

Design Note

Project NOMA, 4 Angel Square

Subject Comments in relation to Condition 42 (wind mitigation)

Project no 042512

Date 30 June 2020

Revision	Description	Issued by	Date	Approved (signature)
00	Draft	RS	06/03/2020	BV
01	Comments issued and replied	BV	05/05/2020	GO
02	Updated with results of mitigation test	KK	30/06/2020	RS/BV

1 Introduction

This design note has been prepared in relation to Planning Condition 42, that has arisen as a result of the Wind Microclimate Assessment supporting the planning application for NOMA 4 Angel Square. The Wind Microclimate Assessment was a quantitative CFD (Computational Fluid Dynamics) study that has been attached to the Planning Permission Ref 123437/FO/2019, undertaken to determine if wind comfort and safety conditions would be suitable to carry out the planned pedestrian activities at the Proposed Development Site and surroundings, including the cumulative scenario where committed developments are introduced, such as the New Victoria development adjacent to the Victoria Station. The Wind Microclimate Assessment determined one remaining safety issue adjacent to the Parkers Hotel Apartment building. To resolve this remaining safety issue, Buro Happold has proposed implementation of a planter adjacent to this building, which has been agreed for testing by Manchester City Council (MCC) and assessed in the current study.

1.1 Description of the scheme

The description of the scheme is as follows:

"Demolition of existing industrial buildings and public house to facilitate construction of an 11 storey building with external roof terrace to form a mixed use development comprising office use (Use Class B1) and ground floor commercial units (Use Classes A1, A2, A3, A4, B1 and D2); creation of a new public square and associated landscaping, basement car and cycle parking, provision of plant and servicing and related access and highways' works and associated works".

1.2 Details of the planning condition

The Wind Microclimate Assessment determined that an existing safety issue exists adjacent to the Parkers Hotel Apartment building to the west of the Site on Corporation Street without the Development in place, i.e. it is already there. This was made significantly smaller with the introduction of the Proposed Development and mitigation measures which included tree planting and soft landscaping. However, with the inclusion of the future cumulative developments around

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the Site, this existing safety issue was made worse, in that it was shown to cover a larger area. It was determined that this safety issue was made worse by the introduction of the proposed New Victoria development (this included the New Vitoria scheme without the proposed/ approved wind mitigation scheme) to the southwest of the Site, which will bring prevailing southerly winds from high level down to ground level, which will then accelerate between the Proposed Development and the existing Parkers Hotel Apartment building to the west of the Site.

A planning condition has arisen for the Proposed Development, as follows:

"Prior to any above ground works, a wind mitigation proposal for corporation street shall be submitted for approval in writing by the City Council, as Local Planning Authority. The approved details shall be implemented prior to the first use of the building and thereafter retained and maintained in situ."

2 Wind Microclimate Assessment results and proposed mitigation

2.1 Summary of the Wind Microclimate Assessment undertaken for planning application 2019

The Wind Microclimate Assessment showed that in the baseline (i.e. the existing site with existing surroundings) there are four small areas where the safety criterion is exceeded for the frail and elderly. However, all of these areas are outside the redline boundary of the Site.

With the introduction of the Proposed Development without mitigation, it was shown that two of the safety issues that were highlighted in the baseline scenario (just to the north of the CIS Tower and by the east corner of 1 Angel Square) were removed, which is considered to be a major beneficial effect of the proposals. The other two issues highlighted in the baseline remained the same, with the area at the southeast corner of the Parkers Hotel Apartment building made very slightly larger in terms of the same wind effect experienced over a slightly increased area.

Mitigation measures were then introduced in order to determine their effect on the conditions on and around the Site. Initially, existing landscape around the Site, as well as the proposed landscape strategy for the Site, were included to determine their effect on the local wind speeds and establish if any further wind mitigation measures would be required. The trees adjacent to the train tracks and on top of the unused train tracks to the north of the Site, shrubs at ground-level to the north of the Site, and the significant amount of trees in Angel Meadow to the northeast of the Site, were included in the model as deciduous trees. The deciduous and evergreen trees that form the proposed landscape strategy were also included.

With the inclusion of the mitigation measures, conditions were improved again. Compared to the baseline, it was observed that the existing safety issue adjacent to Mansion Court was also removed completely. This also represents an improvement on the existing scenario. The one remaining safety issue located to the west of the Site, adjacent to the Parkers Hotel Apartment building, was improved through the introduction of the Proposed Development and mitigation measures, as the area of effect associated with the issue was reduced significantly.

The Proposed Development was not shown to introduce any new safety issues and it was concluded that the new development was having major benefits, and the small remaining issue is in practical terms not going to be a problem as it is a small area close to the façade of the building.

There is no knowledge of any wind-related incidents in the existing baseline condition, giving confidence that the remaining issue observed with the Proposed Development and mitigation is likely to be negligible.

A final scenario was modelled, with the inclusion of future cumulative developments surrounding the Site. This showed that the safety issue at the southeast corner of the Parkers Hotel Apartment building was made slightly larger. It was determined that the two taller buildings proposed as part of the future New Victoria development to the southwest of the Site are likely to result in façade downwash and subsequent corner acceleration, as higher-speed winds are brought down to ground level. This is likely to be the main factor contributing to this safety issue.

2.2 Further proposed potential mitigation measures

Based on the previous simulation findings, further mitigation measures were suggested, aimed at eliminating the remaining area that exceeds the safety threshold, i.e. a very small area adjacent to the Parkers Hotel Apartment building. These measures include signage or banners attached to lampposts along Corporation Street, further landscaping or wind screens to the north of the proposed site, or trees in the area of existing shrubs at the northern end of Corporation Street. Before any such measures can be agreed, further quantitative CFD simulations would be required to determine their effectiveness, however, based on our experience, measures incorporated on Corporation Street, close to the area of safety exceedance are likely to be most effective. This means for further mitigation measures to be effective they would have to be positioned outside the redline boundary of the Proposed Development, which is beyond the control of the applicant.

Because further mitigation would be located on a public pavement, outside the redline boundary of the Proposed Development, the type and specific location of the measures will have to be agreed with MCC. There are potential options that could be effective at eliminating the very small remaining area that exceeds the safety threshold.

3 Methodology of the study

3.1 Modelled scenario

It was agreed with MCC that a planter located adjacent to the Parkers Hotel Apartment building would be possible to implement. Based on the agreement with MCC, only one scenario was modelled including the Proposed Development in the context of existing surroundings including the landscape and analysed mitigation. The planter was modelled as shown in Figure 1 below. Figures 2 and 3 show the location of the planter in relation to the Proposed Development Site, on the topographical survey and the landscape general arrangement, respectively.

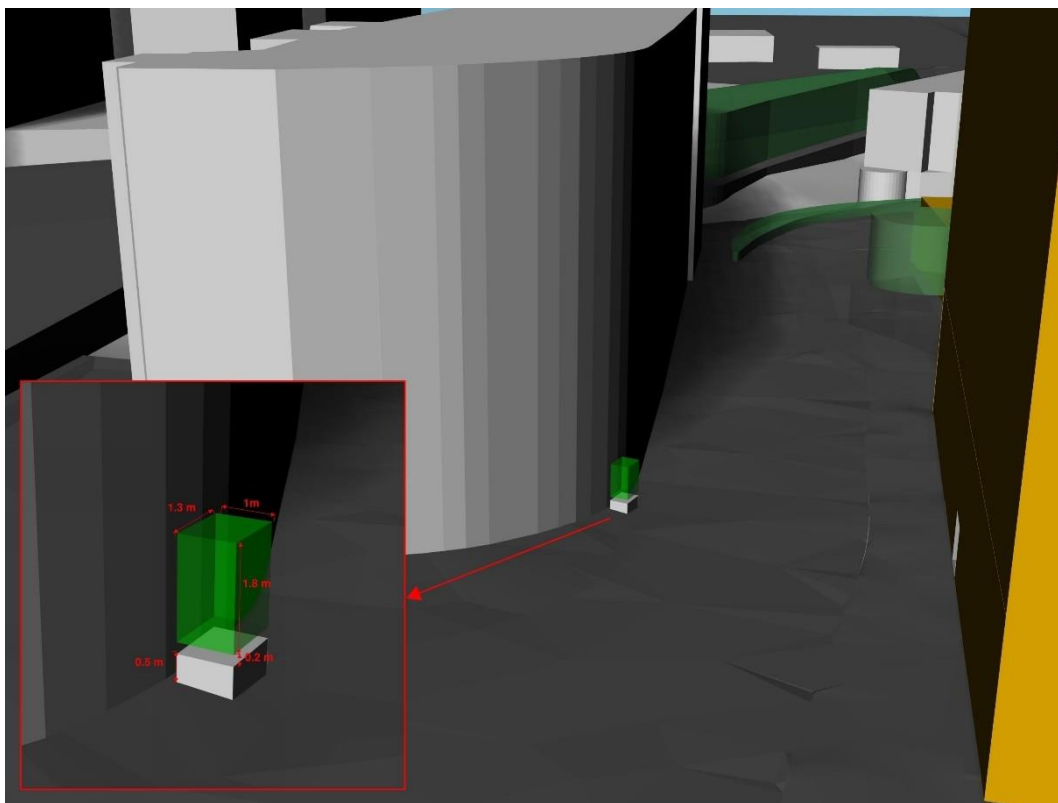


Figure 1 Planter by the Parkers Hotel Apartment building, modelled in the assessment

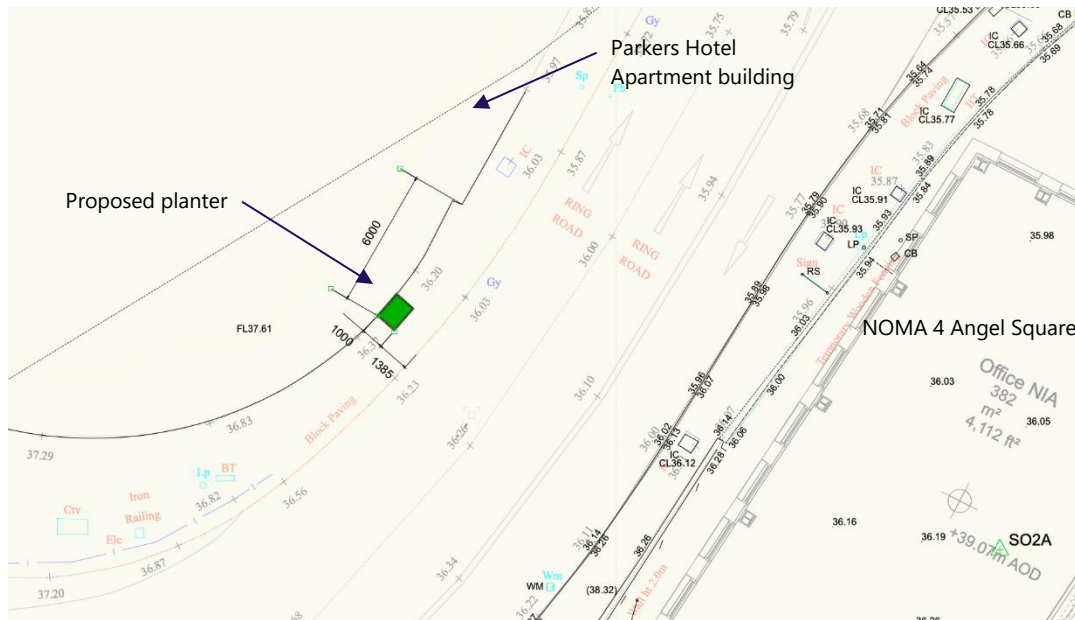


Figure 2 Location of the proposed planter on the topographical survey for the 4 Angel Square site, received from Gardiner & Theobald LLP on 19/06/2020



Figure 3 Location of the proposed planter on the landscape General Arrangement

4 Results of the study

4.1 Summer Comfort Map

Figure 4 presented below shows the comfort conditions around the site in summer. The conditions have not significantly changed compared to the scenario undertaken for the planning application. There is a slight improvement in comfort conditions observed around the area where the planter was implemented.

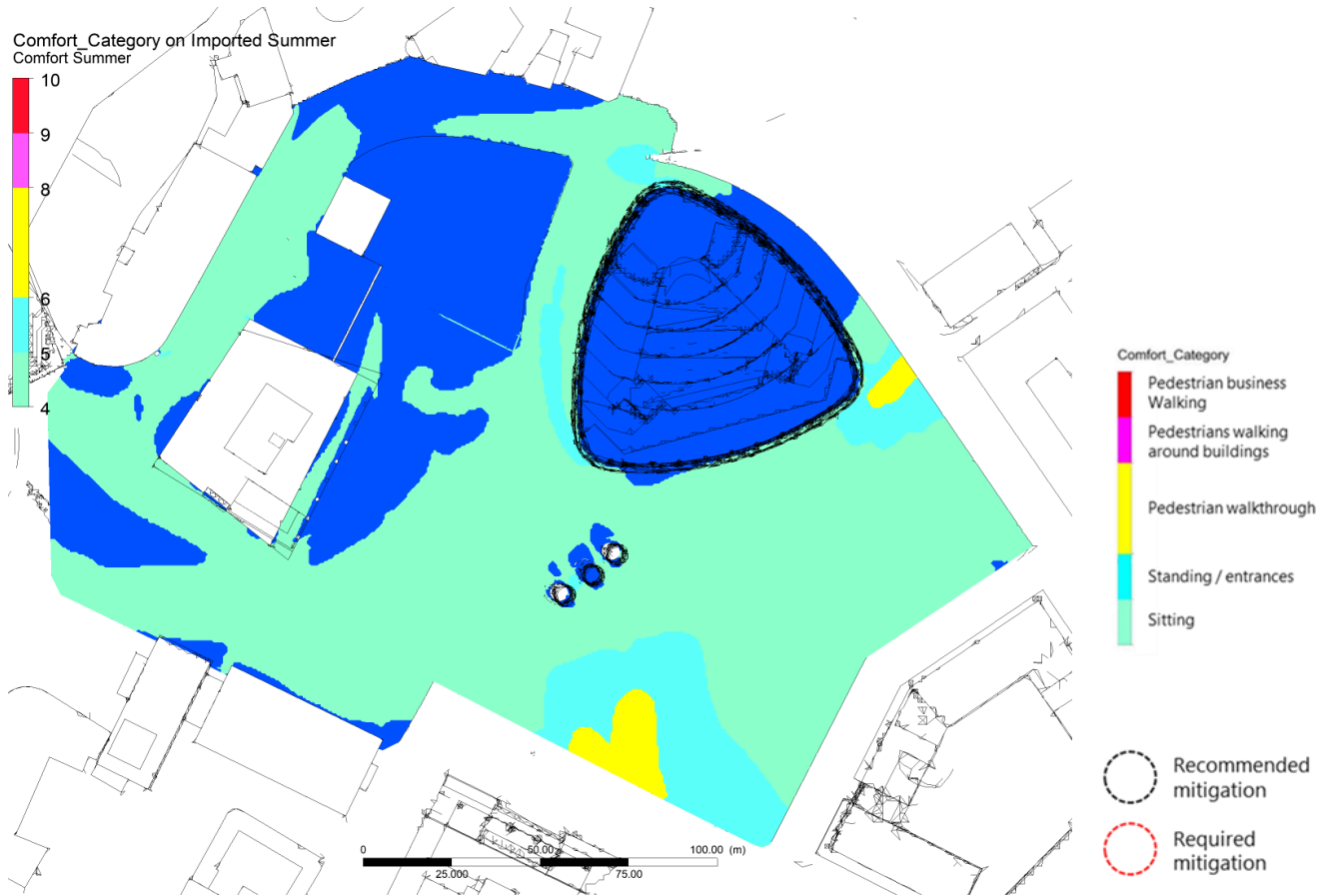


Figure 4 Proposed development with landscape and existing surroundings - summer composite comfort map (12 wind directions)

4.2 Winter Comfort Map

Figure 5 presented below shows the comfort conditions around the site in winter. The conditions remained the same with exception of the area adjacent to the Parkers Hotel Apartment Building along Corporation street, where the conditions have improved from being suitable for walking to standing.

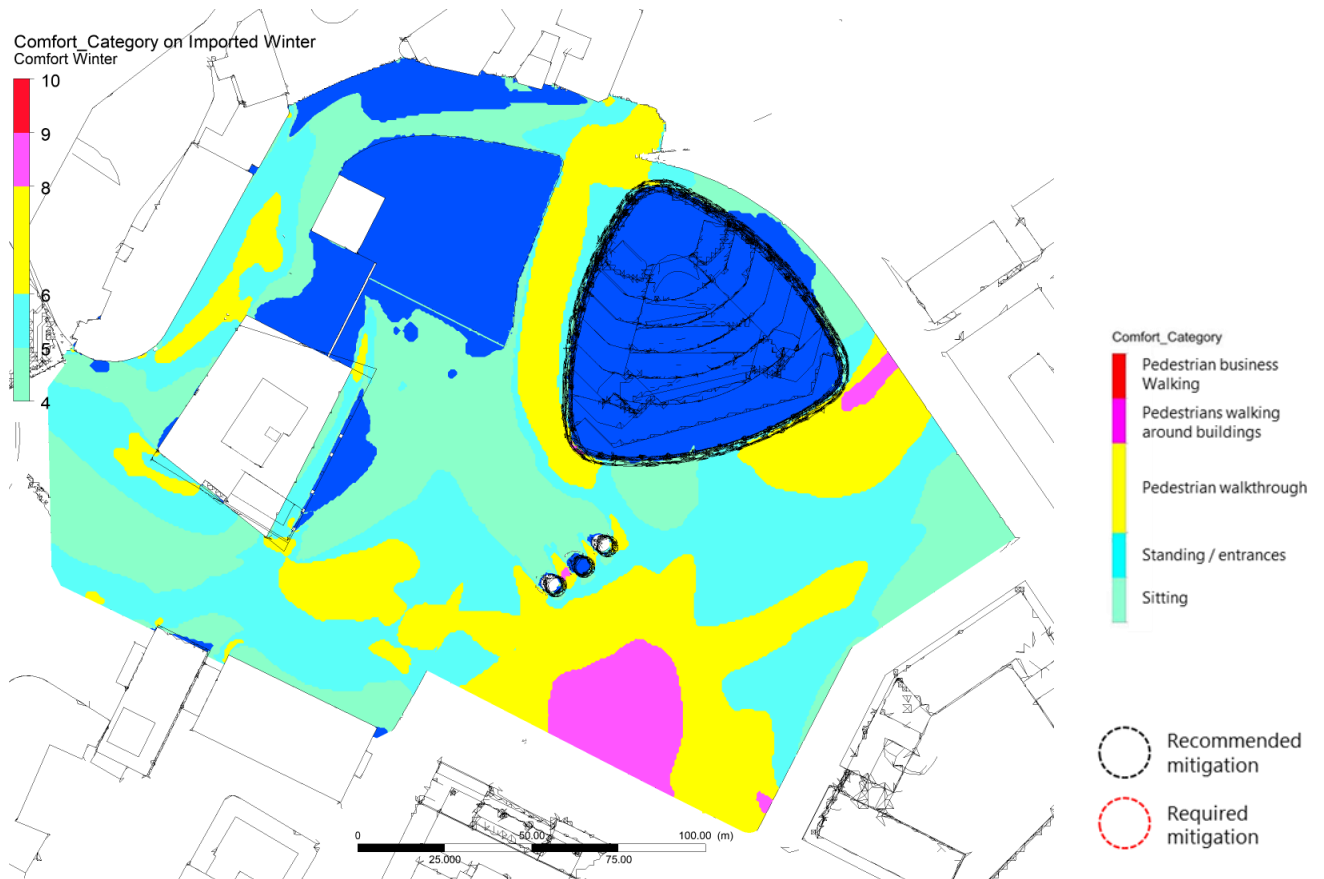


Figure 5 Proposed development with landscape and existing surroundings - winter composite comfort map (12 wind directions)

4.3 Annual Safety Map

Figure 6 shows the improvement in safety conditions, with no remaining safety issues found across the site or its immediate surroundings. Therefore, the implementation of the proposed mitigation (planter located adjacent to the Parkers Hotel Apartment building) was assessed to be sufficient to resolve the safety issue.



Figure 6 Proposed development with landscape and existing surroundings – annual composite safety map (12 wind directions)

5 Conclusions

The Wind Microclimate Assessment undertaken for the NOMA 4 Angel Square development showed that the Proposed Development in the context of existing surroundings with landscape (2019 submission) removed three pre-existing safety issues, and significantly improved the pre-existing safety issue adjacent to the Parkers Hotel Apartment building. This safety issue was seen to be reduced to a very small area, directly adjacent to the façade of this building, where it is unlikely that pedestrians would walk. Therefore, this issue becomes practically negligible.

Following on from the Wind Microclimate Assessment supporting the planning application (2019) another CFD study was undertaken (2020) to assess the impact of the additional proposed mitigation (a planter located adjacent to the Parkers Hotel Apartment building) on resolving the remaining safety issue and therefore Planning Condition 42. This assessment was carried out for one configuration as agreed with the MCC which was the proposed development in the context of surrounding buildings and landscape. The assessment revealed that the proposed mitigation is sufficient to resolve the existing safety issue.

However, in order to resolve the safety issue, the required dimensions of the planter are such that the MCC Highways requirements are not met, i.e. the remaining space available on the pavement after implementation of the planter is approximately 1.4m (compared to the MCC Highways minimum requirement of 1.8m) as seen in Figure 2.

It should be noted that the safety issue by the Parkers Hotel Apartment building results from the exceedance of a wind speed of 15 m/s for approximately 2.5 hrs per year. Moreover, there has not been anecdotal reference of high wind speeds occurring in this location as it stands, i.e. in the baseline scenario which resulted in a larger area of safety exceedance at this location than the scenario including the Proposed Development and landscape. Therefore, it is considered that the safety issue in the studied scenario is low risk even without implementation of the proposed mitigation.