

TOWN AND COUNTRY PLANNING ACT 1990 (AS AMENDED) SECTION 78

**TOWN AND COUNTRY PLANNING APPEALS (INQUIRIES PROCEDURE)
RULES 2000**

Appeal by: Fusion Manchester DevCo Ltd

Against refusal of planning permission for:

**Full planning permission for a 28-storey purpose built student accommodation
building (Sui Generis)**

**Land at Deansgate South
Manchester**

**Planning Inspectorate Ref: APP/B4215/W/21/3287525
Planning Application Ref: 129406/FO/2021**

**SUMMARY PROOF OF EVIDENCE BY ALEX TURPITT
DIRECTOR, ARCHITECTURAL AERODYNAMICS LTD.**

1.0 INTRODUCTION

1.1 My name is Alex Turpitt. I am a Wind Engineer and I hold the degree of MEng (Hons) Aerospace Engineering awarded by Brunel University. I am also a chartered engineer with the Institute of Mechanical Engineering.

1.2 My proof of evidence sets out:

- I. Several significant flaws in Chapter 12 of the ES – Wind Microclimate Methodology
- II. Why these flaws result in an assessment which is not sufficiently robust, with real conditions on site expected to be notably worse than those reported

1.3 This appeal relates to the Council's decision to refuse full planning permission for a 28-storey purpose-built student accommodation building (sui generis).

2.0 THE CASE FOR THE COUNCIL

- 2.1** It is my view that the wind microclimate assessment has not been completed in accordance with industry best practice and does not allow for comparison of expected wind conditions against the long-standing wind comfort and safety criteria for wind.

Chapter 12 of the ES – Wind Microclimate Methodology

- 2.2** Chapter 12 of the Environmental Statement is not considered to be comprehensive in providing the necessary details to determine the validity of the study. I address the inadequacies as follows.
- 2.3** The industry standard for judging suitability in terms of wind conditions in specific locations is the Lawson Criteria. For a location to be deemed suitable for a given activity, windspeeds at that location must remain beneath the relevant thresholds for prescribed percentages of time. The total period should be summed across all wind angles.
- 2.4** The subject assessment does not calculate the total period of time wind speeds exceed comfort or safety thresholds. Instead, individual wind angles are assessed independently, without combining to find total exceedances. Because the chapter does not sum exceedances across every wind angle, it is not possible to state what each location is comfortable for, or that it passes the relevant safety criteria. At the very least, wind conditions are therefore windier than those reported in the Appellant's assessment and could, at worst, represent a safety concern for users in and around the site.

- 2.5** Wind conditions as experienced by pedestrians can be broken down into 2 components – the *mean* and the *gust*. The mean is the wind speed averaged over a given length of time (usually 10 minutes), whilst the gust can serve to subject pedestrians to significant increases in wind speeds over a short period time. The Lawson criteria prescribe that an assessment takes into consideration both the mean and gust equivalent mean (GEM) wind speeds, with the highest of those values being used for the analysis. The ES Chapter has used only the mean component of wind speed.
- 2.6** Because the chapter does not include calculations using the GEM wind speed, it is not possible to state what each location is comfortable for, or that it passes the safety criteria. Wind conditions are therefore windier than those reported by the Appellant and could, at worst, represent a safety concern for users in and around the site.
- 2.7** It is best practice to assess the proposed development both within the context of existing surrounds and consented future developments. It should be the windier of these configurations which drives the requirement for wind mitigation in any area. The ES Chapter has not assessed the development in the context of existing surrounds, it is therefore possible that worst-case wind conditions are not being reported. It would be prudent to test the development without these developments in place to ensure the worst-case has been assessed.

- 2.8** It would be recommended to repeat the assessment using best practice wind climate methodologies, rather than “virtual met mast data” as has been used in the current study.
- 2.9** It is noted that only one set of frequency data is used. It is assumed that this describes the annual wind frequency distributions of wind speed and direction at the site. It would be best practice to analyse wind conditions for all seasons. This is to ensure that the worst / windiest season is analysed, and mitigation is provided to ensure suitable conditions at these times. If the assessment has been based on annual wind data, it is likely to be under-reporting wind conditions at the site.
- 2.10** Without assessing winter conditions, it is not possible to state what each location is comfortable for, and conditions could, at worst, represent a nuisance for users in and around the site.
- 2.11** Paragraph 12.6.1 of the ES states that “*Wind Microclimate Guidelines for Developments in the City of London....has been used as guidance for this assessment*”. These guidelines recognise potential deficiencies of using a single methodology for a development of this nature and would require the use of both CFD and wind tunnel testing, this is particularly true when conditions are expected to be significantly windy or gusty.

- 2.12** The criteria on which the guidelines are based (Lawson, 1990) specifically states that a gust speed should be calculated for these studies and that gusts cause the majority of cases of annoyance and distress and should be assessed in addition to hourly average wind speeds. For this reason and for the proposals in question, these guidelines would suggest that wind tunnel testing would be needed in conjunction with the CFD studies. From experience, I would recommend the same.
- 2.13** By conducting the study only via CFD and with the deficiencies noted, it is not possible to state what each location is comfortable for, or that it passes the safety criteria. Wind conditions are likely to be windier than those reported by the Appellant's assessments and could, at worst, represent a safety concern for users in and around the site.
- 2.14** Despite the flaws in the methodology, both the original and revised studies still concludes that there are exceedances of the safety criteria. It is likely that these exceedances are significantly more extreme than the revised (March 2022) chapter suggests. Without assessing the true value of exceedance of the safety or comfort criteria, it is not possible to recommend suitable mitigation. It is therefore likely that the suggestion of trees being used to mitigate these winds is also unreliable. It is also not possible to determine if these exceedances are present in the existing scenario or introduced with the proposed development. Without a full assessment and verification of the effectiveness of wind mitigation, it is not possible to state what each location is comfortable for, or that it passes the safety criteria. Wind conditions are therefore windier than those reported and could, at worst, represent a safety concern for users in and around the site.

3.0 CONCLUSION

3.1 I have summarised some key parameters of the methodology employed for the current study which do not confirm to industry best practice. The revised study received in March 2022 does not address the issues raised in this evidence which are still relevant to the assessment. Each of these individually has the potential to represent wind conditions inaccurately, such that they appear less windy than they are. In summary, these key areas of concern are:

- The total percentage of time the wind speed at any given location exceeds the comfort or safety threshold has not been calculated. Wind conditions are therefore likely to be significantly windier than those reported which could, at worst, represent a safety concern for users of the site.
- The CFD methodology employed does not include the gust component of wind. Wind conditions are therefore likely to be significantly windier than those reported which could, at worst, represent a safety concern for users of the site.
- The study has not considered the development in the context of existing surrounds (i.e. in the absence of consented schemes). Wind conditions in that scenario are therefore likely to be materially different than those reported which could cause a nuisance to users of the site.
- The study has not considered wind conditions across every season. Wind conditions are therefore likely to be windier than those reported which could cause a nuisance to users of the site.

3.2 The study is therefore not considered robust and does not accurately provide an assessment of wind conditions following completion of the proposed development. In reality, the wind conditions would be notably worse than those presented. Without an updated assessment, it is not possible to state that there is not a major adverse effect impacting safety of users in and around the site. Likewise, it is not possible to conclude that the Appellant's proposed wind mitigation will be effective (assuming that it can be implemented).