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# Meeting the challenges of planning policy for wind microclimate of high-rise developments in London

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## Abstract

In the drive to contain urban sprawl and the desire to promote sustainable urban development that enhances the quality of inner city life, urban regeneration in London and in other major cities of the United Kingdom (UK) is facing ever more stringent scrutiny by planning authorities. With increasing emphasis on recreational use of outdoor areas in the vicinity of major urban new-build developments, designers and developers are facing up to the need to shape the external wind microclimate to ensure suitability for future use of open spaces and to deliver a low impact on public areas within the vicinity of the site. In the UK, tall buildings are drawing the attention of planning authorities like no other type of development due to their potential to cause downdrafts of fast upper-level winds, strong flow accelerations around building corners and funneling between neighbors. Planners expect to see due consideration from an early stage, not only via a comprehensive and robust wind assessment but also by demonstrating inbuilt design measures that offset or even prevent unacceptable impacts within an existing ‘present-day’ context plus, importantly, within a future context where other equally tall structures are expected to emerge. This technical paper will document the challenges of the planning process for wind assessment of tall buildings in the UK and in particular discuss the requirements of Environmental Impact Assessments (EIA) and the intricacies of wind engineering approaches that support this process.

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## 1. Introduction

Large-scale developments of inner city areas within London and in other major UK cities are currently facing stringent scrutiny by planning authorities. With impetus on sustainable urban development that enhances the quality of inner city life and facilitates recreational use of the open spaces in and around any proposed development, developers are becoming increasingly aware of the need to optimize the local wind microclimate in order to ensure such areas are suitable for future pedestrian uses as well as to minimize the impact on public areas within the vicinity

of the site. Due to the potential for new developments to beneficially impact the quality of inner city life, but with the equally possible risk of detrimentally impacting on the local wind conditions, UK planning authorities expect due consideration of the wind microclimate from the early stages of the design of such proposals.

Details of this process – including the wind climate analysis, wind tunnel testing techniques and criteria used, are presented in this paper.

### Nomenclature

$c$	dispersion parameter of the Weibull distribution
$k$	shape parameter of the Weibull distribution
$p$	probability of wind to blow from a given direction
$P$	probability that a specified wind speed is exceeded for a given wind direction
$V$	wind speed

## 2. Legislative Context

The legislative context relating to the wind microclimate is contained within national and regional planning policies. The planning policy and guidance on this subject matter are summarized in the sub-sections below.

### 2.1. National Planning Policy

The UK wide ‘National Planning Policy Framework’ (NPPF) came into force in March 2012 [1]. There are no national planning policies directly relating to wind microclimate issues. However, the benefits of a high quality built environment are emphasized in the NPPF. An example of this is presented in Paragraph 58, which states: “...using streetscapes and buildings to create attractive and comfortable places to live, work and visit...”.

### 2.2. Regional Planning Policy

The planning guidance contained within ‘The London Plan – The Spatial Development Strategy for London Consolidated with Alterations since 2011’, published in March 2015 [2], consolidates ‘The London Plan 2011’ [3] with the ‘Revised Early Minor Alterations to the London Plan’ published in October 2013 [4] and the ‘Further Alterations to the London Plan’, published in March 2015 [5].

The planning guidance contained within the ‘London Plan 2011’ places great importance on the creation and maintenance of a high quality environment for London. Under Policy 7.6B – Architecture, the plan states that buildings and structures should:

- Be of a proportion, composition, scale and orientation that enhances, activates and appropriately encloses the public realm;
  - Not cause unacceptable harm to the amenity of surrounding land and buildings, particularly residential buildings, in relation to privacy, overshadowing, wind and microclimate;
  - Provide high quality indoor and outdoor spaces and integrate well with the surrounding streets and open spaces.
- Also, under Policy 7.7 – Location and Design of Tall and Large Buildings, the plan states that:
- Tall and large buildings should not have an unacceptably harmful impact on their surroundings;
  - Tall buildings should not affect their surroundings adversely in terms of microclimate, wind turbulence...

Wind microclimate is therefore an important factor in achieving the desired planning policy objective. Additionally, consideration of pedestrian comfort has been referenced in Policy 5.3 - Sustainable Design and Construction, Policy 6.10 - Walking, Policy 7.4 - Local Character and Policy 7.5 – Public Realm and although no specific reference is made to wind microclimate, this would imply the inclusion of wind as a factor for assessing levels of comfort within London’s external spaces.

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