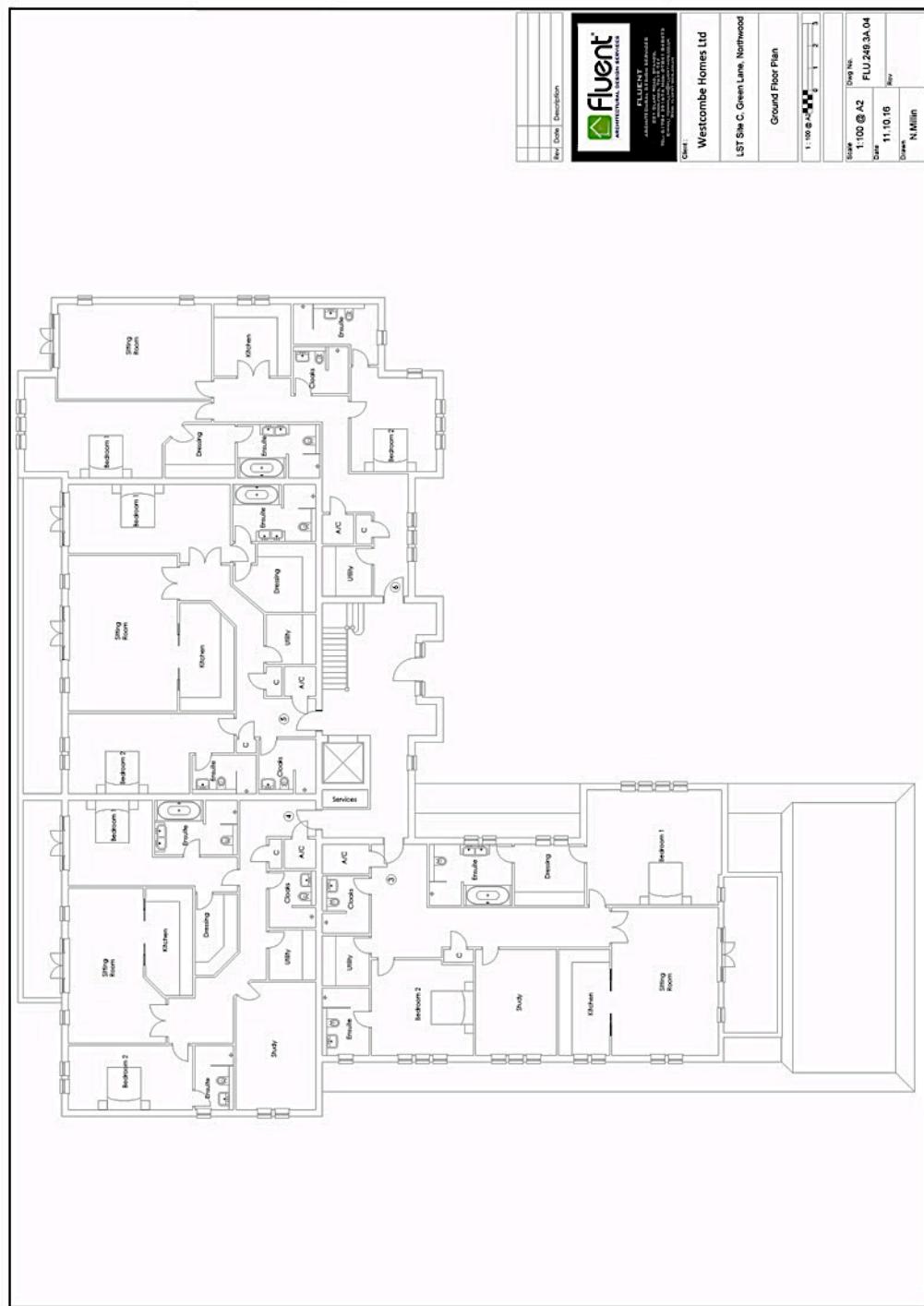
Screen Shot of Calculation – Predicted NO<sub>2</sub> at Proposed Receptor Location

Year	AADT
2008	8142
2009	N/A
2010	10489
2011	11704
2012	12171
2013	10702
2014	8099
2015	7705
2016	10073

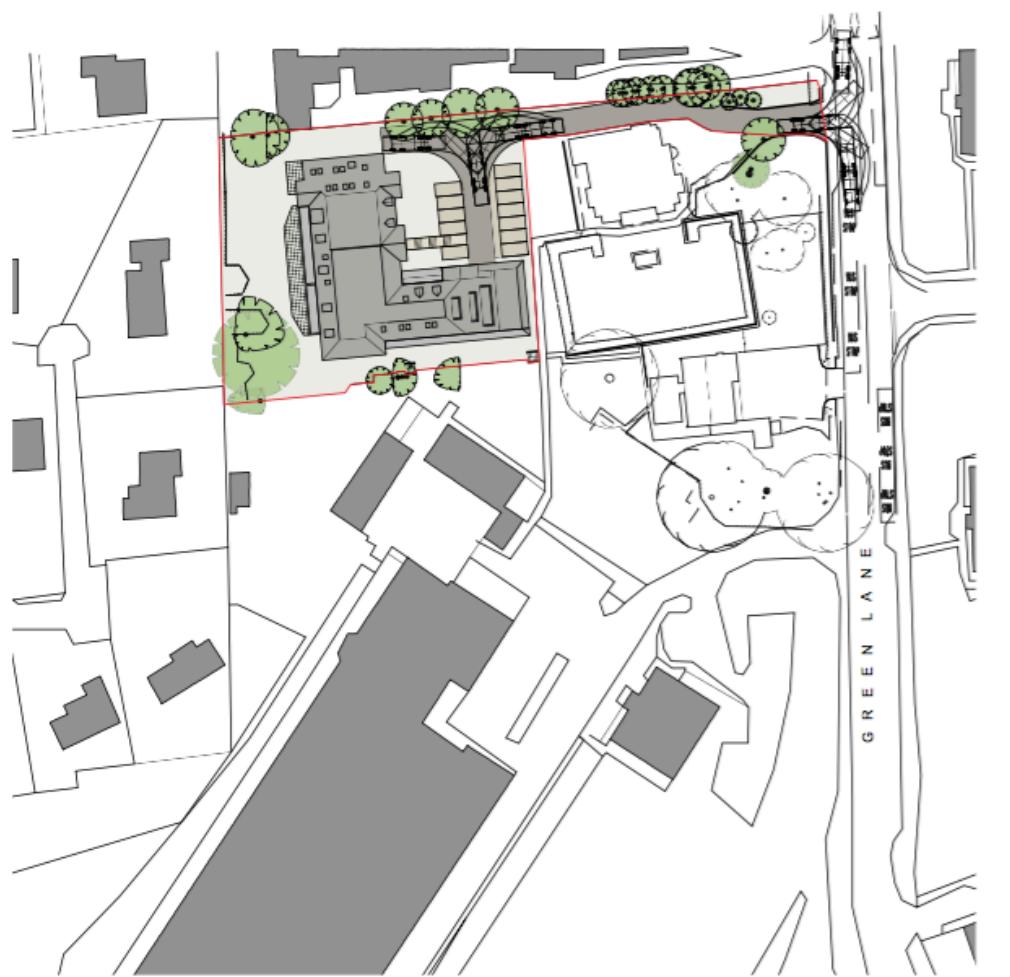
Green Lane (B469) Annual Traffic Data

## 11 Appendix 3 - Proposed Design Scheme

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Ground Floor (Proposed)



Site Layout (Proposed)