



23<sup>rd</sup> October 2023

Housing, Regeneration and Planning  
Haringey Council  
River Park House  
225 High Road  
London, N22 8HQ

Dear Samuel,

**THFC Hotel S73 Application – Wind Microclimate Review**

A detailed review of the wind microclimate assessment forming part of the ES Addendum, submitted in support of the S73 planning application for the proposed THFC Hotel, forming Plot 3 of the Northumberland Development Project (NDP), has been carried out by Urban Microclimate Limited. The review is intended to advise on the suitability of the method of assessment, the criteria used for the study, the results obtained and the conclusions derived.

The review is based on the following reports:

- Chapter 16 of the Environmental Statement Addendum Volume 2 Northumberland Development Project Hotel S73 Application, August 2023
- Appendix 16.1: Wind Technical Report, July 2023;
- Design & Access Statement (DAS) Addendum, 2023; and
- Details of the proposed Development included in the submitted drawings.

In addition, a desk-based review of the Site and surrounding area has been carried out using internet-based aerial and street level photos.

The review does not extend to a detailed technical analysis, and we have not conducted our own assessments.

## Legislation, Planning Policy and Guidance

The review of national, regional and local policies includes references to superseded documents and incorrect references to current policies. LB Haringey's Development Management DPD (adopted July 2017) is not referenced, though this document does include microclimate as a design consideration for tall buildings. However, this omission and the mis-references are not material to the assessment approach or requirements. Ensuring that conditions are suitable for pedestrian activities, in accordance with the industry standard Lawson criteria, generally confirms compliance with policies.

## Assessment Methodology

Potential construction effects have been scoped out of the ES, as being insignificant. The justification provided for this is considered acceptable.

The assessments of baseline and completed Development effects applies boundary layer wind tunnel testing of a physical scale model in conjunction with long-term wind statistics applicable to the Site and the industry standard Lawson criteria for pedestrian comfort and safety. The overall approach is in accordance with best practice.

Five scenarios are assessed in detail:

1. An updated Baseline comprising the existing Site within the context of existing surrounding conditions (including vegetation);
2. Completed Development with proposed landscaping within the context of the existing surrounding conditions;
3. Completed Development with proposed landscaping and wind mitigation measures within the context of the existing surrounding conditions;
4. Completed Development with proposed landscaping within the context of existing and committed future developments excluding the Lendlease Scheme (which is pending a judicial review); and
5. Completed Development with proposed landscaping within the context of existing and committed future developments including the Lendlease Scheme.

The wind tunnel model is of suitable scale and extent, and the buildings generally appears to have been modelled to an appropriate level of detail. However, there are some potential issues with the assessment scenarios and model:

- Whilst the existing Site conditions at the time of an assessment is a standard Baseline, the updated Baseline makes comparisons with the effects of the consented Hotel difficult and potentially misleading – this is discussed further below.
- Available images of the wind tunnel model suggest that all existing landscaping within the Site may not have been modelled. In particular, trees around the southeast side of the stadium formed part of the wind mitigation scheme developed in the 2015 ES but do not appear to have been modelled.

It is also unclear if the further mitigation measures committed to in the 2015 ES, including further trees in the central areas of the podium, solid signs hanging from the southeast facade of the stadium and porous screens extending out from south and east facades of the stadium, have not been implemented or are potentially just omitted from the model. It is also unclear if the stepped geometry of the stadium façade, which may have localised benefits at some entrances, has been modelled. As a result, the assessed Baseline conditions may be overly conservative which, in turn, may exaggerate the reported beneficial effects of the completed Development.

- The 2015 ES assessed an interim scenario comprising the completed Hotel development in the absence of the Plots 4 and 5. This appeared to represent the worst case for the consented Hotel, and the EIA Context Overview presented in Paragraph 16.2.2 appears to at least partially reference this scenario. No justification for omitting this scenario for the proposed Hotel has been provided.
- The effectiveness of the preliminary wind mitigation measures developed for Plots 4 and 5, and accounted for within the 2015 ES, has not been verified with the proposed Hotel introduced in place of the consented Hotel. This is despite worse conditions being reported in the absence of the mitigation (albeit at new sensor locations) for the proposed Hotel, and some questionable target conditions being applied in the 2015 ES (including business walking on the residential podium).
- Images of the wind tunnel model suggest that the southeast corner of the Hotel may not fully represent the scheme submitted for approval. In particular, the submitted plans suggest that the L01 entrance is on the east elevation, rather than in the set-back corner modelled. The landscaping proposals also appear different to both the north and south of the Hotel.

**It is therefore recommended that the applicant provides further justification for the scenarios assessed, clarifies the details modelled for the Baseline scenario, provides further justification for the expected effectiveness of the Plot 4 and 5 mitigation, and clarifies any updates to the proposed Hotel Development (and their potential effects) implemented subsequent to the wind tunnel tests.**

In addition to this, and separate from the requirements for the proposed Hotel, LB Haringey may wish to seek clarification from the stadium developer regarding the wind mitigation strategy for the existing (2023) Site conditions.

The wind speed sensor locations and extent appear generally suitable around and to the north and east of the Hotel but does appear fairly limited to the south and west. For the assessment, the area further to the west and south is generally less critical due to the prevailing wind directions. Therefore, this may not be significant, but it does lead to some requested clarifications in subsequent sections of this review.

The approach to determine the atmospheric boundary layer profiles for the wind tunnel tests and for correction of the climate statistics to apply at the Site is standard and acceptable, though the climate data transposition factors are not stated. This information is commonly provided for detailed quantitative

assessments, but the details of the assumed terrain and applied methodology provided is adequate to conclude that the approach is acceptable. However, the target profile for the atmospheric boundary layer simulation presented in Figure B.1 of Appendix 16.1 appears to be for 337.5°, which is unlikely to represent a critical wind direction. **It is therefore recommended that the applicant provides further details of the atmospheric boundary layer simulation used, including the upper and lower bounds on the profiles for the full range of wind directions, against the profile simulated.**

The report confirms that 20 years of climate data from London Heathrow Airport has been applied. This is considered acceptable, though the legends are missing from the wind speed probability distributions presented in Figures B.2 to B.6 of Appendix 16.1 and **it is recommended that the applicant provides further details of the climate data applied.**

The pedestrian comfort and safety criteria applied is standard. Table 16.2 is missing some text from the third category. Assuming this should read 'For leisure uses excluding long periods of outdoor sitting, such as a park, children's play area, etc.', the seasonal targets are also considered appropriate (subject to clarifications on proposed uses discussed in subsequent sections of this review).

The significance criteria applied is considered appropriate. It is assumed that this is also applied to existing uses within the surrounding area, in addition to the stated planned activities (within the Site).

### **Baseline Conditions**

Existing conditions are assessed as being unsuitable in terms of pedestrian safety and comfort around the south and southeast side of the stadium. However, as discussed above, this may be in the absence of the wind mitigation measures committed to in the 2015 ES.

Otherwise, thoroughfares and entrances are expected to have suitable conditions for existing uses.

No existing amenity uses are considered or listed in Table 16.4: Summary of Receptors and Sensitivity, though the spill-out seating for the Beavertown Corner Pin pub is instrumented and the results suggest amenable conditions for outdoor seating during at least summer.

In addition to the receptors considered, it is recommended that **the applicant clarify the likely suitability of existing conditions for existing activities at the following additional receptors:**

- The Dare Skywalk;
- Podium level entrances and potential cafe outdoor seating for the Tottenham Experience;
- The playground of St Francis de Sales Junior School; and
- Commercial and residential entrances and private gardens along Park Lane.

## Completed Development

As discussed above, the effect of the completed Development within the interim context, omitting Plots 4 and 5, has not been assessed.

The effect of the completed Development in the context of the completed NDP masterplan and existing surrounds has been assessed without and with mitigation measures. Paragraph 16.4.2 is unclear as to whether the measures have been implemented, referring to them as both 'embedded' and 'over and above those agreed and implemented'. The measures appear generally appropriate and, from review of the planning drawings, it appears that the parapets and planters are included. However, the windbreak does not appear to be included on the L12 terrace and the L26 / L27 dividing screens cannot be discerned from the drawings. It is therefore recommended that **the applicant clarify which mitigation measures are included within the design submitted for approval and the proposed process for securing measures (or appropriate alternatives) not included at this stage.**

As a general comment, the assessment of pedestrian comfort is unclear in places and includes discrepancies in listed sensor locations between the ES chapter, the discussion in Appendix 16.1 and the figures in Appendix 16.1. In addition, there are several references to average exceedances of threshold wind speeds. In these cases, it is not clear what is being averaged, as this is not specified. Applying averages across a range of sensors is not standard practice (as the windier areas would still be noticeable to pedestrians and users) and can be misleading (unless area-weighted averaging is applied, the average would be heavily dependent on the numbers of sensors located within windier and calmer areas). There are also several discrepancies between the significance of effects stated in the discussion and in Table 16.5: Summary of Residual Effects.

For the completed Hotel Development in the context of the completed NDP masterplan, effects assessed as major beneficial (for pedestrian safety) and moderate beneficial (for pedestrian comfort) are reported around the south and southeast side of the stadium. Although in line with the significance criteria (which is considered appropriate), it should be noted that this is a combined effect of the Hotel, Plot 4 and Plot 5 and is relative to a Baseline which appears to omit wind mitigation measures accounted for within the 2015 ES for the current Site conditions.

For the proposed Hotel Development, in the absence of wind mitigation measures, conditions are assessed as unsuitable in terms of pedestrian / occupant safety at the northwest corner of the building and at the L12, L26 and L27 roof terraces. The wind mitigation measures, if implemented, are sufficient to mitigate these effects.

Further exceedances of the safety criteria are reported within Plot 5. The ES Addendum suggests that the mitigation developed for Plot 5 as part of the 2015 ES should be sufficient to mitigate these effects. However, this has not been verified with the proposed Hotel in place. The final mitigation measures will need to be developed during the detailed design stages for Plot 5 but, as discussed above, it is

recommended that further justification for the stated effectiveness of the preliminary Plot 5 mitigation measures be requested.

In terms of pedestrian comfort, several areas within the Site are assessed as suitable only for fast walking in winter and parts of the Plot 5 podium are assessed as uncomfortable for all uses. Again, it is suggested within the ES Addendum that the mitigation developed for Plots 4 and 5 as part of the 2015 ES should be sufficient to mitigate these effects. However, the updated results suggest windier conditions on the podium and accelerated winds extending across Worcester Avenue, and the effectiveness of the preliminary mitigation measures has not been verified with the proposed Hotel in place. This also applies to entrances and recreational spaces within Plots 4 and 5. As discussed above, the final mitigation measures will need to be developed during the detailed design stages for Plots 4 and 5 but it is recommended that further justification for the stated effectiveness of the preliminary Plot 4 and 5 mitigation measures be requested.

For areas to the south of the stadium where Baseline conditions are similar, conditions suitable only for fast walking in winter are assessed as of negligible significance, in line with the significance criteria. However, sensor location 72 along the east side of the Hotel has been included in this. In the absence of mitigation, this would more appropriately be assessed as a moderate adverse effect. With the mitigation introduced, residual conditions appear suitable for leisurely strolling, though it is not clear which elements of the wind mitigation create this improvement and **it is recommended that this be clarified by the applicant**, to ensure that these elements are implemented.

In the absence of wind mitigation measure, two of the Hotel entrances are assessed as too windy for pedestrian ingress / egress, though one of these is an emergency exit. The moderate and minor adverse significance are considered appropriate and these effects are alleviated by the proposed mitigation measures.

The proposed Development, in conjunction with Plots 4 and 5, has a beneficial effect on the stadium entrances, though the stated significance of effects is relative to the assessed Baseline which, as discussed above, appears to omit wind mitigation measures committed to in the 2015 ES. The widespread stated minor beneficial significance also appears to apply averaged exceedances and debatable ranges for marginal or tolerable conditions (we would not consider a 10% exceedance to be marginal).

At least parts of the proposed Development's northern, podium-level, terrace is assessed as too windy for long-term sitting in summer with or without the wind mitigation measures. The ES suggests that, in conjunction with the proposed mitigation, the outdoor seating will be focused in the calmer areas. Whilst this would normally be an acceptable form of mitigation for a larger space, the submitted plans do not appear to have applied this strategy, which may result in a very limited extent of seating.

The southern podium-level terrace appears to enjoy suitable conditions for proposed recreational uses (subject to the above requested clarifications on updates introduced subsequent to the wind tunnel tests).

The landscaped plaza on Park Lane does not appear to have been modelled and has been assessed for thoroughfare uses only. Reported conditions may be too windy for short periods of sitting, such as for a meeting point, at the benches for parts of the year.

The elevated amenity spaces are all assessed as requiring mitigation, but the assessed residual effects discussed in Paragraph 16.7.26 are unclear and are not consistent with the summary table, with spring conditions on the terraces apparently stated as both suitable and marginally windy.

In the absence of mitigation measures, part of the Hotel's L12 roof terrace is assessed as suitable only for fast walking during winter. The affected area is assessed as a thoroughfare, and this effect is assessed as minor adverse. We would not agree that a 9% exceedance, against a target of 5%, represents a marginal exceedance. The submitted plans also appear to show loungers in this area and does not appear to include any significant areas which could be considered as solely for pedestrian passage. Although winter conditions are not typically considered for amenity spaces, summer conditions appear too windy for sedentary recreational uses in the absence of the wind mitigation measures, and part of the wind mitigation strategy is not included in the submitted plans. It is not therefore obvious that residual conditions will be suitable for proposed recreational uses, as suggested in the summary table.

**It is therefore recommended that the applicant clarify the proposed usages of the amenity spaces, the wind mitigation measures implemented and the resulting suitability of wind conditions.**

The ES chapter indicates that the recessed balconies within the residential component of the proposed Hotel have been assessed through Computational Fluid Dynamics (CFD). Given the level of shelter to the balconies, the conclusion of acceptable conditions is considered plausible. However, **it is recommended that further details on the CFD studies and results be requested from the applicant.**

As discussed above, accelerated winds assessed as too windy for leisurely strolling in winter extend across Worcester Avenue but are expected to be resolved by the Plot 5 mitigation (not modelled). No other significant effects on surrounding conditions are identified.

The presented results suggest that further potential impacts to the west and south of the Site are unlikely, though the potential effects on the operations of The Dare Skywalk are less obvious. **It is therefore recommended that the likely effects at the additional receptors listed in the previous section are confirmed by applicant.**

## **Cumulative Effects**

Sensor location 65, to the south of the stadium, appears to deteriorate during winter with the introduction of the Lendlease scheme. However, this deterioration is likely to be marginal and the location was already assessed as unsuitable and dependent on the wider masterplan mitigation.

The ES conclusion that the introduction of future surrounding developments has no material effect on the assessed conditions in and around the Site is therefore considered plausible.



## Review Conclusions

The overall approach is considered appropriate and broadly in line with best practice, though a non-standard practice (in averaging exceedances of target threshold wind speeds) seems to have been applied in assessing the significance of some of the results.

The assessment scenarios include an updated Baseline, which appears to omit wind mitigation measures accounted for in the 2015 ES for the current phase, and omits the interim scenario comprising the completed Hotel in the absence of Plots 4 and 5, which appeared to represent the worst-case scenario for the consented Hotel in the 2015 ES. This makes a direct comparison of the effects of the proposed Hotel and the consented Hotel difficult. Summaries included in the NTS and Chapter 2 of the ES suggest a reduction in effects from moderate adverse to negligible, but the moderate adverse effects for the Consented scheme are understood to apply to the interim scenario, for which mitigation was not developed. The NTS then goes on to suggest that effects remain in line with the Consented scheme, which appears more appropriate. Some beneficial effects, ranging from major in terms of safety to moderate in terms of comfort, are also reported but this is relative to the updated Baseline which, as discussed above, appears to omit wind mitigation measures accounted for in the 2015 ES for the current phase and should therefore be treated with caution.

With the inclusion of designed-in mitigation, residual effects are assessed as generally negligible, though the discussion refers to minor adverse effects on the elevated amenity spaces which is not then listed in the summary table. Whilst plausible, these assessed residual effects do appear to depend on:

- Mitigation measures which may not be included within the scheme submitted for approval;
- Limited uses of recreational spaces (particularly outdoor seating) which may not be in line with those illustrated in the plans submitted for approval; and
- Mitigation developed in the 2015 ES for Plots 4 and 5 being similarly effective with the proposed Hotel introduced, though this has not been verified as part of the wind tunnel studies.

These potential issues are included in the recommended list of clarifications on the following page.

It is recommended that clarifications are requested from the applicant as follows:

1. provide further justification for the scenarios assessed;
2. clarify the details modelled for the Baseline scenario;
3. provide further details of the atmospheric boundary layer simulation used;
4. provide further details of the climate data applied (Figures B.2 to B.6);
5. clarify any updates to the proposed Hotel Development (and their potential effects) implemented subsequent to the wind tunnel tests;
6. provide further justification for the stated effectiveness of the preliminary Plot 4 and 5 mitigation;
7. clarify existing and proposed conditions at the following further sensitive surrounding receptors:
  - The Dare Skywalk;
  - Podium level entrances and potential café outdoor seating for the Tottenham Experience;
  - The playground of St Francis de Sales Junior School; and
  - Commercial and residential entrances and private gardens along Park Lane.
8. clarify the proposed usages of the proposed Hotel amenity spaces, the wind mitigation measures implemented and the resulting suitability of wind conditions;
9. clarify the proposed process for securing any required mitigation measures (or appropriate alternatives) not included in the design submitted for approval;
10. clarify which elements of the wind mitigation create the improvement on the east side of the Hotel (sensor location 72); and
11. provide further details of the CFD studies carried out to assess the private balconies.

Yours sincerely,



**Dr Graeme Flynn**  
**Director**  
**Urban Microclimate Limited**

9<sup>th</sup> November 2023

Hannah Cox,  
Senior Planner,  
Quod.

Dear Hannah,

**Northumberland Development Project – Section 73 Application  
Wind Microclimate ES Addendum Review**

The Northumberland Development Project (NDP) Section 73 Application (Ref. HGY/2023/213) was submitted in July 2023, with a wind microclimate assessment presented in Chapter 16 of an ES Addendum submitted in July 2023 (July 2023 ES Addendum). A comprehensive review of the ES Addendum and associated Technical Appendix has been undertaken by Urban Microclimate Limited, and having reviewed the various considered requests for clarification in conjunction with the ES Addendum and Appendix prepared by our team, I am pleased to be able to respond herein.

As you are aware, since submission of the July 2023 ES Addendum, further amendments to the design have been made. These amendments have been assessed separately and the findings have been summarised in a Wind Microclimate ES Addendum Update, submitted as part of the Environmental Statement Addendum Update Note on 31<sup>st</sup> October 2023. Where appropriate, responses provided herein refer to this recent submission and its findings.

Details of the methodology employed for early stage CFD are presented herein. This methodology has also been employed for other areas where CFD has been utilised. This includes the preparation of supplementary material provided as part of this response document and as part of the ES Addendum Supplementary Note.

Yours Sincerely,



Dr Robin Stanfield  
**Director**  
**Architectural Aerodynamics**

Summary Requests for Clarification	Detailed Commentary / Clarification Request	Clarification
<p>It is recommended that the applicant provides further justification for the scenarios assessed, clarifies the details modelled for the Baseline scenario, provides further justification for the expected effectiveness of the Plot 4 and 5 mitigation, and clarifies any updates to the proposed Hotel Development (and their potential effects) implemented subsequent to the wind tunnel tests.</p>	<p>Available images of the wind tunnel model suggest that all existing landscaping within the Site may not have been modelled. In particular, trees around the southeast side of the stadium formed part of the wind mitigation scheme developed in the 2015 ES but do not appear to have been modelled.</p>	<p>The observation is accurate, some elements of landscaping and mitigation were not modelled. Early within the studies, it became apparent that some landscape elements that form part of the Consented Scheme are yet to be introduced as the other phases of the consent are yet to be constructed and / or fully implemented. This includes 10-metre-tall trees mounted within 1-metre-tall planters, 50% solid screens on the ground and 6-metre-high, 2-metre-deep solid screens mounted to the stadium façade, above ground. Without any certainty that these elements would be introduced in the near future through delivery of other phases or discharge of condition(s), they were omitted purposefully to reflect the current baseline condition, i.e. 2023.</p>
	<p>It is also unclear if the further mitigation measures committed to in the 2015 ES, including further trees in the central areas of the podium, solid signs hanging from the southeast facade of the stadium and porous screens extending out from south and east facades of the stadium, have not been implemented or are potentially just omitted from the model. It is also unclear if the stepped geometry of the stadium façade, which may have localised benefits at some entrances, has been modelled. As a result, the assessed Baseline conditions may be overly conservative which, in turn, may exaggerate the reported beneficial effects of the completed Development.</p>	<p>The omission of the trees to the southeast side of the stadium was made consciously, essentially as an extension of the approach adopted in relation to the absent 'construction phase' measures. Had they been modelled, it is probable that baseline conditions at location 41 would meet the safety criteria, while conditions at locations 38, 39 and 42 would be suitable for strolling.</p> <p>The stadium façade was modelled to an appropriate degree of detail, with some simplification. Recessed entrance zones were not modelled, though this is understood to be consistent with the wind tunnel model constructed in 2015. It is possible that conditions at entrances could be improved, through modelling of recessed entrances but less likely that they (nor the space immediately adjacent) would be improved to the extent that they become suitable for entrance use / waiting / queuing, while the effect of any simplification on conditions further from the façade is expected to be realistically minor.</p>
	<p>The 2015 ES assessed an interim scenario comprising the completed Hotel development in the absence of the Plots 4 and 5. This appeared to represent the worst case for the consented Hotel, and the EIA Context Overview presented in Paragraph 16.2.2 appears to at least partially reference this scenario. No justification for omitting this scenario for the proposed Hotel has been provided.</p>	<p>The Consented Scheme comprises planning consent for construction of Plots 3, 4, 5 and 6 (alongside the now complete elements of the Stadium and Tottenham Experience). As such, it is entirely reasonable at this stage to consider the revisions to the Plot 3 Hotel in the context of the consented massing of Plots 4 - 6. The multiple interim scenarios provided in the 2015 ES provided sensitivity tests of short windows and are not reflective of the Consented Scheme or proposed S.73 amendments to it, which still comprise the construction of remaining phases. It is not considered necessary to retest this interim scenario in this context.</p>
	<p>The effectiveness of the preliminary wind mitigation measures developed for Plots 4 and 5, and accounted for within the 2015 ES, has not been verified with the proposed Hotel introduced in place of the consented Hotel. This is despite worse conditions being reported in the absence of the mitigation (albeit at new sensor locations) for the proposed Hotel, and some questionable target conditions being applied in the 2015 ES (including business walking on the residential podium).</p>	<p>In the early stages of the July '23 studies CFD modelling was carried out. This was primarily to facilitate early exploration of mitigation measures in the elevated spaces of the Plot 3 Hotel in advance of the wind tunnel test. An advantage of this exercise was that it provided a better understanding of worst-case regions of windiness throughout the southern podium area, and in particular, between the consented Plot 5 towers. This allowed better placement of measurement locations (relative to the 2015 study) and the associated capture of conditions that were not previously picked up.</p> <p>The assessment did not seek to re-verify the effectiveness of the mitigation for Plots 4 &amp; 5. The original assessment carried out in 2015 was able to demonstrate that conditions could be plausibly mitigated. The 2023 assessment suggests that mitigation may need to be more substantial than that developed in 2015, but with this just comprising deciduous trees and hedge planting in its preliminary guise, it should remain possible to develop an effective mitigation strategy. This will be refined at a subsequent reserved matters stage.</p> <p>Lastly, results captured over the course of the studies indicate two important aspects. Firstly, wind tunnel results show that conditions within Plot 5 are substantially driven by winds from southerly and south-westerly sectors (90% of winds contributing to safety exceedances within Plot 5), and considerably less so from west and west-southwest. Secondly, a sensitivity exercise carried out in CFD indicates that the Plot 3 Hotel has a marginally favourable effect on conditions in this southeastern part of the podium, providing some shelter for these less influential sectors from west and west-southwest. Correspondingly, conditions in this area are broadly unaffected by the Plot 3 Hotel, in either its consented or proposed forms, but if anything, they are marginally improved by its presence.</p>
	<p>Images of the wind tunnel model suggest that the southeast corner of the Hotel may not fully represent the scheme submitted for approval. In particular, the submitted plans suggest that the L01 entrance is on the east elevation, rather than in the set-back corner modelled. The landscaping proposals also appear different to both the north and south of the Hotel.</p>	<p>Following submission of the July 2023 ES Addendum, further amendments to the design have been made, including the entrance to Level 01 is on the east elevation, as observed. This entrance is located within one of the most benign parts of the Plot 3 Hotel Site where conditions are suitable for short-term standing / sitting or better throughout the year. As a result, the relocation of this entrance will see it move from an area with acceptable conditions to one with equally acceptable conditions.</p> <p>At the time that wind tunnel testing was carried out in July 2023, an exact understanding of tree planting within the public realm at street level south of the Plot 3 Hotel was unconfirmed, and correspondingly at the time when modelling took place this was omitted. The effect of trees in this vicinity would be to modestly enhance conditions as reported.</p>

		The changes to the landscaping to the north of the Plot 3 Hotel are addressed within the recently prepared ES Addendum Update Note. This specifically addresses the removal of a planter from north-western corner of podium terrace, which while present within the design for the July 2023 ES Addendum, was removed from the final submitted Section 73 application planning drawings, given the impact on available space for tables and chairs. This being the case, the terrace will be remain suitable for access and passage. The area of seating by the northern façade will be suitable for long-term sitting during summer and autumn, representing a negligible residual effect. Elsewhere with the removal of the planter, conditions are expected to meet the threshold wind speed for long-term sitting 80-90% of the time, depending on location. This represents a moderate adverse residual effect.
It is recommended that the applicant provides further details of the atmospheric boundary layer simulation used, including the upper and lower bounds on the profiles for the full range of wind directions, against the profile simulated.	The target profile for the atmospheric boundary layer simulation presented in Figure B.1 of Appendix 16.1 appears to be for 337.5°, which is unlikely to represent a critical wind direction.	Please see Figure 1 for a full suite of directional profiles.  The range of wind speed and turbulence profiles across all angles are sufficiently similar that they can be represented by a single wind tunnel profile. The selected angle is considered to be representative, with all profiles being reasonably represented by the measured wind tunnel profile up to and just beyond the reference height. At the lower end of the height range, where the agreement falls away, the profile will be corrected by the detailed proximity model.
The report confirms that 20 years of climate data from London Heathrow Airport has been applied. This is considered acceptable, though the legends are missing from the wind speed probability distributions presented in Figures B.2 to B.6 of Appendix 16.1 and it is recommended that the applicant provides further details of the climate data applied.		Please see Figure 2 for updated wind rose illustrations at reference height at site.
It is recommended that the applicant clarify the likely suitability of existing conditions for existing activities at the following additional receptors:	The Dare Skywalk	Please see Figure 3 that presents baseline (existing site, existing surrounds) summertime CFD comfort contours for the Dare Skywalk, summer being the period during the year when the experience would primarily be used.  Baseline conditions around the Dare Skywalk are predicted to be substantially suitable for strolling in summer, with a region towards the edge where conditions spill into the fast-walking classification.
	Podium level entrances and potential cafe outdoor seating for the Tottenham Experience	Please see Figures 4 and 5 that present baseline CFD contours for the Plot 4 Tottenham Hotspur Experience.  Entrance conditions are suitable for short-term standing / sitting in the worst season and thus suitable for ingress / egress. This includes the entrance to the Dare Skywalk reception (the northernmost entrance) which is recessed behind the building line.  It is understood that potential café seating refers to the roof to the north of Warmington House. Here conditions are predicted to be suitable for short-term standing year-round and for long-term sitting in summer.
	The playground of St Francis de Sales Junior School	Please see Figure 6 that presents baseline worst seasonal CFD comfort contours for the school playground.  Baseline conditions are suitable for a mixture of short-term and long-term standing / sitting throughout the year and are correspondingly suitable for a general / active recreational area such as a school playground.
	Commercial and residential entrances and private gardens along Park Lane.	The wind tunnel results appear to provide an adequate characterisation of wind conditions along the south side of Park Lane. Nevertheless, please see Figure 7 baseline worst seasonal CFD comfort contours for this area.  Conditions at the front of properties along Park Lane are suitable for short-term standing or better in the worst-season. Private outdoor spaces to the front of residential properties along Park Lane are evidently more for access and storage (principally for waste bins). Private gardens to the rear of these properties are substantially suitable for long-term sitting in the worst-season, and of course better in other seasons.
It is recommended that the applicant clarify which mitigation measures are included within the design submitted for approval and the proposed process for securing measures (or	The effect of the completed Development in the context of the completed NDP masterplan and existing surrounds has been assessed without and with mitigation measures. Paragraph 16.4.2 is unclear as to whether the measures have been implemented, referring to them as both 'embedded' and 'over and above those agreed and implemented'. The measures appear generally appropriate and, from review of the planning drawings, it appears that the parapets and planters are	Since submission of the July 2023 ES Addendum, further amendments to the design have been made. These amendments have been assessed separately and the findings have been summarised in a Wind Microclimate ES Addendum Update. The following (paraphrased & further supplemented here) has been concluded:  - It is understood that the wind break on the Level 13 amenity terrace (as presented within the updated design following further refinements) is removed. This being the case, and accounting for other

<p>appropriate alternatives) not included at this stage.</p>	<p>included. However, the windbreak does not appear to be included on the L12 terrace and the L26 / L27 dividing screens cannot be discerned from the drawings.</p>	<p>changes, conditions are still expected to be suitable for short-term sitting from spring to autumn, and thus suitable for a general amenity space, where so this represents a negligible residual effect. With this terrace now showing tables and chairs throughout much of the area, and with the re-arranged orientation of the pool, and associated rotation of the column of sun loungers, conditions remain suitable for short-term standing / sitting from spring to autumn. This represents a moderate adverse residual effect.</p> <ul style="list-style-type: none"> <li>- Privacy screens and balustrades have been incorporated into what are now terraces on Levels 27 to 29. These spaces are broadly suitable for short-term standing / sitting from spring to autumn (negligible residual effect), still with the exception of part of the northernmost terrace (Level 29) where conditions spill into the strolling category (moderate adverse effect).</li> </ul>
<p>It is recommended that further justification for the stated effectiveness of the preliminary Plot 5 mitigation measures be requested.</p>	<p>Further exceedances of the safety criteria are reported within Plot 5. The ES Addendum suggests that the mitigation developed for Plot 5 as part of the 2015 ES should be sufficient to mitigate these effects. However, this has not been verified with the proposed Hotel in place. The final mitigation measures will need to be developed during the detailed design stages for Plot 5 but it is recommended that further justification for the stated effectiveness of the preliminary Plot 5 mitigation measures be requested.</p>	<p>Please refer to prior clarification in connection with Plot 5 mitigation measures.</p>
<p>For areas to the south of the stadium where Baseline conditions are similar, conditions suitable only for fast walking in winter are assessed as of negligible significance, in line with the significance criteria. However, sensor location 72 along the east side of the Hotel has been included in this. In the absence of mitigation, this would more appropriately be assessed as a moderate adverse effect. With the mitigation introduced, residual conditions appear suitable for leisurely strolling, though it is not clear which elements of the wind mitigation create this improvement and it is recommended that this be clarified by the applicant, to ensure that these elements are implemented.</p>		<p>With the completed Development in place with and without mitigation at location 72, 8 m/s is exceeded 5.0% ± 0.1% of the time, i.e. there is a very marginal difference between mitigated and unmitigated scenarios.</p> <p>In principle this difference could be a result of the three successive planters slowing wind as it travels around the north of the hotel, before recirculating in the region of location 72. In practice, this is equally likely (probably more so) to be reflective of experimental uncertainty. Either way, with exceedance of strolling conditions being so slight and practically imperceptible, any effect (residual or otherwise) would be arguably negligible and minor at worst.</p>
<p>It is recommended that the applicant clarify the proposed usages of the amenity spaces, the wind mitigation measures implemented and the resulting suitability of wind conditions.</p>	<p>At least parts of the proposed Development's northern, podium-level, terrace is assessed as too windy for long-term sitting in summer with or without the wind mitigation measures. The ES suggests that, in conjunction with the proposed mitigation, the outdoor seating will be focused in the calmer areas. Whilst this would normally be an acceptable form of mitigation for a larger space, the submitted plans do not appear to have applied this strategy, which may result in a very limited extent of seating.</p> <p>The landscaped plaza on Park Lane does not appear to have been modelled and has been assessed for thoroughfare uses only. Reported conditions may be too windy for short periods of sitting, such as for a meeting point, at the benches for parts of the year.</p> <p>The elevated amenity spaces are all assessed as requiring mitigation, but the assessed residual effects discussed in Paragraph 16.7.26 are unclear and are not consistent with the summary table, with spring conditions on the terraces apparently stated as both suitable and marginally windy.</p>	<p>Please refer to prior clarification in connection with the revisions to the northern seating terrace and its associated suitability.</p> <p>Please see Figure 7 that presents CFD results for Park Lane south, including the public realm at street level south of the hotel. This illustrates a region substantially coincident with the public realm area outside the hotel that is predicted to be suitable for short-term standing / sitting in the worst-season, a region whose conditions will improve in other seasons of the year. This CFD-based finding corresponds well with wind tunnel results and confirms that this area would be suitable for general recreational purposes (negligible effect).</p> <p>Since submission of the July 2023 ES Addendum, further amendments to the design have been made. These amendments have been assessed separately and the findings have been summarised in a Wind Microclimate ES Addendum Update. Please refer to that document or alternately appropriate responses herein concerning the Level 13 southern terrace and the Levels 27 – 29 private terraces.</p> <p>The Level 14 northern terrace is substantially suitable for short-term standing spring to autumn. As a general amenity terrace these conditions would be acceptable, and the effect is considered negligible. Planning submission drawings following the further design refinements indicate four small tables and chairs along the</p>

		<p>east facing façade. Here conditions would be too windy for outdoor seating, and this would represent a moderate adverse effect. However, it is understood that there is some flexibility in the number and position of these tables, and they could be positioned further round to the northwest corner of the terrace where conditions are suitable for long-term sitting from spring to autumn. Located in this position, the associated effect would be negligible.</p>
	<p>In the absence of mitigation measures, part of the Hotel's L12 roof terrace is assessed as suitable only for fast walking during winter. The affected area is assessed as a thoroughfare, and this effect is assessed as minor adverse. We would not agree that a 9% exceedance, against a target of 5%, represents a marginal exceedance. The submitted plans also appear to show loungers in this area and does not appear to include any significant areas which could be considered as solely for pedestrian passage. Although winter conditions are not typically considered for amenity spaces, summer conditions appear too windy for sedentary recreational uses in the absence of the wind mitigation measures, and part of the wind mitigation strategy is not included in the submitted plans. It is not therefore obvious that residual conditions will be suitable for proposed recreational uses, as suggested in the summary table.</p>	<p>Since submission of the July 2023 ES Addendum, further amendments to the design have been made. These amendments have been assessed separately and the findings have been summarised in a Wind Microclimate ES Addendum Update. The following (paraphrased &amp; further supplemented here) has been concluded therein:</p> <ul style="list-style-type: none"> <li>- It is understood that the wind break on the Level 13 amenity terrace (as it is now) is removed. This being the case, and accounting for other changes, conditions are still expected to be suitable for short-term sitting from spring to autumn, and thus suitable for a general amenity space, where so this represents a negligible residual effect. With this terrace now showing tables and chairs throughout much of the area, and with the re-arranged orientation of the pool, associated rotation of the column of sun loungers, conditions suitable for short-term standing / sitting from spring to autumn represent a moderate adverse residual effect.</li> </ul>
<p>The ES chapter indicates that the recessed balconies within the residential component of the proposed Hotel have been assessed through Computational Fluid Dynamics (CFD). Given the level of shelter to the balconies, the conclusion of acceptable conditions is considered plausible. However, it is recommended that further details on the CFD studies and results be requested from the applicant.</p>		<p>Please see Figure 8 for predictions of worst-seasonal balcony comfort. Balconies are predicted to be substantially suitable for long-term sitting year-round, suitable for at least short-term sitting year-round, and correspondingly suitable for long-term sitting during summer.</p>
<p>The presented results suggest that further potential impacts to the west and south of the Site are unlikely, though the potential effects on the operations of The Dare Skywalk are less obvious. It is therefore recommended that the likely effects at the additional receptors listed in the previous section are confirmed by applicant.</p>	<p>The Dare Skywalk</p>	<p>Please see Figure 3 that presents summertime CFD comfort contours for the Dare Skywalk with the complete NDP development in place.</p> <p>As Figure 3 indicates conditions around the Dare Skywalk are predicted to be substantially suitable for strolling in summer upon introduction of the development, including the Plot 3 hotel, with the region suitable for fast-walking reduced in size.</p> <p>This represents a marginal improvement to conditions following the introduction of the completed development, and thus a minor beneficial effect.</p>
	<p>Podium level entrances and potential cafe outdoor seating for the Tottenham Experience</p>	<p>Please see Figures 4 &amp; 5 that present CFD contours for the Plot 4 Tottenham Hotspur Experience.</p> <p>Entrance conditions are suitable for short-term standing / sitting in the worst season and are suitable for ingress / egress. This includes the entrance to the Dare Skywalk reception (the northernmost entrance) which is recessed behind the building line. This represents a negligible effect.</p> <p>It is understood that potential café seating refers to the roof to the north of Warmington House. The wind conditions here and in the occasional event space rooftop further north are predicted to remain suitable for short-term standing in the worst season and for long-term sitting in summer.</p>
	<p>The playground of St Francis de Sales Junior School</p>	<p>Please see Figure 6 that presents worst-seasonal CFD comfort contours for the school playground for the completed Development.</p> <p>Conditions are suitable for a mixture of short-term and long-term standing / sitting throughout the year and are correspondingly suitable for a general / active recreational area such as a school playground. Relative to the baseline scenario, the suitability of the playground is materially the same. This represents a negligible effect of the Completed Development.</p>
	<p>Commercial and residential entrances and private gardens along Park Lane</p>	<p>Please see Figure 7 for worst seasonal CFD comfort contours for this area, and please also refer to the wind tunnel results.</p>

		<p>For the completed Development, conditions at the immediate frontage of properties along Park Lane are predicted to be suitable for short-term standing or better in the worst-season, this without the presence of the numerous private residential boundary walls and fences that would serve to locally slow wind travelling along Park Lane. Private gardens to the rear of the properties continue to be substantially suitable for long-term sitting in the worst-season, and of course better in other seasons. This represents a negligible effect of the completed Development.</p>
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Figure 1 – Mean wind speed and turbulence profiles, all wind directions, 22.5-degree increments.

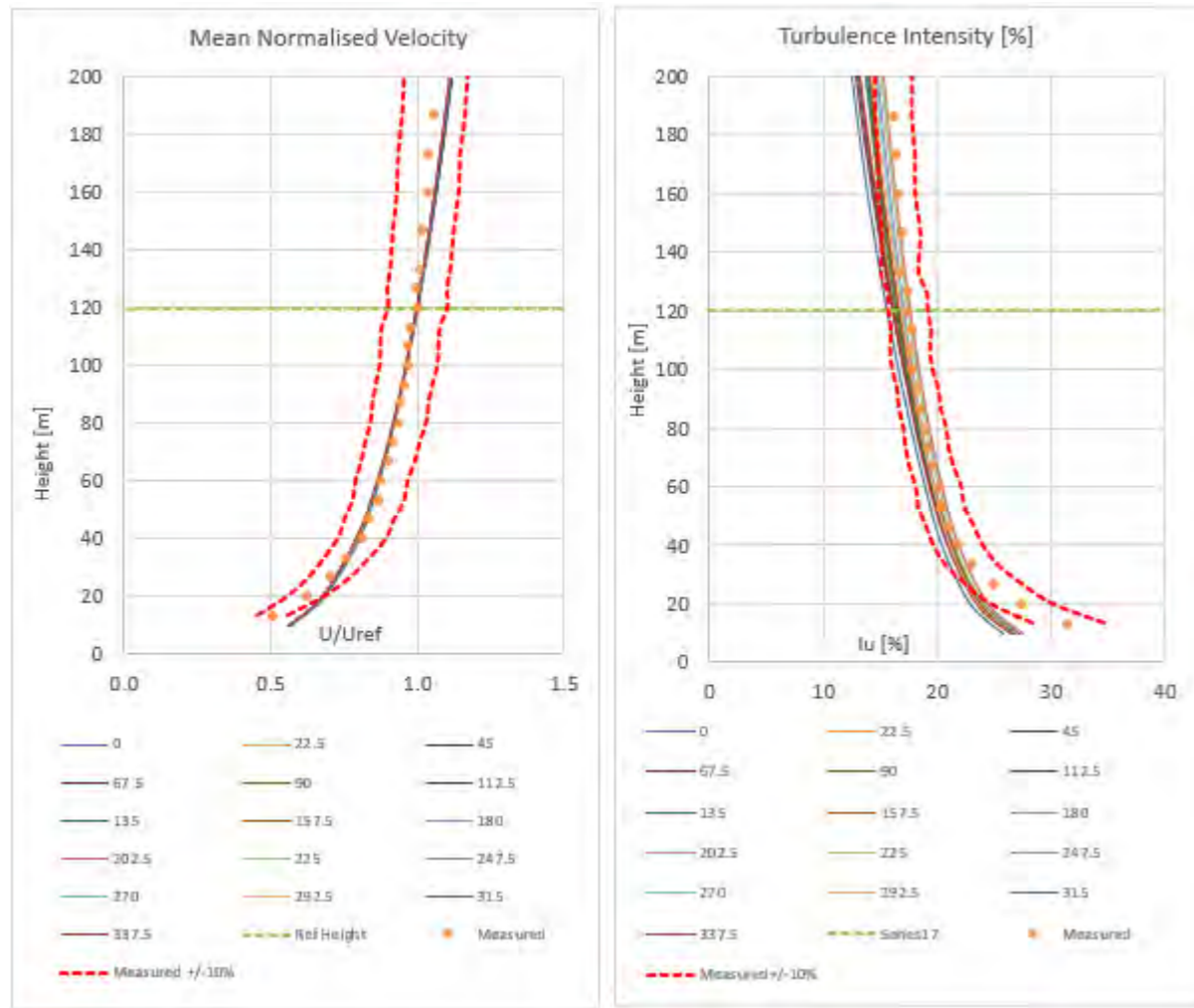


Figure 2 – Annual and seasonal wind roses.



Figure 3 – Dare Skywalk, CFD predictions of summertime comfort.

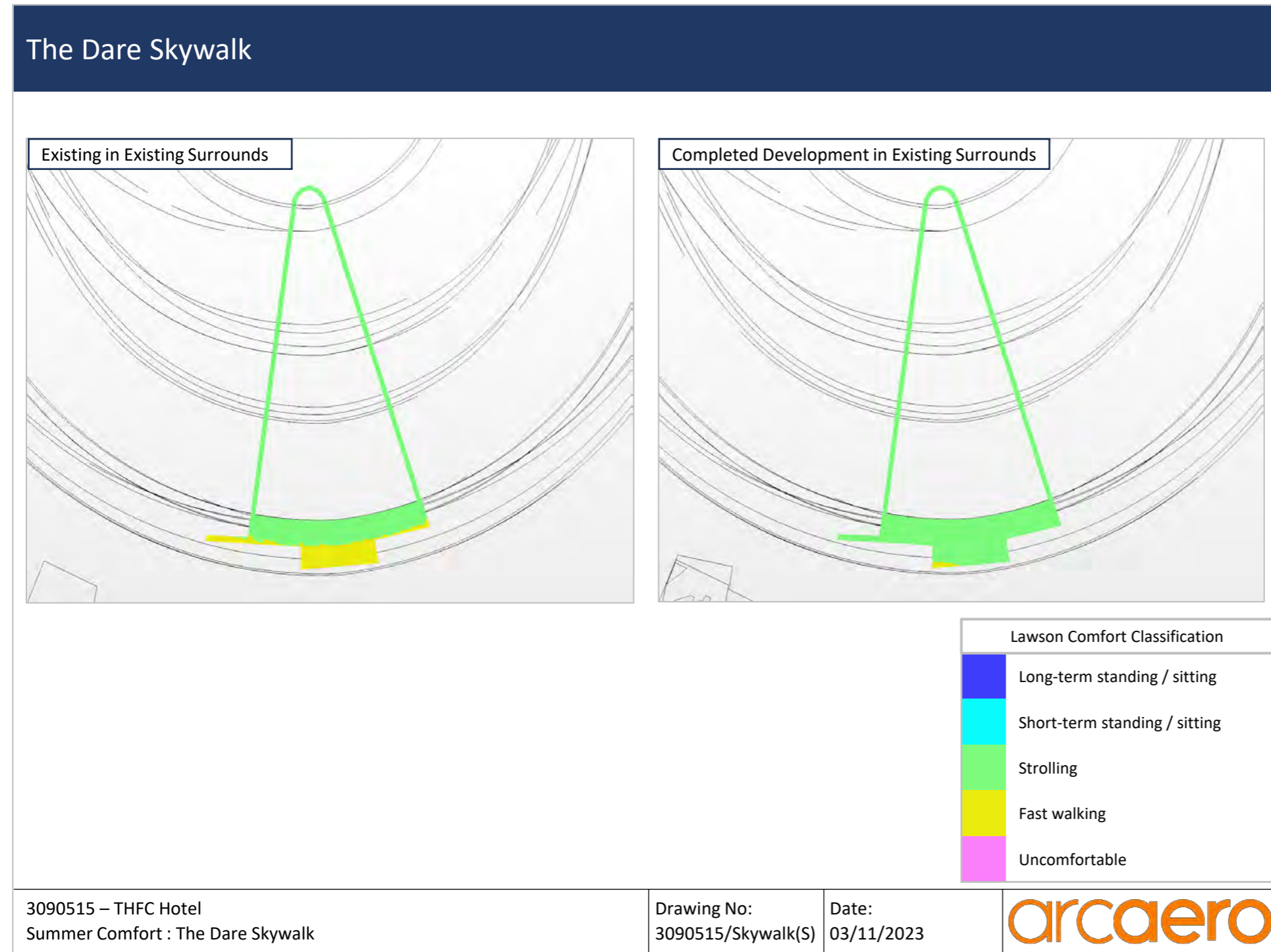


Figure 4 – Tottenham Hotspur Experience, CFD predictions of worst-seasonal and summertime comfort.

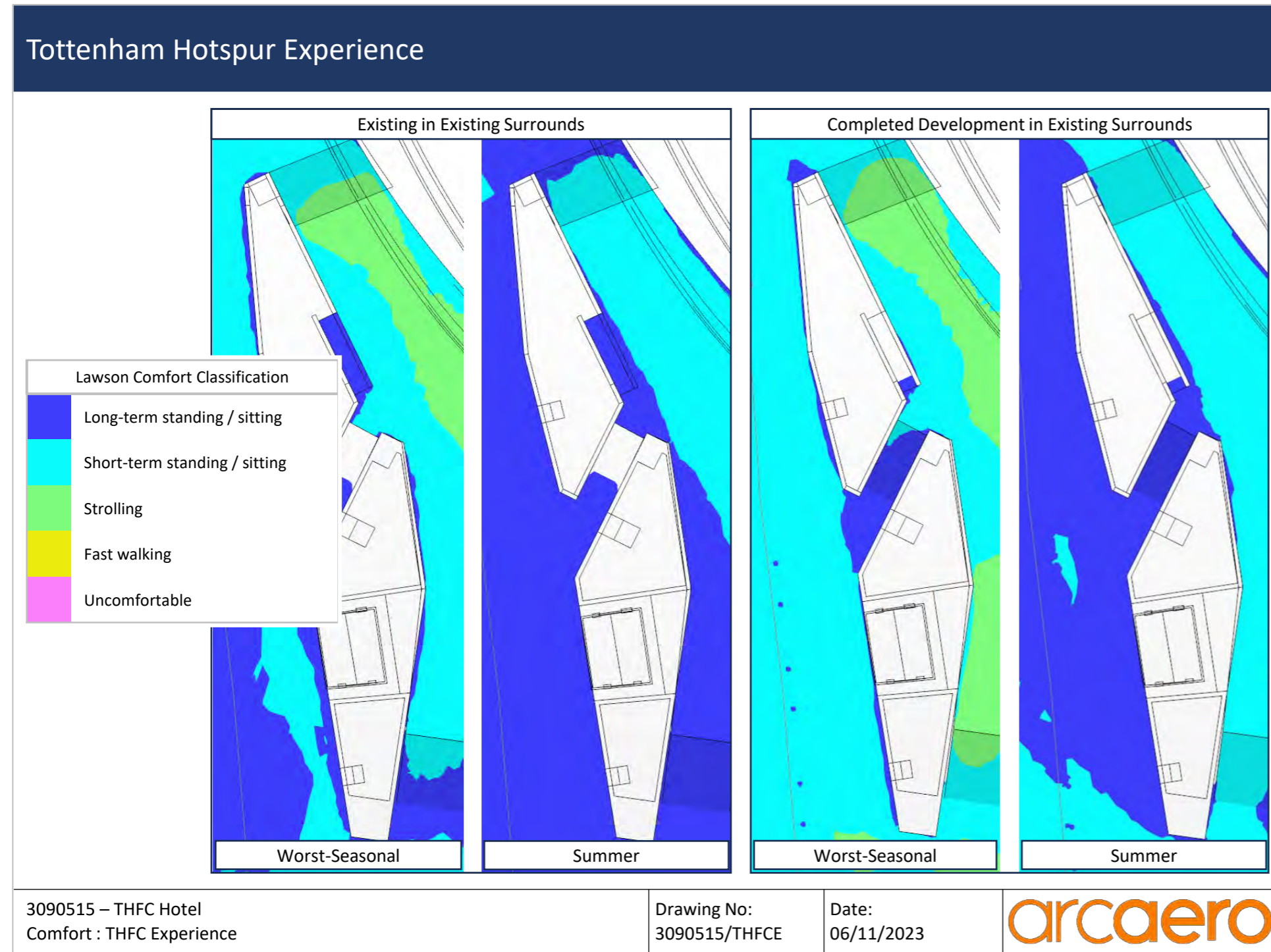


Figure 5 – Tottenham Hotspur Experience, CFD predictions of worst-seasonal comfort within the playground of St Francis de Sales Junior School.

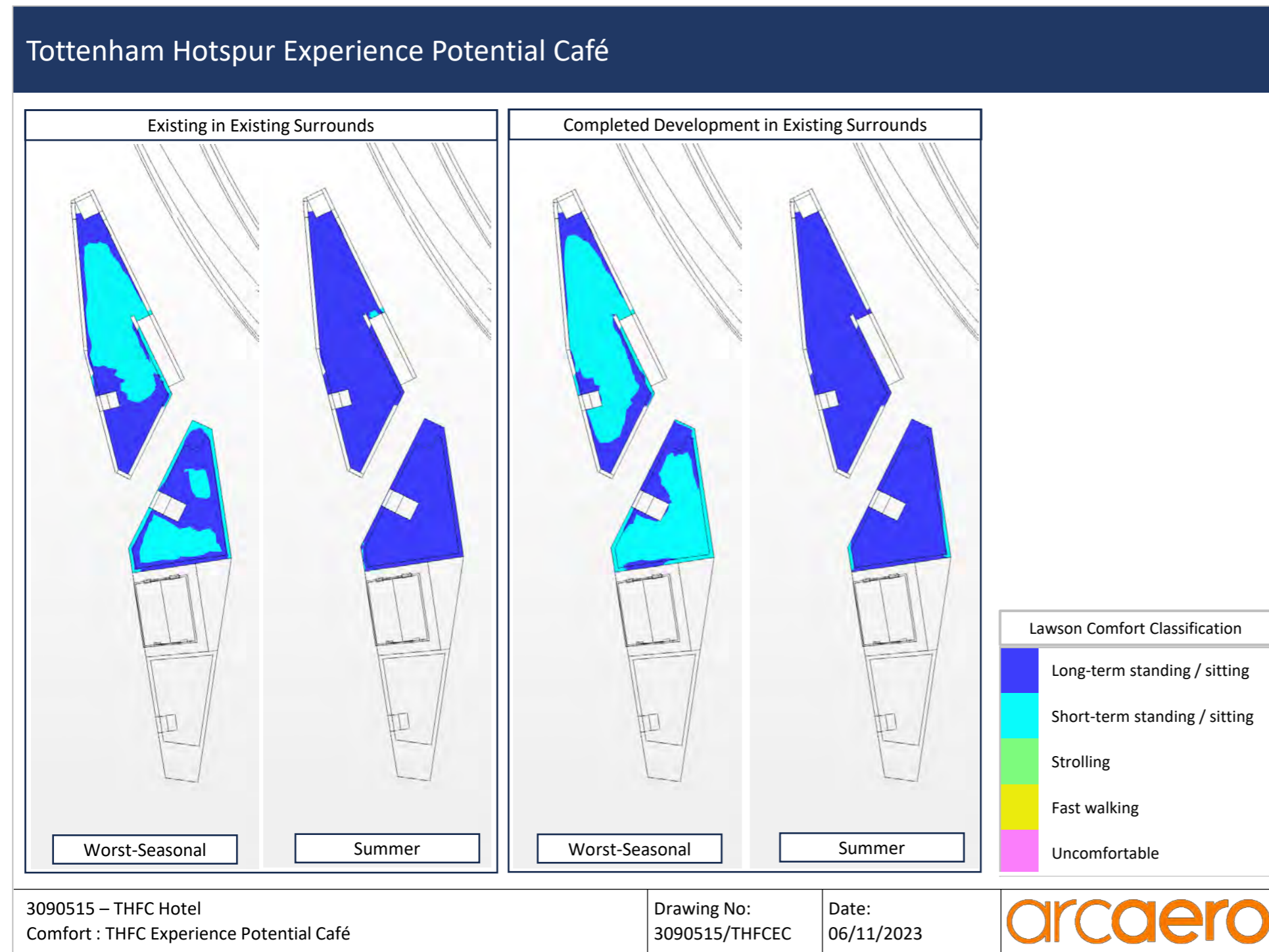


Figure 6 – CFD predictions of worst-seasonal comfort within the playground of St Francis de Sales Junior School.

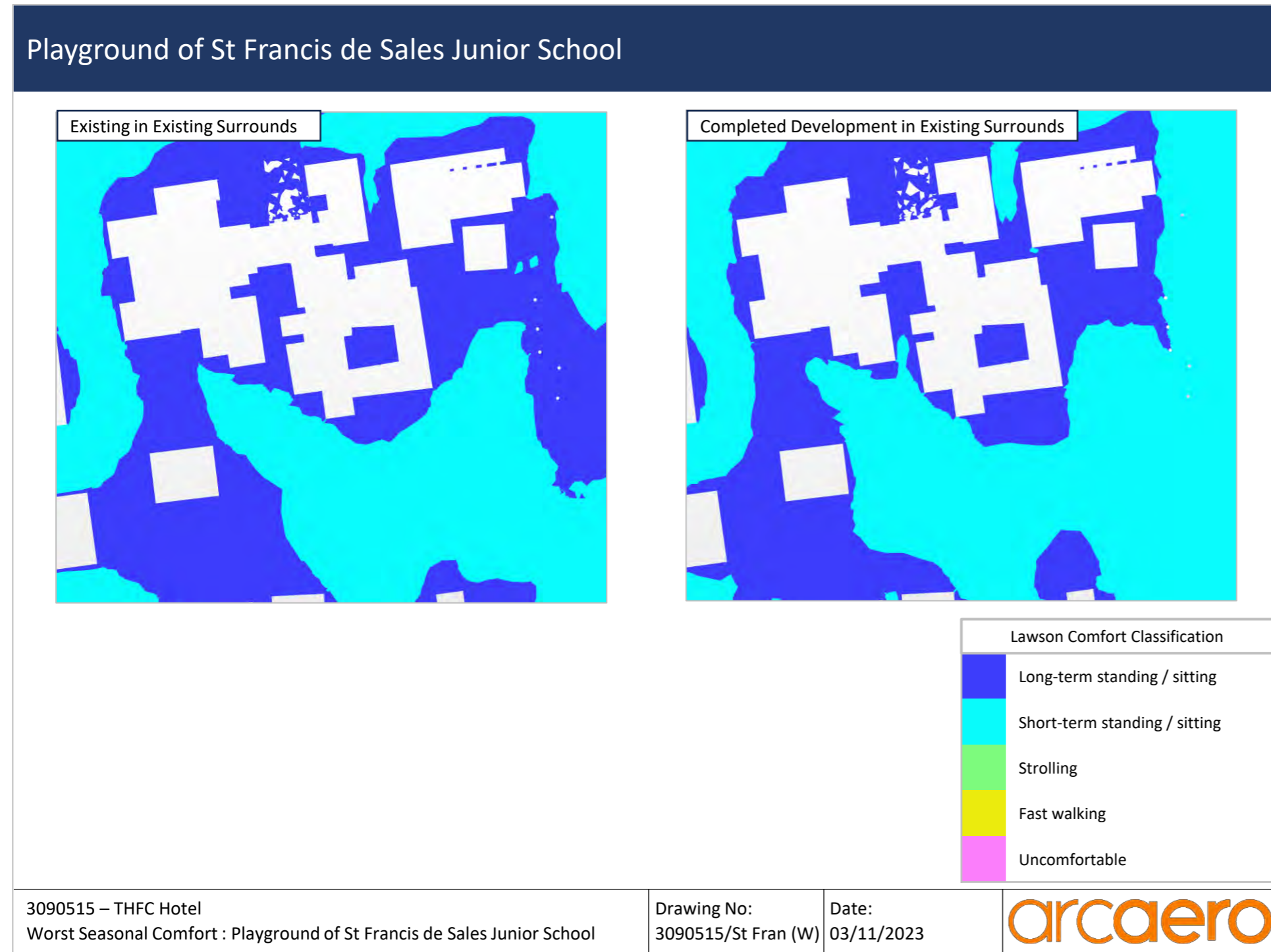


Figure 7 – Park Lane south, CFD predictions of worst-seasonal comfort

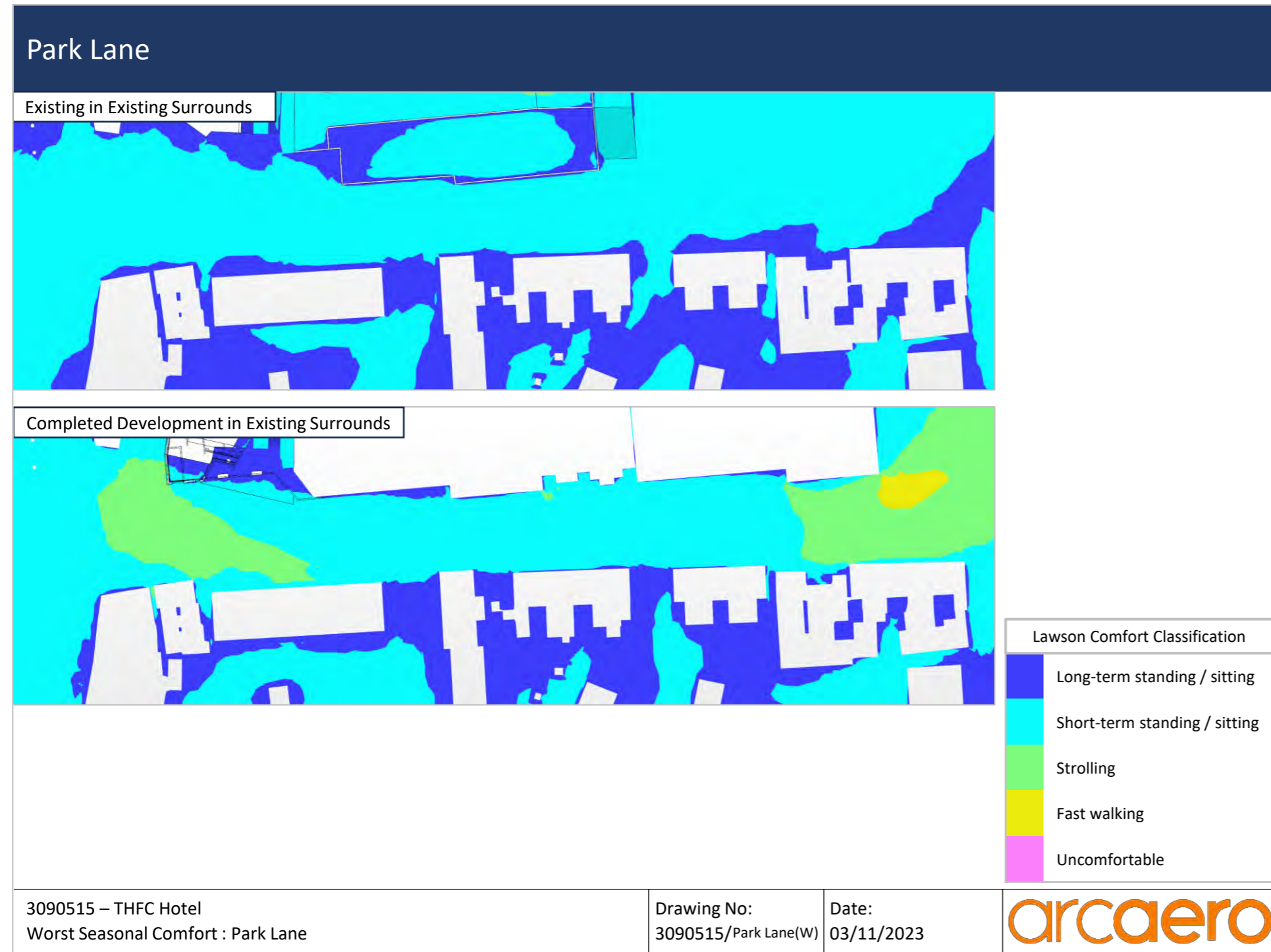
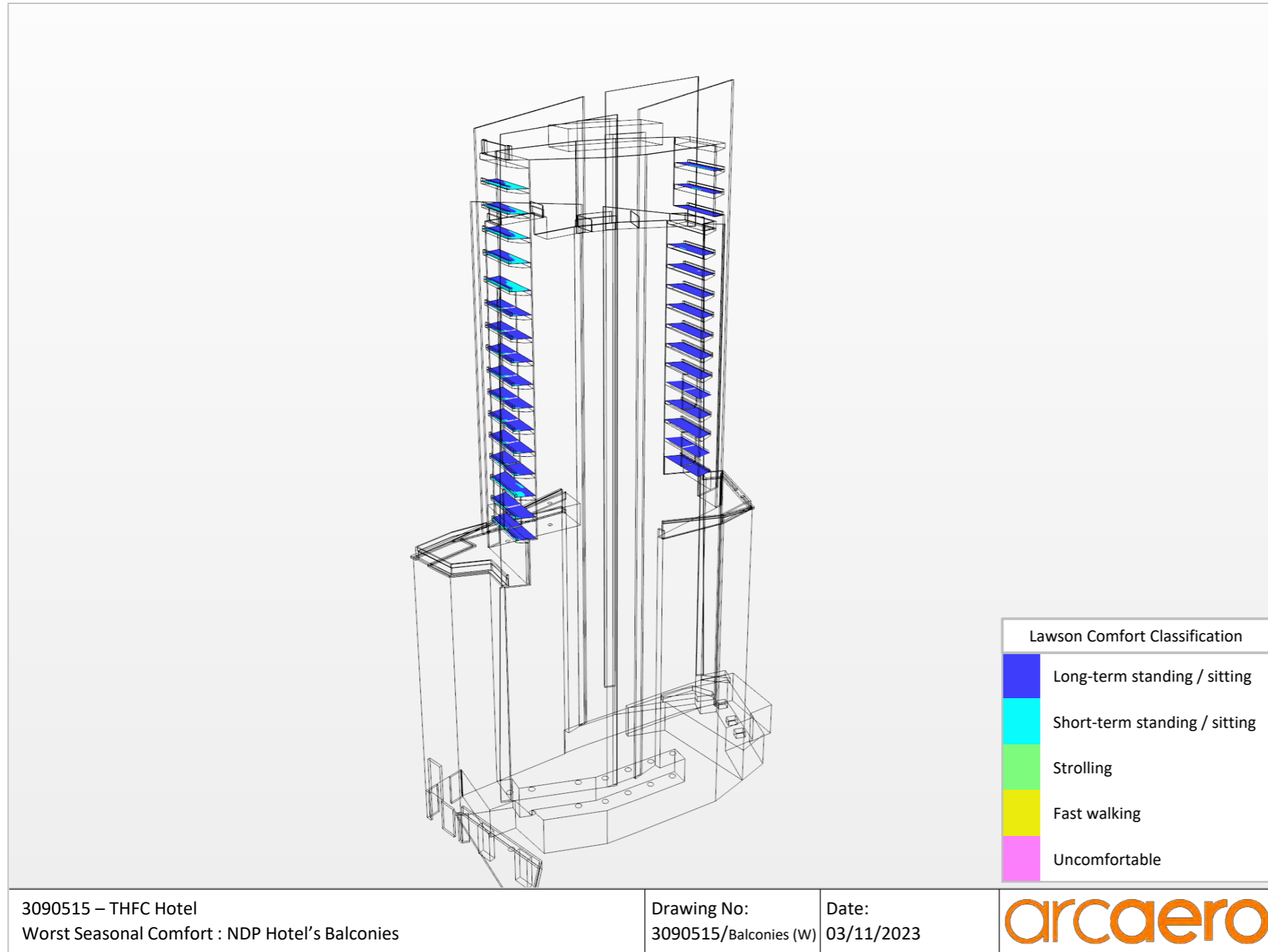


Figure 8 – Balconies, CFD predictions of worst-seasonal comfort



3090515 – THFC Hotel  
 Worst Seasonal Comfort : NDP Hotel's Balconies

Drawing No: 3090515/Balconies (W)  
 Date: 03/11/2023



## Assessment Methodology

### Overview

CFD modelling has employed a steady-state RANS approach. This method employs turbulence models to approximate the magnitude of velocity fluctuations about the average wind speeds predicted, in order to derive an estimation of the effect of gusts.

Salient highlights of this approach are:

- the Shear Stress Transport k- $\omega$  turbulence model has been employed.
- Architectural features of 0.5 metres or more have been captured within the geometry modelled.
- Cell sizes of as small as 0.2 metres were utilised to capture flow behaviour in critical locations.
- The region of interest closest to the ground (1.5 metres) incorporated 5 layers of cells.

### Computational Model

A digital model of the site and surrounds was used for the study. The surrounding area was modelled up to a distance of 600 m and all features which are likely to impact the wind flow to and through the site have been replicated.

### Spatial Discretization

The computational domain was discretised using polyhedral cells for the core mesh, and low aspect-ratio prism cells adjacent to walls and the ground. Computational meshes were constructed for each of the three different study configurations.

The computational domain includes the proposed development site, with surrounding buildings and topographical features within a 600m radius represented explicitly. The full computational domain extends to 1500m in the along-wind direction, 1100m in the across-wind direction, and 450m vertically.

The proposed development and immediate vicinity were meshed down to a cell size of 0.2m in order to capture the detailed geometric features and resulting flow artefacts. The pedestrian ground level surfaces were meshed with a prism layer mesh of 5 layers, which, in the vicinity of the building rise up to a total height of 1.5m above the ground.

### Solution Method

The modelling of an incompressible fluid flow was completed with combinations of semi-implicit method for pressure-linked equations (SIMPLE) algorithms. The resulting flow turbulent features were modelled with introduction of the Shear Stress Transport (SST) k- $\omega$  turbulence model. This model was suggested by Menter and is based on a two-equation eddy-viscosity approach, where the SST model formulation combines the use of a k- $\omega$  in the inner parts of the boundary layer, but also switches to a k- $\epsilon$  behaviour in the free-stream regions of the solutions. Further details for the selected turbulence model are provided in the work of Menter.

### Inlet and Boundary Conditions

The atmospheric boundary layer flow was simulated by implementing a logarithmic velocity profile model presented by Richards and Hoxey, with the following main assumptions:

- The vertical velocity component at the domain boundary is negligible

- The pressure gradient and shear stress are constant

The model implies the following equation for the mean inlet velocity at the CFD domain:

$$U(z) = \frac{U^*}{\kappa} \cdot \ln\left(\frac{z + z_0}{z_0}\right)$$

where:

- $\kappa$  - is the von Karman's constant
- $z$  - is the distance from the ground surface in vertical direction
- $z_0$  - is the ground surface roughness length in meters

The friction velocity  $U^*$  is calculated by the following equations:

$$U^* = \kappa \cdot \frac{U_{ref}}{\ln\left(\frac{z_{ref} + z_0}{z_0}\right)}$$

where:

- $z_{ref}$  - is the reference height in metres
- $U_{ref}$  - is the reference velocity in m/s measured at  $z_{ref}$

The turbulent velocity fluctuations at the domain inlet are induced by the constant shear stress with height, maintained by the turbulent kinetic energy  $k$  equation below:

$$k(z) = \frac{(U^*)^2}{\sqrt{C_\mu}}$$

where:

- $C_\mu = 0.09$  - is a  $k$ - $\epsilon$  turbulence model constant

All surface boundary conditions were modelled as smooth walls with a no-slip condition. A no-slip wall boundary condition with a varying roughness length height based on the terrain analysis for the site was applied on the ground surface outside the explicit surrounds area of the domain.

### Gust Equivalent Mean Calculation

The gusts in the wind flow is a major component that may lead to additional danger and discomfort to that caused by the mean wind flow. Thus, the gust wind speed is accounted by a calculation of the equivalent mean wind speed, considering the standard deviation of the mean wind speed, in particular the turbulent kinetic energy,  $k$ :

$$\sigma = \sqrt{(k * 2/3)}$$

The GEM is then calculated as:

$$U_{GEM} = \frac{U_{Mean} + 3.5\sigma}{k_g}$$

Where gust factor,  $k_g = 1.85$

The final speedup used in the Lawson criteria is the worst case from  $U_{GEM}$  and  $U_{Mean}$ .



21<sup>st</sup> November 2023

Housing, Regeneration and Planning  
Haringey Council  
River Park House  
225 High Road  
London, N22 8HQ

Dear Samuel,

**THFC Hotel S73 Application – Wind Microclimate Review**

A detailed review of the wind microclimate assessment forming part of the ES Addendum, submitted in support of the S73 planning application for the proposed THFC Hotel, forming Plot 3 of the Northumberland Development Project (NDP), was carried out by Urban Microclimate Limited and presented in a report dated 23<sup>rd</sup> October 2023.

This follow-up report reviews the further information and clarifications provided by the applicant, in response to the initial review.

This report then goes on to review Annex 3: Wind Microclimate ES Addendum Update of the ES Addendum Supplementary Note (October 2023), which addresses amendments to submitted proposals.

The review does not extend to a detailed technical analysis, and we have not conducted our own assessments.

## Conclusions from October 2023 Review

As indicated in the October 2023 review report, the overall approach was considered appropriate and broadly in line with best practice, though a non-standard practice (in averaging exceedances of target threshold wind speeds) seemed to have been applied in assessing the significance of some of the results.

The assessment scenarios included an updated Baseline, which appeared to omit wind mitigation measures accounted for in the 2015 ES for the current phase, and omitted the interim scenario comprising the completed Hotel in the absence of Plots 4 and 5, which appeared to represent the worst-case scenario for the consented Hotel in the 2015 ES. This made a direct comparison of the effects of the proposed Hotel and the consented Hotel difficult. Summaries included in the NTS and Chapter 2 of the ES suggested a reduction in effects from moderate adverse to negligible, but the moderate adverse effects for the Consented scheme were understood to apply to the interim scenario, for which mitigation was not developed. The NTS then went on to suggest that effects remain in line with the Consented scheme, which appeared more appropriate. Some beneficial effects, ranging from major in terms of safety to moderate in terms of comfort, were also reported but this was relative to the updated Baseline which appeared to omit wind mitigation measures accounted for in the 2015 ES for the current phase and should therefore be treated with caution.

With the inclusion of designed-in mitigation, residual effects were assessed as generally negligible, though the discussion referred to minor adverse effects on the elevated amenity spaces which were not then listed in the summary table. Whilst plausible, these assessed residual effects did appear to depend on:

- Mitigation measures which may not be included within the scheme submitted for approval;
- Limited uses of recreational spaces (particularly outdoor seating) which may not be in line with those illustrated in the plans submitted for approval; and
- Mitigation developed in the 2015 ES for Plots 4 and 5 being similarly effective with the proposed Hotel introduced, though this has not been verified as part of the wind tunnel studies.

These potential issues were included in the recommended list of clarifications on the following page.

The recommended clarifications requested from the applicant were as follows:

1. provide further justification for the scenarios assessed;
2. clarify the details modelled for the Baseline scenario;
3. provide further details of the atmospheric boundary layer simulation used;
4. provide further details of the climate data applied (Figures B.2 to B.6);
5. clarify any updates to the proposed Hotel Development (and their potential effects) implemented subsequent to the wind tunnel tests;
6. provide further justification for the stated effectiveness of the preliminary Plot 4 and 5 mitigation;
7. clarify existing and proposed conditions at the following further sensitive surrounding receptors:
  - The Dare Skywalk;
  - Podium level entrances and potential café outdoor seating for the Tottenham Experience;
  - The playground of St Francis de Sales Junior School; and
  - Commercial and residential entrances and private gardens along Park Lane.
8. clarify the proposed usages of the proposed Hotel amenity spaces, the wind mitigation measures implemented and the resulting suitability of wind conditions;
9. clarify the proposed process for securing any required mitigation measures (or appropriate alternatives) not included in the design submitted for approval;
10. clarify which elements of the wind mitigation create the improvement on the east side of the Hotel (sensor location 72); and
11. provide further details of the CFD studies carried out to assess the private balconies.

## Review of Clarifications and Further Information (November 2023)

### 1. Provide further justification for the scenarios assessed

The response states that the proposed Hotel forms part of the wider, consented, scheme assessed, and that the interim scenario assessed in the 2015 ES provided sensitivity tests of a short window, not reflective of the Consented Scheme. The validity of this response depends on the final construction phasing which, it is understood, is not currently fixed.

Should the remaining phases be constructed in a single, overlapping, construction period then it is agreed that the assessment of the proposed Hotel within the wider consented scheme is appropriate.

Should the proposed Hotel be completed and occupied prior to commencement of the later phases then an assessment of this interim scenario, to identify the requirements for, and verify the effectiveness of, additional temporary wind mitigation measures would be advisable. **It is therefore recommended that, pending the final construction programme, a planning condition be attached to any consent requiring this further assessment.**

### 2. Clarify the details modelled for the Baseline scenario

The response confirms that some of the mitigation measures committed to in the 2015 ES have not yet been implemented, that the existing trees to the southeast of the stadium were omitted from the model and that the stepped geometry of the stadium, which may benefit conditions at the recessed entrances, was not represented on the model. On this basis, the assessed baseline is conservative, and any reported beneficial effects of the introduction of the proposed Hotel and remaining phases should be considered accordingly.

### 3. Provide further details of the atmospheric boundary layer simulation used

Further details of atmospheric boundary layer simulation are provided and are considered acceptable.

### 4. Provide further details of the climate data applied (Figures B.2 to B.6)

Further details of climate data are provided and are considered acceptable.

### 5. Clarify any updates to the proposed Hotel Development (and their potential effects) implemented subsequent to the wind tunnel tests

This requested clarification is largely superseded by the ES Addendum Supplementary Note, discussed later in this report.

The relocation of the podium-level entrance from the set-back southeast corner to the eastern elevation is not expected to materially affect the suitability of

conditions, which are expected to remain suitable for pedestrian ingress / egress. This conclusion is considered plausible.

#### **6. Provide further justification for the stated effectiveness of the preliminary Plot 4 and 5 mitigation**

The response suggests that preliminary computer modelling studies (CFD) helped identify the worst-case areas, to locate the wind speed sensors for the wind tunnel studies. This is a plausible explanation for the worse conditions reported than in the 2015 ES.

The response goes on to state that the Plot 5 conditions are largely driven by southerly and south-westerly winds, such that the conditions are not particularly sensitive to the final form of the proposed Hotel, with any beneficial sheltering effects limited to winds from the west and west-south-west.

Overall, the response suggests that the final Plot 4 and 5 mitigation measures may need to be more substantial than the preliminary 2015 measures, but that a broadly similar approach (comprising mainly deciduous trees and evergreen hedges) should remain a viable mitigation strategy.

Best practice would have reconfirmed the effectiveness of the preliminary Plot 4 and 5 mitigation strategy during the wind tunnel studies. However, given that further testing will be required during the detailed design stages for the future phases, the response is considered acceptable.

#### **7. Clarify existing and proposed conditions at the following further sensitive surrounding receptors**

The further receptors are assessed based on a combination of the wind tunnel results and CFD, understood to have been carried out during the design development stages. Assuming that the CFD has been validated against the subsequent wind tunnel test results, this approach is considered acceptable.

#### **The Dare Skywalk**

The response indicates that summer conditions are expected to be suitable for a mix of leisurely strolling and fast / business walking for baseline conditions, with the area suitable for only for fast / business walking reduced for proposed site conditions. The effect of the proposed Development is therefore stated as minor beneficial. This conclusion is considered plausible, though based on the significance criteria outlined in the ES Addendum this would perhaps more appropriately be stated as negligible. It should also be noted that we have not been able to identify the exact route of the Skywalk or the seasonal usage and so assume that the relevant information has been provided to the applicant's consultant and applied accordingly.



### **Podium level entrances and potential café outdoor seating for the Tottenham Experience**

The response indicates that conditions at the entrances are expected to be suitable for associated uses for both the baseline and proposed site conditions and that the effect of the proposed Development is therefore negligible. This conclusion is considered plausible.

The response regarding the potential café outdoor seating considers a roof area, rather than the podium-level area requested (and shown in the wider landscaping plans). The presented podium-level results appear to suggest that baseline conditions may be suitable for outdoor seating in summer but that with the introduction of the proposed Development conditions may become too windy for such uses. **It is recommended that further clarification be requested on this.**

### **The playground of St Francis de Sales Junior School**

The response indicates that conditions are expected to be suitable for associated uses for both the baseline and proposed site conditions and that the effect of the proposed Development is therefore negligible. This conclusion is considered plausible.

### **Commercial and residential entrances and private gardens along Park Lane**

The response indicates that conditions are expected to be suitable for associated uses for both the baseline and proposed site conditions and that the effect of the proposed Development is therefore negligible. This conclusion is considered plausible.

#### **8. Clarify the proposed usages of the proposed Hotel amenity spaces, the wind mitigation measures implemented and the resulting suitability of wind conditions;**

This requested clarification is largely superseded by the ES Addendum Supplementary Note, discussed later in this report.

The response suggests that the communal residential terrace at Level 14 (previously at Level 13) is 'substantially' suitable for general recreational activities, including short-term standing, from spring to autumn. The 'substantially' presumably excludes the northeast corner, which the ES Addendum appeared to indicate was marginally windy for such uses in spring (though it is assumed that this would be largely driven by north-easterly winds which are typically cold in spring and would likely limit recreational uses anyway). The response does however acknowledge that conditions are too windy for outdoor seating along the east side of the terrace, where both the submitted drawings and the DAS illustrations suggest seating. It is agreed that this would represent a moderate adverse effect. It is suggested that there is flexibility in the final layout of the terrace and that the seating could be located in the northwest corner, where conditions were assessed as suitable for such uses. However, it is unclear how well this would work with the revised direct access route to the terrace.

**9. Clarify the proposed process for securing any required mitigation measures (or appropriate alternatives) not included in the design submitted for approval;**

This requested clarification is partially superseded by the ES Addendum Supplementary Note, discussed later in this report.

The response suggests that the wind break on the Level 13 terrace (previously at Level 12) has been removed and it is understood that this is accounted for in the ES Addendum Supplementary Note.

The response suggests that dividing (or privacy) screen are incorporated into the revised Level 27 to Level 29 terraces and that these are accounted for in the ES Addendum Supplementary Note.

No additional or alternative mitigation measures are identified.

**10. Clarify which elements of the wind mitigation create the improvement on the east side of the Hotel (sensor location 72); and**

The response confirms that conditions at location 72 are very marginal with respect to the fast / business walking criterion in winter, such that the change in comfort rating is most likely due to experimental accuracy. This a common occurrence in any experimental approach applying pass / fail thresholds and the explanation is considered acceptable. Based on this, conditions are likely to be considered at least tolerable and it is agreed that the effect, on pedestrian passage along the east side of the proposed Hotel, could be considered no worse than minor adverse.

**11. Provide further details of the CFD studies carried out to assess the private balconies.**

Further details of balcony assessment are provided and are considered acceptable.

## Review of ES Addendum Supplementary Note (October 2023)

The further wind microclimate assessment summarised in the ES Addendum Supplementary Note is based on an expert review of the amendments, supplemented by computational modelling (CFD) to illustrate comparative wind speeds (between the submitted and amended schemes) in the areas most likely to be affected by the amendments.

It should be noted that the steady-state CFD approach applied provides only an estimate of gust effects and does not explicitly model the gusts. As stated in the supplement, a detailed quantitative assessment, to confirm conditions in terms of pedestrian and occupant safety and comfort, would require wind tunnel testing (as applied in the July 2023 ES Addendum).

Given the extent of the amendments, and that the CFD has presumably been validated against the wind tunnel tests, the overall approach applied in the supplement is considered acceptable. However, it is recommended that any future development of further wind mitigation measures be carried out through wind tunnel testing, to ensure that gusts are fully accounted for.

The key areas with potential to be affected by the amendments are discussed as follows:

### Street Level - Southern Plaza

The supplement suggests that worst-seasonal conditions should be comfortable for short-term standing / sitting associated with entrance uses and waiting areas. However, both the wind tunnel tests (ES Addendum) and preliminary CFD (clarifications response) appear to show accelerated winds, suitable only for leisurely strolling during at least the worst season, encroaching on the general vicinity of the west parts of the plaza planters with benches. It is understood that the planters and trees are not represented in any of the assessments, but the trees do not appear to extend to the western part of the planter and any localised benefit from the landscaping would therefore depend on the type and heights of the shrubs.

**It is recommended that the applicant re-confirm the expected suitability of conditions for proposed uses within the plaza.**

### Podium Level – Northern Terrace

The supplement suggests that the proposed amendments to the barrier scheme around the northern terrace would not be expected to materially affect the suitability of conditions for proposed recreational uses. This is considered plausible.

Both the supplement and the ES Addendum clarifications also suggest the removal of a planter from the north-western corner of the podium terrace. Although the corner planter appears to be reduced in extent, it is not clear which planter may have been removed. **It is recommended that further clarification be requested on this.**

The supplement concludes that suitable conditions for outdoor seating may be limited to the area long the northern façade. This presumably refers to the central area, away from the corners. The amended plans show seating extending significantly beyond this area, where conditions are not expected to be suitable for such uses. The residual effect in these areas is assessed as moderate adverse. This is considered plausible, and we would recommend further mitigation.

### **Level 13 – Hotel Roof Terrace**

The supplement suggests that the proposed amendments to the terrace layout would not be expected to materially affect the suitability of conditions for proposed recreational uses. This is considered plausible.

It is not clear if the CFD accounts for the removal of the wind break, which it had been assumed was a key component in mitigating the exceedance of the safety criteria at the southwest corner of the upper levels. **It is recommended that further clarification be requested on this.**

The conclusion of the supplement is understood to allow for the wind break's omission and conditions are expected to be suitable for general amenity space, including short-term sitting, from spring to autumn. Conditions are however expected to be too windy for the outdoor seating uses indicated by the amended plan. The residual effect in these areas is assessed as moderate adverse. This is considered plausible, though clarification on the wind break is still recommended. We would also recommend further mitigation.

### **Levels 27 to 29 – Private Residential Terraces**

The supplement suggests that conditions at the upper-level private terraces should be generally similar to those for the submitted scheme. Conditions are generally expected to be suitable for short-term standing / sitting from spring to autumn. Provided that summer conditions are towards the lower end of this comfort rating (and not only marginally below the strolling rating) it is agreed that these conditions should be acceptable for an elevated private space and the effect would be negligible.

Part of the northern terrace, at Level 29, is assessed as suitable only for leisurely strolling. It is agreed that this would represent a localised moderate adverse effect, though part of the terrace does appear to enjoy suitable conditions for outdoor seating.

## Review Conclusions

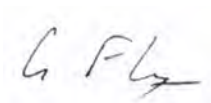
The overall approach for the ES Addendum and Supplement is considered largely appropriate, though there remain some concerns, as follows:

- Should the proposed Hotel be completed and occupied prior to commencement of the later phases then assessment of this interim scenario, to identify the requirements for, and verify the effectiveness of, additional temporary wind mitigation measures would be advisable. **It is therefore recommended that, pending the final construction programme, a planning condition be attached to any consent requiring this further assessment.**
- The CFD results included within the clarifications appears to suggest a potential adverse impact on the podium-level café outdoor seating for the Tottenham Experience, shown in the landscaping masterplan. **It is recommended that further clarification be requested on this.**
- Both the wind tunnel tests (ES Addendum) and preliminary CFD (clarifications response) appear to show accelerated winds encroaching on the general vicinity of the southern plaza planters / benches. **It is recommended that the applicant re-confirm the expected suitability of conditions for proposed uses within the plaza.**
- **It is recommended that the applicant clarify how the planter referenced in the northwest corner of the podium-level terrace and the wind break at the L13 terrace has been considered in the ES Addendum Supplement.**

Subject to the further clarification, it appears that there are some moderate adverse effects on proposed amenity spaces. These would likely benefit from further development of the wind mitigation measures.

It is recommended that any future development of further wind mitigation measures be carried out through wind tunnel testing, to ensure that gusts are fully accounted for.

Yours sincerely,



**Dr Graeme Flynn**  
**Director**  
**Urban Microclimate Limited**

28<sup>th</sup> November 2023

Samuel Uff, Principal Planning Officer, Haringey Council  
 River Park House, 225 High Road, London, N22 8HQ.

Dear Samuel,

**Northumberland Development Project – Section 73 Application  
 Wind Microclimate ES Addendum Review**

I write in relation to the further queries & comments returned by Urban Microclimate on 21<sup>st</sup> November regarding the wind microclimate studies for the Northumberland Development Project (NDP) Section 73 Application (Ref. HGY/2023/213). The queries & comments along with our responses are as follows:

Query / Comment	Response
<p>Should the proposed Hotel be completed and occupied prior to commencement of the later phases then assessment of this interim scenario, to identify the requirements for, and verify the effectiveness of, additional temporary wind mitigation measures would be advisable.</p>	<p>This seems reasonable; that said, with the concern expressed being related to the microclimate around the hotel and its immediate vicinity during a period where it is temporarily more exposed, it is recommended that further assessment be limited to this region.</p>
<p>The CFD results included within the clarifications appears to suggest a potential adverse impact on the podium-level café outdoor seating for the Tottenham Experience, shown in the landscaping masterplan.</p>	<p>The podium-level café outdoor seating that would form part of the TH Experience is anticipated to come forward in a similar time frame to the hotel, however it's precise design &amp; arrangement is not fully established. Summertime conditions are currently expected to be suitable for short-term sitting which would be too windy in the absence of any further mitigation.</p> <p>The applicant has, however, indicated that they are happy to explore tailored landscaping or other typical sheltering measures at an appropriate stage in order to locally enhance conditions and ensure they are improved for café seating.</p>
<p>Both the wind tunnel tests (ES Addendum) and preliminary CFD (clarifications response) appear to show accelerated winds encroaching on the general vicinity of the southern plaza planters / benches.</p>	<p>The observation is correct, in the area where benches / planters are sited around one-third of this region is predicted to meet the threshold wind speed for short-term standing / sitting in winter between 90% and 95% of the time, with the remaining two-thirds predicted to be suitable between 95% and 98% of the time.</p>

	<p>Of course, as was noted in earlier submissions, neither the trees nor other landscaping were modelled for this area as their precise form was not well understood until recently. The assertion that the trees are unlikely to materially help the conditions at the western end of the area is agreed, though it seems likely that the planter itself (shown in the DAS and being of the order of 500mm high) with dense perennial planting a further 500mm (or possibly more) would provide a useful degree of shelter from winds recirculating in this area once deflected away from the hotel. In particular, seated individuals are likely to benefit from this shelter, to the extent that only the western tip of the bench seating is likely to experience strolling conditions in winter. Given the improved suitability elsewhere, this is likely to be tolerable.</p>
<p>It is recommended that the applicant clarify how the planter referenced in the northwest corner of the podium-level terrace and the wind break at the L13 terrace has been considered in the ES Addendum Supplement.</p>	<p>The planter that was removed was in the very far north-western corner of the podium terrace, this was absent for any analysis carried out for the ES Addendum Supplement.</p> <p>To provide a like-for-like comparison of the L13 terrace with the earlier version of the scheme reported with mitigation, including the wind break, this element was included, and as the ES Addendum Supplement notes, modest differences would occur in parts of this terrace for particular wind directions, but these are unlikely to change the resulting suitability. That said, the ES Addendum Supplement goes on to note that the likely removal of the wind break would contribute to a moderate adverse effect – this is of course known because the presence and absence of the wind break was tested as part of the original wind tunnel studies. The recommendation for further mitigation is noted.</p>

Yours Sincerely,



Dr Robin Stanfield  
**Director**  
**Architectural Aerodynamics**

## Samuel Uff

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**From:** Graeme Flynn <gflynn@urban-microclimate.com>  
**Sent:** 28 November 2023 15:20  
**To:** Samuel Uff  
**Cc:** Robbie McNaugher; John McRory  
**Subject:** RE: THFC Hotel - wind microclimate peer review

Hi Sam,  
I've had a quick look at the further responses.

On point 1, I don't think the study area for a potential interim scenario assessment should be restricted at this stage. A review of the surrounding sensitive receptors would need to be carried out, taking account of any additional available information at that time, including the potential time period prior to commencement of the subsequent phases.

On point 2, creating suitable conditions through development of the landscaping should be viable.

On point 3, this seems reasonable.

On point 4, the response does not explicitly state if the wind break is required in relation to occupant safety. The assessed moderate adverse residual effect does suggest that the retained measures are expected to mitigate the exceedance of the safety criteria, and that only comfort would remain an issue, but you may wish to seek confirmation on this.

Best regards,  
Graeme

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**From:** Samuel Uff <Samuel.Uff@haringey.gov.uk>  
**Sent:** Tuesday, November 28, 2023 2:02 PM  
**To:** Graeme Flynn <gflynn@urban-microclimate.com>  
**Cc:** Robbie McNaugher <Robbie.McNaugher@haringey.gov.uk>; John McRory <John.McRory@haringey.gov.uk>  
**Subject:** RE: THFC Hotel - wind microclimate peer review

Hi Graeme,

We have a short response from the applicant. Does this all seem reasonable to you, alongside a required for further wind mitigation measures as part of the landscaping?

Thanks  
Sam

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**From:** Graeme Flynn <[gflynn@urban-microclimate.com](mailto:gflynn@urban-microclimate.com)>  
**Sent:** 23 November 2023 08:57  
**To:** Samuel Uff <[Samuel.Uff@haringey.gov.uk](mailto:Samuel.Uff@haringey.gov.uk)>  
**Cc:** Robbie McNaugher <[Robbie.McNaugher@haringey.gov.uk](mailto:Robbie.McNaugher@haringey.gov.uk)>; John McRory <[John.McRory@haringey.gov.uk](mailto:John.McRory@haringey.gov.uk)>  
**Subject:** RE: THFC Hotel - wind microclimate peer review

Hi Sam,  
Without knowing all the design constraints and how much over the target thresholds the current conditions are, it is difficult for us to advise on the potential to achieve suitable conditions.