

# Response to the Review of the Wind Assessment for Vastern Court, Caversham Road, Reading Response

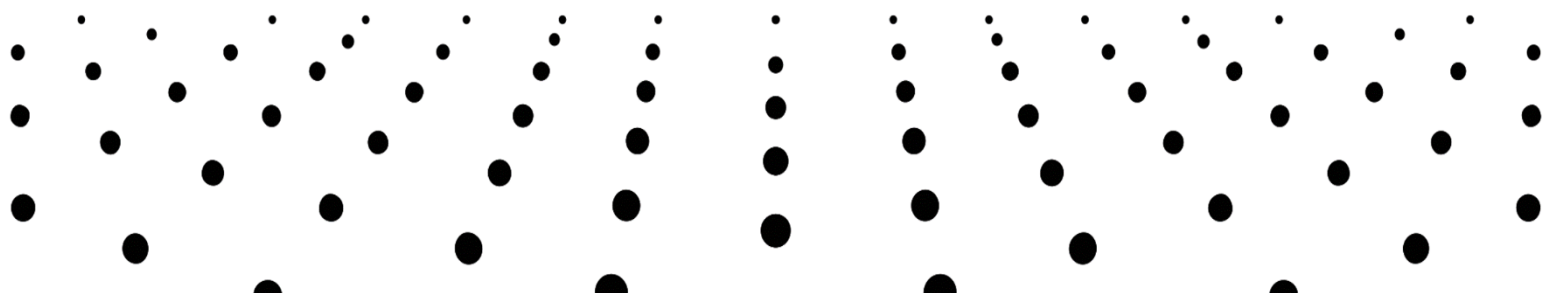
14/03/2022

Document number: RMB 203 Vastern Court WMC Review Response v3



Xi Engineering Consultants, CodeBase, Argyle House, 3 Lady Lawson Street, Edinburgh, EH3 9DR, United Kingdom.

T: +44 (0)131 290 2250, xiengineering.com, Company no. SC386913



## Document Summary

Following an application for outline planning permission for a development known as Vastern Court (REF 200328) which has submitted to Reading Borough Council, BRE were appointed to review the Wind Microclimate (WMC) chapter of the Environmental Statement and supporting Technical Report. Through BRE's review of the WMC chapter issues and points were identified that require further clarification. This document outlines the initial response to the points that have been raised and the routes by which these points can be resolved.

Action	Name	Date	Version	Amendment
Originator	Donald Black	14/03/22	v1	Internal Issue
Checked by	Dr Keith Cobry	14/03/22	v2	Review
Checked by	Donald Black	14/03/22	v3	For Release

Matters relating to this document should be directed to:	
Mark-Paul Buckingham	E: mp@xiengineering.com
Managing Director	T: 0131 290 2250
Donald Black	E: donaldblack@xiengineering.com
Head of Measurement Engineering	T: 0131 290 2253
Principal contacts at client's organisation	
Michael Elliot	E: melliott@ramboll.com
Senior Managing Consultant	T: +44 1225 748 420
	M: +44 7976643414

## 1. Introduction

BRE's review of the WMC chapter of the Vastern Court planning application raised a number of omissions and areas where clarifications were sought. This document forms the initial response to address these points directly or to highlight where further work will take place to expand upon the original chapter to resolve these issues that have been raised. The summary table of issues to be addressed presented by BRE is given in Appendix A - Summary of Issues to be Addressed.

## 2. WMC Chapter Issues to be addressed

BRE comments are repeated in bold with Xi's response following.

### **Reading Borough Council Local Plan Policy CR10 (Tall Buildings) has not been considered**

Reading Borough Council Local Plan Policy (2019) CR10: Tall Buildings provides guidance on the development of buildings consisting of 10 storeys of commercial floorspace or 12 storeys of residential (equating to 36 metres tall) or above. Particular local requirements are listed for CR10a: Station Area Cluster, CR10b: Western Grouping and CR10c: Eastern Grouping. In addition, a list of general requirements is provided. Of these, the following are relevant to the local wind microclimate: "Create safe, pleasant and attractive spaces around them, and avoid detrimental impacts on the existing public realm" and "Mitigate any wind speed or turbulence or overshadowing effects through design and siting". These are discussed in Paragraph 5.3.47, and reference that wind assessment be performed against the Lawson Comfort Criteria. This statement will be included in an updated version of the report.

### **More information should be provided and justified regarding the level of detail used in the modelling of the target buildings**

The simulations were performed using model files provided by Ramboll (issued on 2nd January 2020), *19127 – Parameters Plans\_3D – combined.skp*, *PP-105 – Parameter Plan – Plot Heights Mixed Use.pdf*, *PP103 Buildings.skp*, *20-01-07\_amended zmap-for information.dwg*). No further additions or modifications to the provided Proposed Development were made.

**Confirm whether landscaping measures have been incorporated in the CFD model**

Landscaping measures were not included in the simulated Proposed Scheme. This represents a worst-case scenario and is typical in Wind Microclimate assessments.

**Provide full details of the Lawson criterion used for pedestrian comfort**

The reported Lawson Comfort Criteria reported wind bins are for the basic London LDDC formulation, however the labelling of two categories were changed at the request of the client. "Pedestrian Walking" was changed to "Strolling" and "Business Walking" was changed to "Walking". All other bins have the correct labelling. Reruns of simulations for all three Configurations will utilize the Lawson LDDC Comfort Criteria with the correct labelling, including "Pedestrian Walking" and "Business Walking". The wind bins are: 0-2 m/s "Outdoor Dining"; 0-4 m/s "Pedestrian Sitting"; 4-6 m/s "Pedestrian Standing"; 6-8 m/s "Pedestrian Walking"; 8-10 m/s "Business Walking"; >10 m/s "Uncomfortable". Xi agree that the client request to re label "Pedestrian Walking" and "Business Walking" is confusing and will label these as per the London LDDC official labels

**The assessment does not appear to include the effects of gust wind speeds (GEM) in the pedestrian comfort assessment. This is an essential requirement and must be included**

At the time of the original writing, a Gust Equivalent Mean feature was not available in SimScale. Such gust assessments for RANS mean results are often made by the professional judgement of a wind engineer based on experience with similar developments. This omission in the prior report draft is noted. A Gust Equivalent Mean feature has been added to SimScale since the prior writing, and will be included in updated simulations of all three Configurations. This is defined as the highest sustained gust over a 3-seconds period having a 1:50 probability of being exceeded per year. Xi propose to rerun the model to include GEM results.

**The location of the weather station used in this assessment must be provided and ideally wind roses from that weather station should be included in order to assess whether the data are appropriate for the Application site**

Weather data was sourced from MeteoBlue. MeteoBlue provides simulated weather data. These weather models are based on the NMM (Nonhydrostatic Meso-Scale Modelling) or NEMS (NOAA Environment Monitoring System) technology, which enables the inclusion of detailed topography, ground cover and surface cover. Each forecast is archived by MeteoBlue

at least once a day. From these data, a complete hourly history of the weather situation is created. The data provide robust wind records, particularly for locations beyond the proximity of a local weather station where validity begins to drop as the range from the weather station increases. In this instance, Vastern Court is approximately 35 km from Heathrow Airport. For whichever method the applicant prefers, Xi can show the wind roses for Heathrow Airport in relation to those used from simulated data of the Vastern Court site, or Xi can directly use Heathrow Airport weather data with appropriate wind exposure categories applied.

### **Details of how the data from the weather station have been transformed to the Application site must be included**

As described above, the wind data are supplied from simulated weather data. Xi can compare the simulated data against the data from the nearest weather station at Heathrow Airport to show its validity.

### **It is recommended that different colours be used to signify different wind speeds.**

The colour schemes for these plots are widely recognised in general wind microclimate assessment practice, thus SimScale does not allow them to manually be changed. The meaning will be more clearly explained in the relevant figure captions in an upcoming version of the report to mitigate any confusion.

### **There is a potential lack of correlation between some wind comfort and wind safety results. Please check and confirm that the results from the CFD analysis are correct.**

The comparison between Figure 11 and Figure 16 referenced in the review displays the same physical results calculated by the CFD simulation, but with differing wind bin scales visualized. Figure 11 displays contours according to the basic Lawson LDDC Comfort Criteria and Figure 16 displays contours according to the Modified Lawson Comfort Criteria, such as provided in guidance developed for The City of London. The basic Lawson LDDC wind bins have a maximum category at 10 m/s: when this occurs <5% of the time it is termed "Business Walking" and when this occurs >5% of the time, this is termed "Uncomfortable". The Modified Lawson LDDC bins have a maximum comfort category at 8 m/s, similarly when occurring <5% of the time being termed "Walking" and when occurring > 5% of the time being termed "Uncomfortable". This scale, however, has the additional >15 m/s category with a much stricter time percentage limit (> 0.022%); this is a significant qualitative difference and explains the differences highlighted in the review, with respect to the safety

assessment. The stricter assessment will be used for discussion of required mitigation measures, but viewing of both scales (with respective time percentage limits) provides useful information to the reader. This presentation of the two scales for visualisation and interpretive purposes will be explained in more detail in an updated version of the report.

**There are some unexpected results around the edges of the roof terraces. Please confirm whether the roof parapets have been correctly modelled.**

The simulations were performed using model files provided by Ramboll (issued on 2nd January 2020), *19127 – Parameters Plans\_3D – combined.skp*, *PP-105 – Parameter Plan – Plot Heights Mixed Use.pdf*, *PP103 Buildings.skp*, *20-01-07\_amended zmap-for information.dwg*). Parapets were not included in the provided models none were separately added. It was anticipated parapets would be included in a subsequent mitigation stage which did not take place.

**No discussion of, or proposals for, mitigation measures is included. Given the significant areas of unsafe wind speeds predicted to occur on and around this proposed development, it would be expected that potential mitigation measures and their efficacy is discussed**

The Technical Appendix does not discuss mitigation measures, even though it is mentioned in an introductory paragraph. This omission is noted, and the reference in the introductory paragraph will be removed in an upcoming version of the Appendix. In its stead, the reader is referred to the Wind Microclimate ES chapter section Assessment of Residual Effects, Additional Mitigation (p.9-10), where typical measures applied in similar developments are suggested. Note that at the time of writing, the project was not at the Detailed Design stage, where more detailed measures at affected Sensitive Receptors would be proposed. It was expected a further iteration would be required where mitigation would be included.

### 3. Appendix A - Summary of Issues to be Addressed

Appendix 9.1 Section No	Issue	Reviewer Comment
2.4	Omission	Reading Borough Council Local Plan Policy CR10 (Tall Buildings) has not been considered
5.2	Clarification	More information should be provided and justified regarding the level of detail used in the modelling of the target buildings
5.2	Clarification	Confirm whether landscaping measures have been incorporated in the CFD model
5.0	Omission	Provide full details of the Lawson criterion used for pedestrian comfort
5.0	Omission	The assessment does not appear to include the effects of gust wind speeds (GEM) in the pedestrian comfort assessment. This is an essential requirement and must be included
5.0	Omission	The assessment does not appear to include the effects of gust wind speeds (GEM) in the pedestrian safety assessment. This is an essential requirement and must be included
6.0	Omission	The location of the weather station used in this assessment must be provided and ideally wind roses from that weather station should be included in order to assess whether the data are appropriate for the Application site
6.0	Omission	Details of how the data from the weather station have been transformed to the Application site must be included
7.0 & 8.0	Clarification	It is recommended that different colours be used to signify different wind speeds.
7.0 & 8.0	Clarification	There is a potential lack of correlation between some wind comfort and wind safety results. Please check and confirm that the results from the CFD analysis are correct.
7.0 & 8.0	Clarification	There are some unexpected results around the edges of the roof terraces. Please confirm whether the roof parapets have been correctly modelled.
New Section	Omission	No discussion of, or proposals for, mitigation measures is included. Given the significant areas of unsafe wind speeds predicted to occur on and around this proposed development, it would be expected that potential mitigation measures and their efficacy is discussed