RWDI Response #	HM Section #	Hilson Moran Comment	RWDI Response
1	2.1	"… it should be noted that one of the drawbacks of using wind tunnel testing is that it does not allow for the flow conditions in the full domain to be analysed and visualised but only offers discrete-point analysis. The ability to visualise the full domain can be undertaken through the use of Computational Fluid Dynamics (CFD) and the ES confirms that CFD was in fact used to inform the early stages of the design."	This project employed CFD to inform the early massing design, with the wind tunnel testing used to fully quantify comfort and safety conditions as well as to develop an effective mitigation strategy. It is worth noting that CFD, whilst yielding a "full" view of the domain in question, usually relies on RANS turbulence models which provide time-averaged results. These results in a lack information regarding the level of turbulence and gusts expected in any given area. This means the occurrences of strong winds, which can have safety implications cannot be assessed accurately. Additionally, the increased levels of gustiness can lead to uncomfortable conditions which would be averaged out by a RANS model. Mitigation measures are also hard to model accurately computationally, with our experience showing that CFD will often over-predict the effect of these measures, yielding a non-conservative result.
2	2.1	"… it is also important to understand how the results of the CFD influenced the selection of the receptor locations within the proposed site and its surroundings and it recommended that this is demonstrated."	This project employed CFD to inform the early massing design. When it came to the wind tunnel testing, we employed our standard practice of selecting the locations for probes based on the sensitivity of areas and experience-informed knowledge of areas that would tend to be windier than desired or are likely to experience strong winds. The number of probes used was extensive and allows for an informed assessment to be made about wind conditions within the domain. The probe layout was subsequently discussed and approved by Hoare Lee (CFD consultant).
3	2.1	"It would also be informative to see the flow patterns from the CFD for the various wind directions to better understand the wind environment on the site."	This is outside RWDI's remit.
4	2.3	"…the methodology used for conversion of the measured gust wind speed into the 'Equivalent Hourly-Average Gust Speed' in order to assess exceedance of threshold wind speeds has not been provided and should be clarified."	Conversion between the measured gust wind speed and the "Equivalent Hourly-Average Gust Speed" is carried out as specified by Lawson. The ratio used to convert between gust speed and "Equivalent Hourly-Average Gust Speed" is 1.85 – this relates to a turbulence intensity value of 30% for a 3 second gust speed with a 1% probability of exceedance. Lawson selects these values as they are representative of the "average" found in a shopping precinct – and area where most different pedestrian uses will be found and applies to most wind tunnel investigations.
5	2.4	"The Bristol methodology defines Beaufort Force 6 wind speeds as the limits of safety. The discussion reported within the ES takes the view that wind speeds occasionally exceeding Beaufort Force 6 are unlikely to generate a nuisance to pedestrians on a thoroughfare. However, wind speeds exceeding the Bristol safety limits present a risk that a frail and elderly or a very young pedestrian could find walking difficult in these areas, or could even stumble and fall. Therefore, the recommendation of this review is that the threshold of pedestrian safety is maintained in all accessible areas or	It is RWDI's opinion that, for thoroughfares, a B6 exceedance does not represent a significant safety concern. The requirements for the exceedance of this threshold falls amongst the lower end of most widely used criteria in the industry. For many (including LDDC), this type of exceedance would not require reporting. Our practice nevertheless is to report the occurrences of B6, and our reason for doing so is that for particularly sensitive locations we may need to consider mitigation (e.g. a disabled parking space, or children's play areas). We assess these occurrences case-by-case for the sort of circumstances that might make the location particularly sensitive. In all those that occur in the study of Elephant & Castle, we have found they do not meet the specific circumstances to be considered significant; instead they are regular thoroughfares, and so we consider the B7 threshold to be an appropriate threshold for a significant concern. This is our practical interpretation of Lawson's argument (on the subject of predicting risks associated with strong winds) that "consideration must be given to many other factors, including the likelihood of a frail person being at the location during the strongest gust of the windiest hour of the year" i.e. that if there is a higher likelihood of a "frail" person being at a

RWDI Response #	HM Section #	Hilson Moran Comment	RWDI Response
		alternatively, mitigation measures and management controls are put in place."	particular location, that we should consider that location to be more sensitive to high winds, and would therefore treat the B6 threshold as significant. Furthermore: - The B7 threshold agrees fairly well in practice to the lowest 'distress' threshold in Lawson's other criteria (known as LDDC). For reference, that is a 15m/s wind speed occurring for 0.025% of the time annually, compared to an approx. 17m/s (i.e. the limit of B7) wind speed occurring for 0.01% of the time. - Instances of B6 winds typically occur (in the London wind climate, at least) together with conditions suitable for 'leisure walking', while B7 typically occurs with 'business walking' (and occasionally the higher end of 'leisure walking'). To apply B6 as a hard limit would, in our experience, be unnecessarily onerous, and would contradict the assessment of suitability in many cases.
6	2.4	"Paragraphs 14.32 of the ES have defined the frequency of strong winds as those that exceed Beaufort Force 6 for more than 1 hour per year. Lawson's Bristol Method requires the identification of locations in which the wind speed has a 0.01% probability of being exceeded in any specified month (or the whole year). This is a frequency of less than 'Once in a Year' and presents a more conservative approach. It is therefore, recommended that the 0.01% frequency limits are adopted in place of the 1 hour per year currently adopted within the ES."	As mentioned above, the exact implications of exceeding the distress criteria need to be considered by an experienced wind engineer. In RWDI's opinion, the annual distribution of strong winds does not affect the hazard they may pose (i.e. if 2 strong wind events are expected in December, they are just as hazardous as a scenario where two strong wind events occur in separate months). As such, we do not consider the reporting of monthly strong winds to be necessary or particularly informative. Additionally, as these winds lie at the very tail end of the wind speed probability distribution, specifying exact months can be counter-productive. These are rare events, that can occur at unexpected times (usually during the very worst weather of the year). As the occurrence of these conditions can vary significantly (and somewhat randomly), RWDI is of the opinion that these monthly predictions are not useful and may be counter-productive. We consider our treatment of strong winds within the assessment to be appropriate, based on our experience of conducting similar wind assessment in London and throughout the UK. Through careful, iterative testing, mitigation measures have been designed and incorporated to reduce the frequency and speed of these strong winds, and the conditions that remain are, in our opinion, suitable. The baseline scenario already has exceedances of the B6 and B7 strong wind threshold. With the Proposed Development in place, the frequency of occurrence of strong winds remains broadly the same, if not calmer – note the lack of B7 exceedances in Configurations 4 and 5.
7	2.5.1	"Paragraph 14.3 of ES Chapter 14 defines the occurrence of winds exceeding Beaufort Force 7 (which equates to an hourly average upper wind speed limit of 17.20 m/s) as unacceptable for cyclists. The following is an extract from Building Aerodynamics (Tom Lawson, 2001): *…. the wind speed limit for the "General Public" was an hourly average wind speed of 15 m/s, and in areas*	This comment refers to the LDDC distress criteria and not the Bristol criteria used in this ES Chapter. It should be noted that the 15 m/s threshold (in the LDDC criteria to which the reviewer is referring) has a different probability threshold - 0.025% of the year instead of 0.01%. In our experience of using both sets of criteria, when this change in probabilities is taken into account, a B7 exceedance for 0.01% of the year agrees broadly with the 0.025% 15 m/s threshold.

RWDI Response #	HM Section #	Hilson Moran Comment	RWDI Response
		where any frail person or cyclist would not be expected, the wind speed was 20 m/s…..” Following on from the above, 15 m/s has been generally adopted as a cyclist safety threshold within the planning context which is lower than the threshold adopted within the ES. It is recommended that the lower safety threshold is adopted.”	
8	2.6.1.1	“Safety (strong wind) exceedance identified in proximity to the West Side Block W1 (illustrated in Figure 1). Receptor 307 is in close proximity to an amenity area identified for sitting. “	Receptors 307 and 275 represent thoroughfares. Attention is drawn to receptor 420, which is in the location of the seating area in question and records no strong wind exceedances.
9	2.6.1.1	“Safety (strong wind) exceedance identified in proximity to the West Side Block W2 (illustrated in Figure 2). Receptor 317 is adjacent to the main entrance of the cultural venue. “	316 is the receptor representing the entrance to the cultural centre and does not have strong wind exceedances. 317 is representative of the thoroughfare. The inset nature of the entrance provides significant shelter (note its comfort condition is “Sitting” even in winter).
10	2.6.1.1	“Safety (strong wind) exceedance identified in proximity to the East Side Blocks E2 and E3 (illustrated in Figure 3). Receptors 64 and 61 lie in close proximity to potential retail entrances. “	During testing, these areas were not designated as entrances, but rather as thoroughfares. If entrances are located in this area, recessing has been recommended (as mentioned in 2.6.2.1 of the peer review). This is expected to be sufficient to mitigate the conditions.
11	2.6.1.1	“Further to the above, Figure 4 illustrates a localised safety (strong wind) exceedance on the terrace on W1, Tower 1 which is designed to accommodate doorstep play for age 0-5 years old for the residents of this tower.” …. “Strong wind exceedances were also identified within the podium level of Block E3 (receptor 193) which is intended for children’s play with a formal garden in the central zone with the south area of the podium designed as an outdoor extension of the gym.”	These areas will be subject to further development to help mitigate these strong winds. It is believed this can be achieved through further refinement of the landscaping schemes for these areas (receptors 362, 361, 343, 261, 193 and 179). If necessary, management control measures will be employed in these areas as well.
12	2.6.1.1	“The remaining receptors presented generally lie within pedestrian thoroughfares and the discussion in	Please see Response 5.

RWDI Response #	HM Section #	Hilson Moran Comment	RWDI Response
		the ES takes the view that these are unlikely to cause a nuisance to pedestrians. However, these areas exceed the limit of safety defined under the Lawson Bristol Method which is Beaufort Force 6 and therefore, a frail or elderly pedestrian could find walking difficult in these areas, or could even stumble and fall. It is therefore, recommended that further measures for wind shelter are explored in these areas."	
13	2.6.2.1	"No commentary has been provided on the exceedances observed within the surroundings when compared to the existing conditions and this should be undertaken."	Off-Site Residual Effects When compared to the baseline scenario (configuration 1), the proposed development (configuration 4) is considered to generally have a calming effect on the conditions measured within the surroundings. The amenity area to the south-west of the Site (receptors 227-229, 395-399) sees an overall calming effect during the summer season. Receptors 229, 396, 398 and 399 become calmer by one category level. Receptor 399, which previously experienced leisure walking conditions now measures standing conditions. The overall area now experiences a mix of standing and sitting use conditions which are considered more suitable for the area's intended use. No receptors in this area register windier conditions. The amenity area to the north of the Site (receptors 288 – 292 and 295, 297 also experiences an overall calming effect. Receptors 290, 292 and 297 become calmer by one category (from standing to sitting). The overall area now experiences a mix of standing and sitting use conditions which are considered more suitable for the area's intended use. No receptors in this area register windier conditions. Conditions along the amenity area to the south-east of the Site (receptors 1, 2, 3) are expected to shift slightly, but overall remain roughly the same. Here, receptors 1 and 2 become calmer by 1 category whilst receptor 3 increases in windiness by one category. Thoroughfares are expected to remain largely the same, with the exception of the areas represented by receptors 170 and 171, which become calmer from leisure walking conditions to standing use conditions. Receptors 329 and 328 increase in windiness by one category (from sitting to standing), and remain suitable for their intended use. All measured off-site entrances, with the exception of the entrance represented by receptor 404 are considered to have conditions calmer, or suitable for their intended use. The entrance represented by receptor 169 becomes calmer from business walking to standing conditions (2 category levels) by the presence of the Proposed Development. Receptor 404 increases in windiness by one category level, which does result in this entrance being windier than desired by one comfort category (i.e. a residual minor adverse effect). We would note that this location does not have significant strong winds, and that the effect may be temporary as conditions return to the desired standing use conditions in the cumulative scenario (configuration 5).

RWDI Response #	HM Section #	Hilson Moran Comment	RWDI Response
			With the introduction of the cumulative surrounds, conditions measured within the surroundings are expected to become generally calmer. This is not expected to change the suitability of any off-site areas, with the exception of receptor 404, which represents an entrance and becomes calmer by one comfort category. These conditions are considered suitable for the areas' intended use.
14	2.6.2.1	"When the windiest season results of configuration 1 (Existing Site with Existing Surroundings) is compared with configuration 4 (Proposed Development with Existing Surroundings and Mitigation Measures), it can be observed that receptor 404 exhibits 2 step windier conditions (from sitting to leisure walking) and exceeds the comfort threshold for entrances. This receptor is in proximity to the main entrance of the Metropolis Apartment Housing on Oswin Street as illustrated in Figure 5 and therefore, it is recommended that mitigation measures for this receptor are explored. The inclusion of the vertical baffles on tower W1, in configuration 5, helps to reduce the wind effects at this receptor. However, the cumulative effect of all mitigation and inclusion of all proposed surrounding buildings results in improvements for point 404 (from configuration 4 to 5) which appears too significant to come from these changes alone therefore further mitigation should still be investigated."	The difference between Configurations 4 and 5 is not a change in mitigation measures, but the inclusion of cumulative surrounds (mainly to the south-west). These surrounds are expected to provide a sheltering effect around the intersection of Oswin St and Brock Drive which is expected to have a significant effect throughout Oswin Street. Along Oswin street, 3 points become calmer by one category level (including receptor 404) and 2 become windier by one category. This is in line with what would be expected from the addition of cumulative surrounds to the south-west of the area in question – these surrounds help shelter the area from the prevailing south-westerly winds. The impact of conditions measured by receptor 404 is discussed as part of commentary of conditions expected within the surroundings in Response 13.
15	2.6.2.2	"A review of the results under configuration 4 (summer season) reveals that conditions for sitting are exceeded near the entrance to Pastor Street where seating has been proposed, as illustrated in Figure 6. This should be reflected within the assessment and used to inform the landscape strategy"	During testing, this area was not designated as a seating area. This area will be subject to further development to help mitigate these conditions. We anticipate that this can be achieved through further refinement of the landscaping schemes.
16	2.6.2.3	""In the absence of cumulative developments, one of the additional safety exceedances identified is at the junction of Elephant Road and	This is a thoroughfare (Please see Response 5). Additionally, receptor 394 observed exceedances of the strong wind criteria in the baseline configuration (C1). Receptor 427 was added in later testing as a response to this exceedance – it is very likely that this receptor would also have registered strong wind exceedances. These receptors were added to ensure conditions were not being

RWDI Response #	HM Section #	Hilson Moran Comment	RWDI Response
		Walworth Road (receptors 11, 427 and 394), illustrated in Figure 7 below. No discussion or mitigation has been explored for this area and it is recommended that this is undertaken."	made worse by changes to the Proposed Development. As these are existing conditions which are not made functionally worse by the Proposed Development, mitigation measures are not considered required.
17	2.6.2.3	"The strong wind exceedance identified by receptors 367-368 has been recognised within the assessment and management restricted access has been proposed. However, mitigation has not been explored for the exceedances identified on podiums E2 and W2 and the terrace of W1 which have been further discussed below."	This is addressed in Response 11