

Environmental Wind Planning Report

Prepared by Arup

Submitted on behalf of Lab Selkirk House Ltd

Selkirk House, 166 High Holborn and 1 Museum Street, 10-12 Museum Street, 35-41 New Oxford Street and 16A-18 West Central Street, London, WC1A 1JR

September 2022

Rev 01

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1. Introduction

An assessment of the effects on wind environment that would arise from the Proposed Development at Selkirk House, 166 High Holborn and 1 Museum Street, 10-12 Museum Street, 35-41 New Oxford Street and 16A-18 West Central Street, London, WC1A 1JR was undertaken by Arup.

The assessment was based on a wind tunnel workshop that was carried out at RWDI Anemos in Milton Keynes on 20 November 2020. The Lawson LDDC criteria¹ for comfort and safety were used to assess acceptability of windiness for intended pedestrian activities.

The wind tunnel study (included in Appendix A) concluded that with the Proposed Development and proposed details of landscaping, ground level windiness around the Site remains generally similar to existing and is suitable for intended pedestrian activities. Increased levels of windiness as compared to existing are measured along West Central Street; local mitigation in the form of a recess has been recommended for primary entrances facing this street.

With tested mitigation measures consisting of trees and a solid balustrade, wind conditions on the upper-level terraces of One Museum Street are found to be generally suitable for short term seating and entrances. Wind conditions on the Vine Lane terrace and within the courtyard of West Central Street at level 1 are also found to be suitable for outdoor seating.

Windiness on the roof terrace of the Post Building immediately to the east of the Site is similar to existing with exception of the western roof section where the local windiness increased by one category. The wind tunnel model included a perimeter balustrade of 1.4m along the terrace perimeter.

A detailed description of this study was summarised in the environmental wind planning report prepared by Arup, dated 24 February 2021. A copy of this report is included in Appendix B of this document.

Following the planning submission, some design changes have been proposed by DSDHA for the One Museum Street and Vine Lane buildings. A desk study assessment has been carried out by Arup to evaluate the impact of these changes on usability of outdoor spaces for pedestrian activities.

The study was based on a review of architectural drawings provided by the DSDHA Architects in June 2022, and our previous experience of wind tunnel testing for the scheme. The desk study has concluded that with the proposed changes to the design, wind conditions around the Proposed Development at ground and the upper levels are likely to remain similar to previously reported or marginally better.

¹ Lawson, T.V., The evaluation of the windiness of a building complex before construction, London Docklands Development Corporation, 1990

2. Design updates

2.1 One Museum Street

The overall height of the One Museum Street block has been reduced by two stories (c. 6245mm). The following additional changes are proposed.

Ground Floor

- (1) The width of colonnade on Museum Street is increased by circa 500mm and the revolving doors (previously projecting into the colonnade) are now recessed
- (2) The outward opening double door entrance to retail space on High Holborn is now set back by 1200mm

Upper Floors

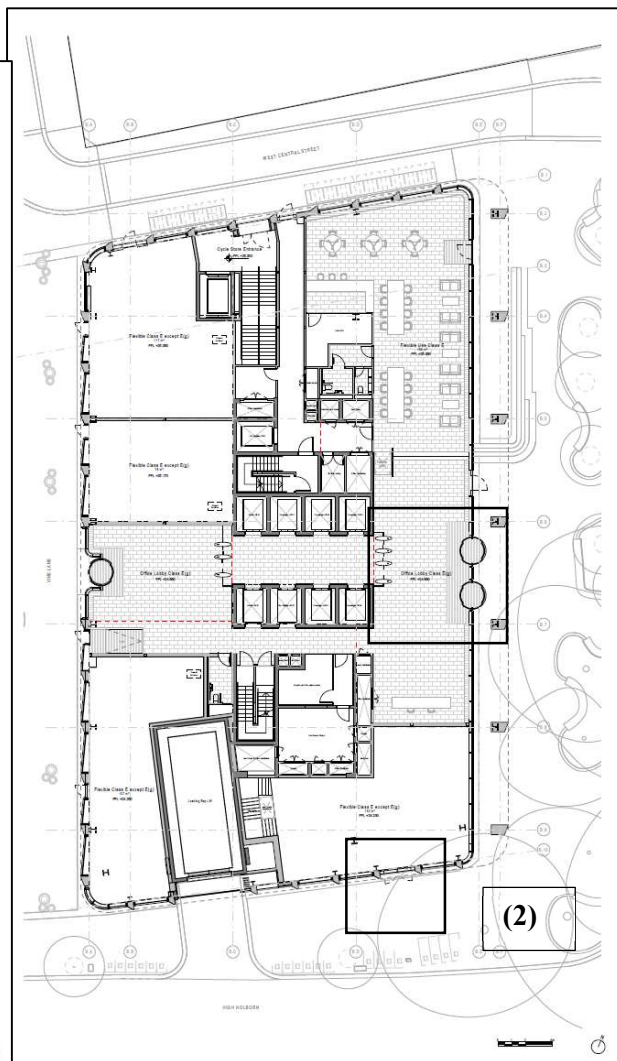
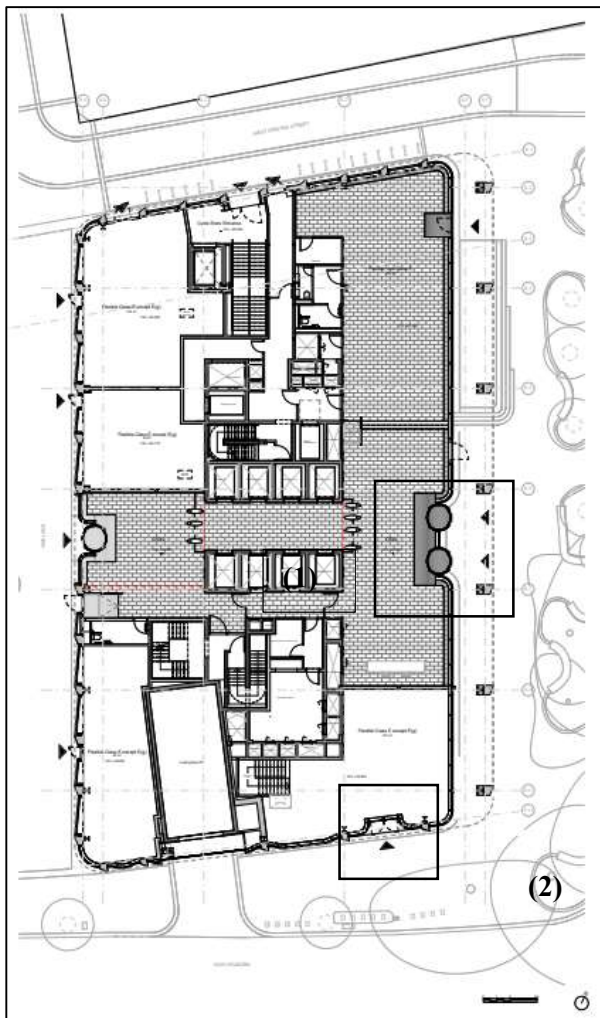
- (3) The massing has been revised along the east/west façade to the upper floors (increased by circa 1500mm to the east from level 8 and above, and by circa 1500mm to the west from level 5 and above)
- (4) The south terraces on all floors of the south facade (except on level 18) are now omitted.

2.2 Vine Lane Building

The overall height of the building remains unchanged. The following changes have been proposed

- (1) Change of use to residential, with commercial / retail use at ground floor
- (2) Inclusion of a ground floor residential entrance on Vine Lane and retail units entrances along Vine Lane and West Central Street
- (3) Inclusion of inset recessed private balconies on the typical residential floors
- (4) Inclusion of a communal terrace as outdoor amenity space with integrated informal play space

Landscaping proposals with the Site boundary and intended use of outdoor spaces remain unchanged.



- (1) The width of colonnade on Museum Street increased by c.500mm and the revolving doors (previously projecting into the colonnade) are now recessed
- (2) The outward opening double door entrance to retail space on High Holborn is now set back by 1200mm

Figure 1: Current (July 2022) ground floor plan of One Museum Street (left); previous (February 2021) ground floor plan of One Museum Street (right)

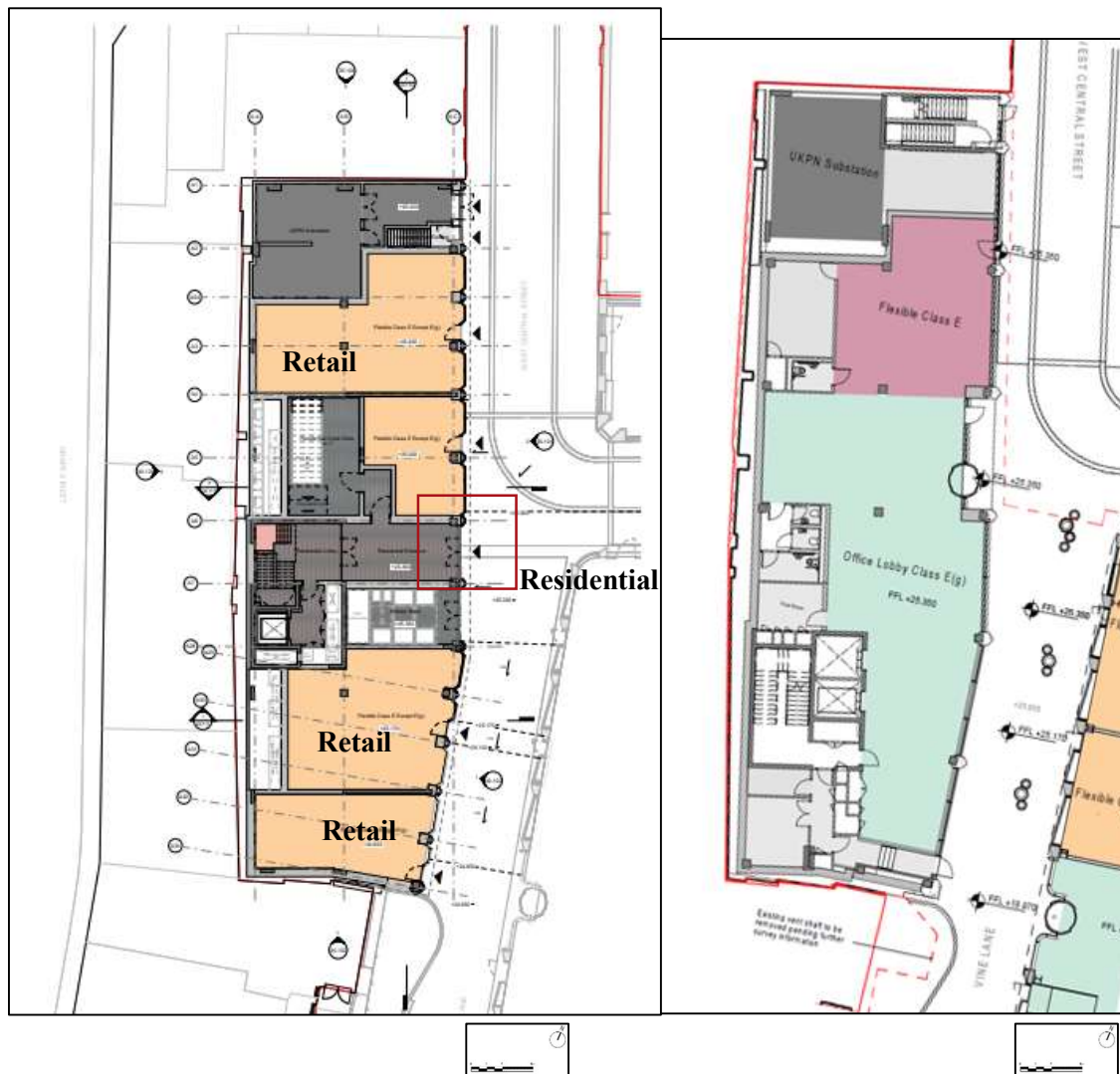


Figure 2: Current (e.g. June 2022) ground floor plan of Vine Lane building (left); previous (e.g. February 2021) ground floor plan of One Museum Street (right)

2.3 Implications of design changes to windiness levels

Ground and upper-level wind conditions as measured in the wind tunnel and as described in the environmental wind planning report (in Appendix B).

With the reduction in height of One Museum Street by two storeys, windiness levels at ground and on the upper levels are likely to remain similar to previously reported or marginally better.

Changes to the configuration of the colonnade (increased in width by c.500mm), to the entrance on Museum Street (now recessed) and to the retail entrance on High Holborn (now set back by 1200m) are also likely to have a beneficial impact on the local wind conditions, as the entrances benefit from an additional degree of sheltering.

Landscaping details on Museum Street remain broadly consistent with earlier proposals as considered for wind tunnel testing. With the proposed landscaping, the local windiness ranges between 'Sitting' to 'Standing', which is acceptable for entrance and pedestrian access use. The main building entrance is recessed and sheltered by the colonnade; changes to the landscaping on Museum Street are not likely to have a significant impact on usability for primary entrance use.

Similarly, the proposed changes to the Vine Lane building are not likely to impact the local windiness which remains acceptable for intended activities. ‘Standing’ conditions are measured on Vine Lane and West Central Street as acceptable for entrance uses. ‘Sitting’ conditions are measured on the roof level of the Vine Lane building which remains acceptable for the proposed use as outdoor amenity space.

2.4 Conclusions

Following the planning submission, some design changes have been proposed by DSDHA to the One Museum Street and the Vine Lane buildings.

A desk study assessment has been carried out by Arup to evaluate the impact of these changes on usability of outdoor spaces for pedestrian activities. The study was based on a review of architectural drawings provided by the DSDHA Architects in June 2022, and our previous experience of wind tunnel testing for the scheme.

The desk study has concluded that with the proposed changes to the design, wind conditions around the Proposed Development at ground and the upper levels are likely to remain similar to previously reported or marginally better.

Appendix A

Wind and Microclimate Report April 2021

Lab Selkirk House Ltd

**Selkirk House, 1 Museum Street,
10-12 Museum Street, 35-41 New
Oxford Street and 16A-18 West
Central Street, London, WC1A
1JR**

Environmental Wind Planning Report

Rev 00 | April 2021

This report takes into account the particular instructions and requirements of our client.

It is not intended for and should not be relied upon by any third party and no responsibility is undertaken to any third party.

Job number 271284-04

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1 Introduction

This report provides an assessment of the effects on the wind environment that would arise from the Proposed Development at Selkirk House, 1 Museum Street, 10-12 Museum Street, 35-41 New Oxford Street and 16A-18 West Central Street, London, WC1A 1JR.

The Proposed Development include:

- **Museum Street** - a single new building rising to 21 storeys, providing office (Class E(g)(i)) accommodation on upper levels and a range of flexible town centre uses (Class E) at ground level.
- **High Holborn** - a single new building rising to 6 storeys, providing residential (Class C3) accommodation on upper levels and a flexible town centre use (Class E) at ground level.
- **Vine Lane** - a single new building rising to 5 storeys, providing office (Class E(g)(i)) accommodation with a flexible town centre use (Class E) at ground level.
- **West Central Street** - a series of new and refurbished buildings rising to 6 storeys, providing residential accommodation on upper levels (Class C3) and flexible town centre uses (Class E) at ground level.

The report describes the methodology and the criteria used to assess acceptability of windiness for intended pedestrian activities; the baseline (e.g. existing site) wind conditions at the application site and surroundings; the wind conditions with the Proposed Development in presence of existing and cumulative surroundings and recommended wind mitigation measures.

2 Methodology

2.1 Measurement Technique

Wind tunnel measurements were carried out at RWDI Anemos in Milton Keynes during a one-day workshop on 20 November 2020. A 1:300 scale model of the site and its surroundings was constructed and positioned in a boundary layer wind tunnel. A photograph of the wind tunnel model is shown in Figure 1.



Figure 1: 1:300 scale wind tunnel model including the Proposed Development and cumulative surroundings (view from south)

Gust and mean wind speeds at pedestrian height were measured using Irwin probes for sixteen equal increments of wind direction. The probes measure wind speeds at an effective height of 1.5m above ground, which is the standard used for assessing wind effects on pedestrians. These are recorded as a ratio compared to a wind speed at a reference location in the wind tunnel which is unaffected by the buildings.

The probe locations were selected either due to wind sensitivity of the expected activity in the area (building entrances, external seating, etc.) or because the site geometry suggested the possibility of undesirable wind conditions.

The wind speed ratios were combined with wind statistics for London, accounting for the variation of wind occurrence and strength with direction, to calculate seasonal and annual levels of windiness according to the 'comfort' and 'distress' limits in the Lawson Criteria.

The Lawson Criteria define appropriate levels of windiness according to the type of activity being performed in an area and levels of windiness that may cause distress. The windiness at measurement locations has been expressed in terms of these activity limits.





2.2 LDDC Lawson Assessment Criteria

The criteria used to describe windiness in this study are those of T.V. Lawson LDDC¹. The acceptability of windiness is subjective and depends on a number of important factors, particularly the type of activity being performed. The Lawson criteria describe acceptability for particular activities in terms of ‘comfort’ and ‘distress’ (or safety).

The Lawson comfort criteria are used to describe frequent wind conditions and specify tolerable limits for various every-day activities. For ideal conditions, it would be desirable to achieve a category better than the comfort categories described below (i.e. tolerable conditions at a building entrance will be in the ‘Standing’ range but ideal conditions will be in the ‘Sitting’ range). For more sensitive activities, such as regular use for external eating, conditions should be well within the ‘Sitting’ category.

Acceptable conditions for various activities in order of increasing windiness are described in Table 1 below. The coloured dots are used to indicate the windiness on the referenced figures, e.g. Figure 5, which also show the measurement locations.

Table 1: Lawson Comfort Criteria

Comfort Criteria		Description
Long-term ‘Sitting’		Reading a newspaper, eating and drinking
‘Standing’ or short-term sitting		Bus stops, window shopping, building entrances ⁽¹⁾ , and parks
Walking or ‘Strolling’		General areas of walking and sightseeing
Business ‘Walking’		Areas where people are not expected to linger
(1) The use of this criterion for entrances is to avoid difficulties with maintaining balance when transitioning from a sheltered indoor location.		



The comfort criteria above describe more frequent wind conditions. There is also a distress criterion for ‘General Public Access’, equivalent to a mean speed of 15 m/s and a gust speed of 28 m/s (62 mph) to be exceeded less often than once a year. Exceeding this limit signifies a safety hazard for less able-bodied members of the public (e.g. elderly and cyclists). Conditions in excess of this limit may be acceptable for optional routes and routes which less physically able individuals are unlikely to desire to use in windy weather.

There is a further limiting distress criterion within which even ‘able-bodied’ individuals may find themselves in difficulties at times. This corresponds to a mean speed of 20 m/s and a gust speed of 37 m/s (83 mph) to be exceeded less

¹ **Lawson, T.V.**, *The evaluation of the windiness of a building complex before construction*. London Docklands Development Corporation, 1990

often than once a year. Gust speeds are likely to exceed body weight, where it becomes difficult for most to remain standing, on several occasions a year. Such speeds may also affect safe operation of some road vehicles, particularly unloaded goods vehicles. The pedestrian safety criteria are provided in full in Table 2.

Table 2: Lawson Distress Criteria

Distress Criteria		Description
‘General Public’ Access		Limiting condition for everyday access routes for the general public, including the less able and cyclists.
‘Able-Bodied’ Access		Within which access may be difficult for some at times of general windiness
‘Controlled Only’ Access		Access may need to be restricted for safety in strong winds. Cross-winds may also affect vehicles.

2.3 Wind Climate

The strength and directionality of the winds at the site are fundamental aspects of the environmental wind assessment. The wind statistics for London were based on historical wind data from Holborn Weather Centre as peer reviewed for the Lawson LDDC criteria. These are corrected for conditions over the site. The key aspects of the wind climate in London are as follows:

The southwest winds are the most frequent and strongest winds in the UK at all times of the year, blowing from a quadrant centred on west south-west. These winds are relatively warm and wet. Most cases of serious annoyance due to strong winds around buildings are caused by these winds.

During spring, northeast winds are almost as common as the southwest winds but are weaker. They are often associated with cold, dry conditions. These winds can be more unpleasant than their strength suggests due to the lower-than-average air temperature.

Northwest winds from can be as strong as the southwest winds but are less frequent. They are also relatively cold. Finally, southeast winds are generally warm and light and are rarely associated with annoying ground level winds.

The areas around the proposed development are accessed by pedestrians at all times of the year. Therefore, the environmental wind assessment has been based on the worst season and summer results.

3 Summary of Wind Tunnel Test Results

3.1 Existing Site (Baseline)

The site is bounded by High Holborn to the south, Museum Street to the east and New Oxford Street to the north, with the rear of the properties fronting Grape Street forming the western boundary. West Central Street dissects the site and separates out Selkirk House from the New Oxford Street and West Central Street block (known as the West Central Street component of the site). Selkirk House comprises a 17-storey building, which includes two basement levels, and a further partial basement level. Selkirk House is occupied by the former Travelodge hotel building and NCP car park. The Post Building immediately to the east of the site is similar in height to the Travelodge.

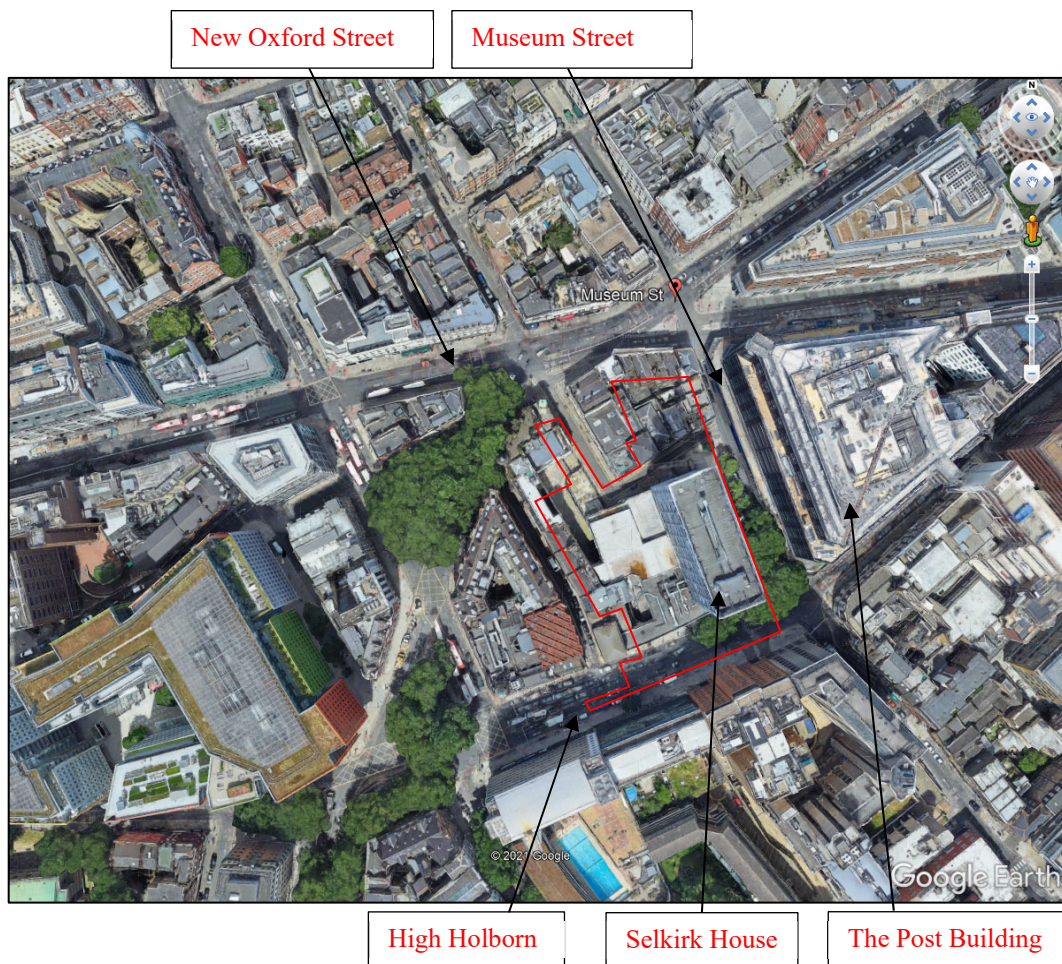


Figure 2: Satellite view of the existing site (view from top)

Views of the baseline wind tunnel model are shown in Figure 3 to Figure 6. The model included the existing building on-site with existing surroundings and existing landscaping features.



Figure 3: Wind tunnel model of the Existing Baseline, view from south

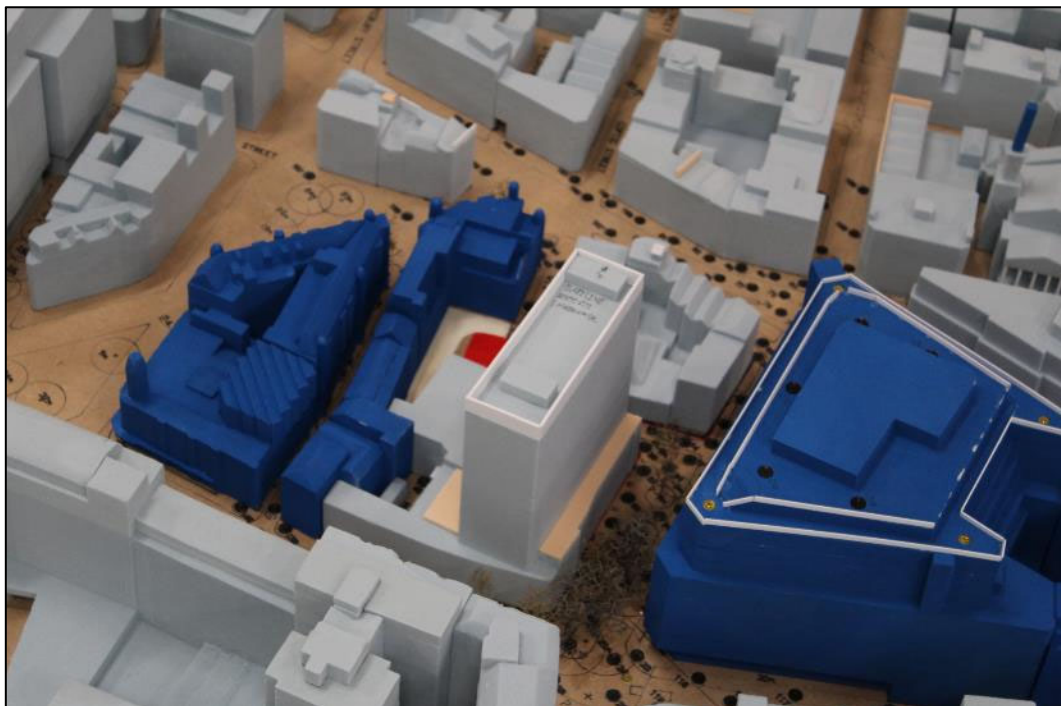


Figure 4: Wind tunnel model of the Existing Baseline. Close up view from south-east



Figure 5: Wind tunnel model of the Existing Baseline. Close-up view from north-east



Figure 6: Wind tunnel model of the Existing Baseline. Close-up view from north-west

‘Worst’ and summer season results at ground level are shown in Figure 7 and Figure 8. In the worst season, wind conditions in and around the proposed site range between ‘Sitting’ or ‘Standing’.

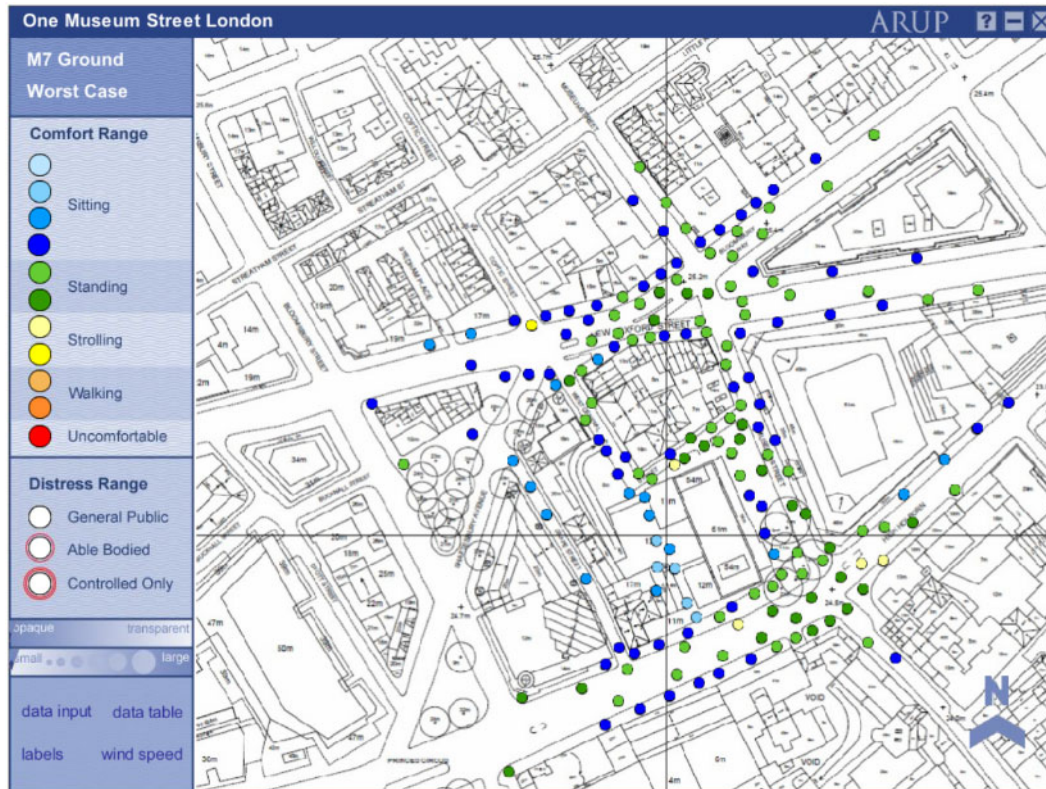


Figure 7: Baseline 'worst' season results, site-wide

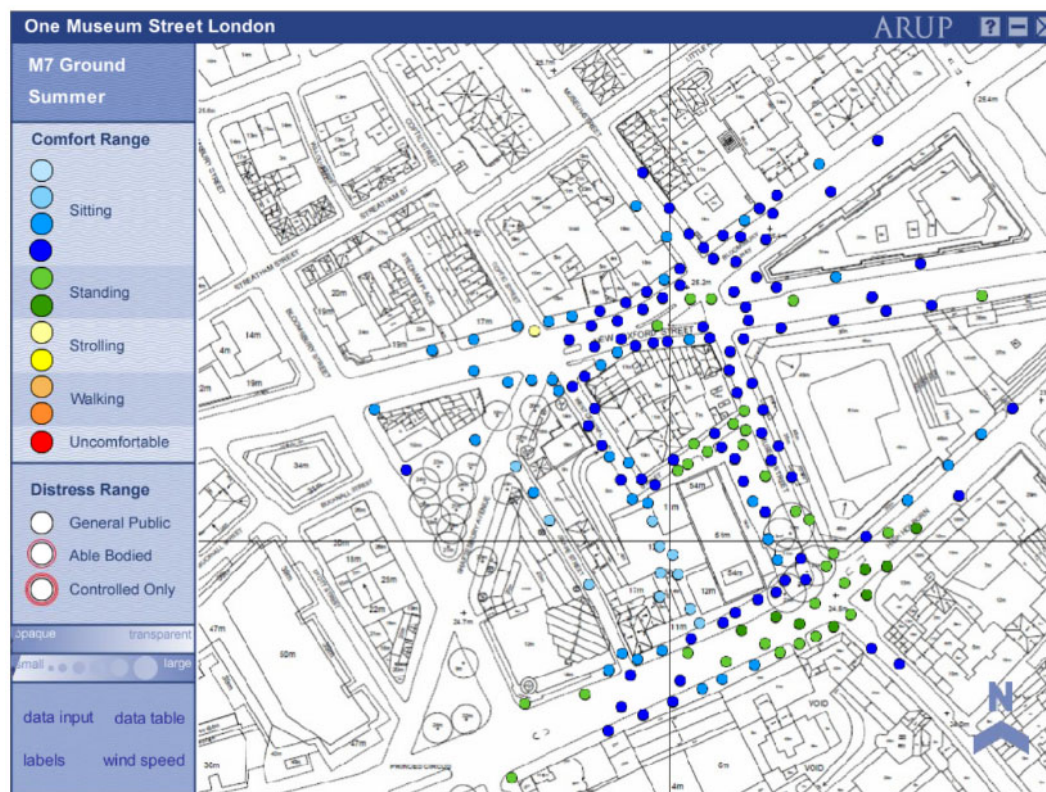


Figure 8: Baseline summer results, site-wide

Windiness levels in key areas are discussed below.

3.2 On-site wind conditions

Entrances

In the ‘worst season’, wind conditions at entrances on Museum Street, West Central Street, New Oxford Street and High Holborn are ‘Sitting’ or ‘Standing’, which is suitable for entrance use.

Pedestrian Access Routes

‘Worst season’ wind conditions on pedestrian access routes through the site, along West Central Street and Museum Street are predominantly ‘Standing’, which is suitable for general access.

3.3 Off-site wind conditions

Entrances

‘Worst season’ conditions at entrances to businesses and properties on the north side of New Oxford Street and the south side of High Holborn are ‘Sitting’ or ‘Standing’, which is suitable for entrances.

Pedestrian Access Routes and Crossings

‘Worst season’ conditions along the roads surrounding the site are ‘Sitting’ or ‘Standing’, with three locations of ‘Strolling’ on High Holborn.

‘Worst season’ conditions at the pedestrian crossings at the north and south ends of Museum Street are ‘Standing’. ‘Strolling’ is observed at the pedestrian crossing at the south end of Coptic Street.

The above conditions are suitable for intended pedestrian access.

Cycling Routes

‘Worst season’ conditions along the roads surrounding the site are ‘Sitting’ or ‘Standing’, with isolated areas of ‘Strolling’. This is acceptable for cycling uses.

Upper Terraces

The Post Building, to the east of the site, includes a terrace at roof level. In the ‘worst season’, conditions on the roof terrace are ‘Standing’ or ‘Strolling’; conditions are ‘Standing’ to lower ‘Strolling’ in the summer season.

A solid parapet (1.4m tall) was modelled along the perimeter of the roof.



Figure 9: 'Worst' and summer season baseline conditions on the roof terrace of the Post Building

3.4 Proposed Development in Existing Surroundings

Figures 10-12 show the wind tunnel model of the Proposed Development in existing surroundings.



Figure 10: Wind tunnel model of the Proposed Development with Existing Surroundings (view from South)

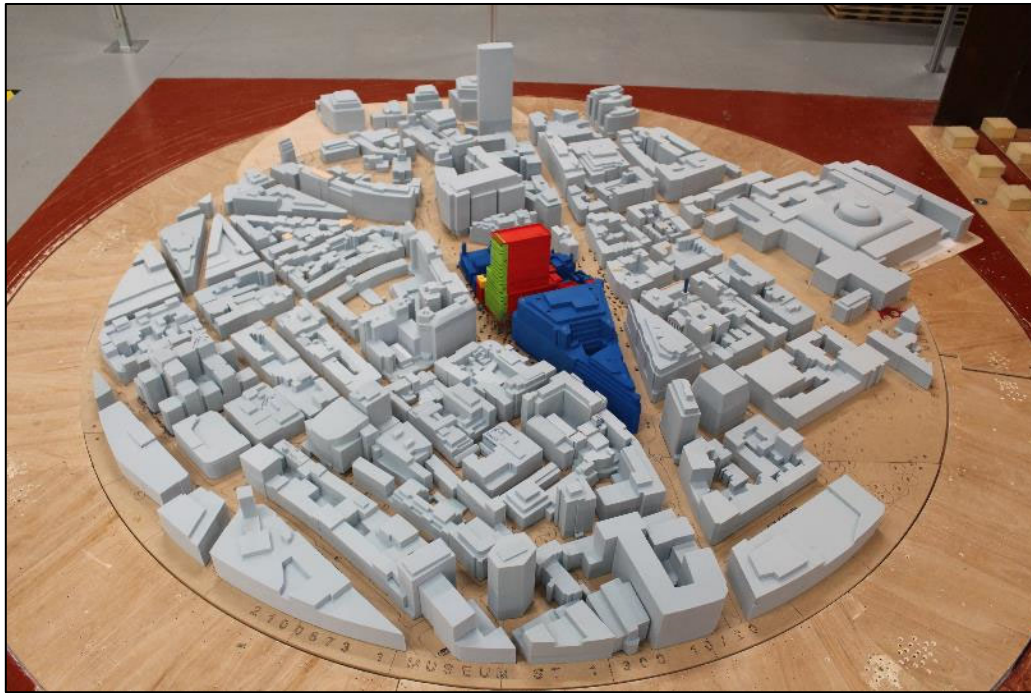


Figure 11: Wind tunnel model of the Proposed Development with Existing Surroundings (view from East)



Figure 12: Wind tunnel model of the Proposed Development with Existing Surroundings (view from North)

Existing and proposed landscaping details at ground level were included in the test model.

On Museum Street, minor differences are noted between the currently proposed landscaping scheme (Figure 13, top) and the scheme which informed the wind

tunnel model (Figure 13, bottom). However, these differences are not considered to influence the local windiness significantly.

It is also noted that the currently proposed landscaping scheme shall be treated as indicative.

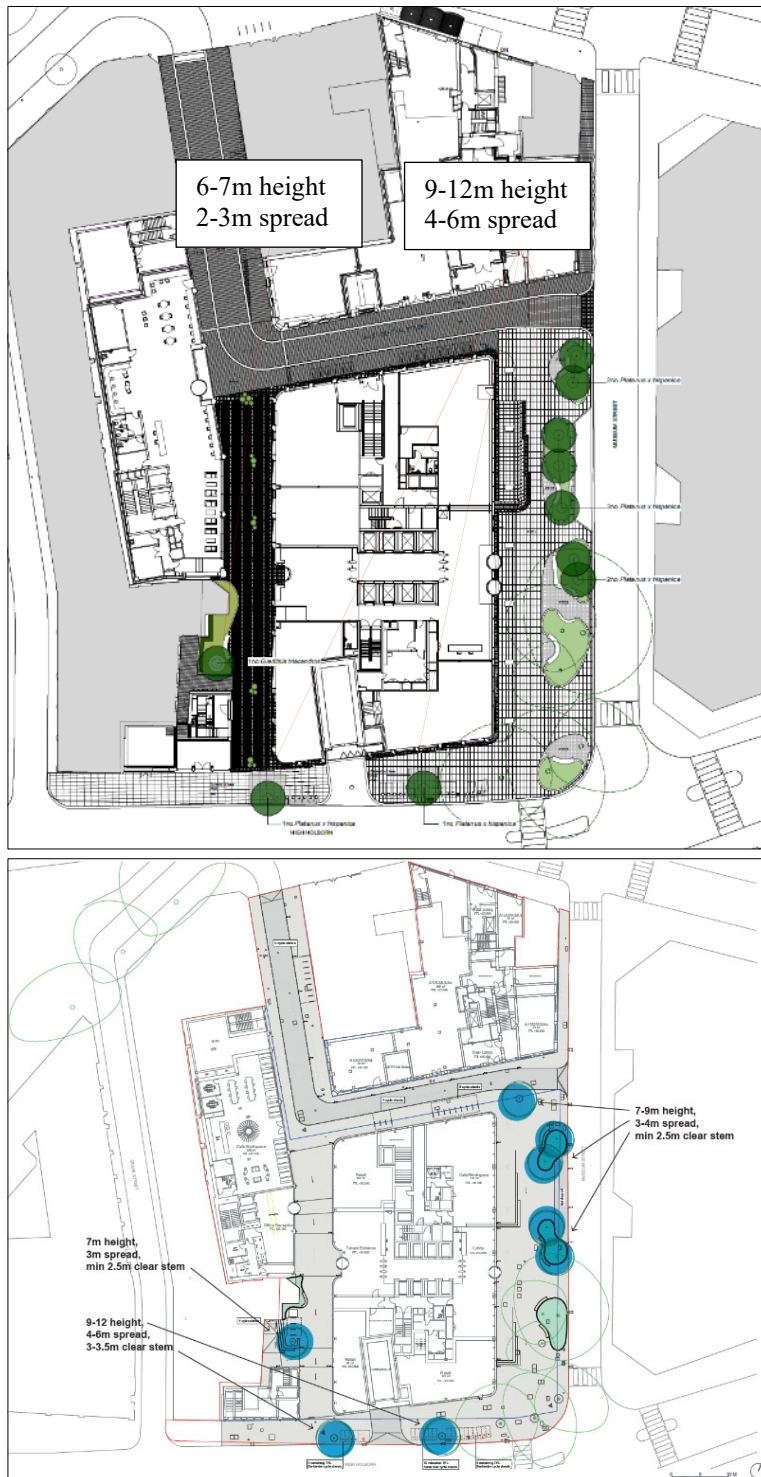


Figure 13: Proposed indicative ground landscaping layout (top); landscaping layout which informed modelling in the wind tunnel (bottom)

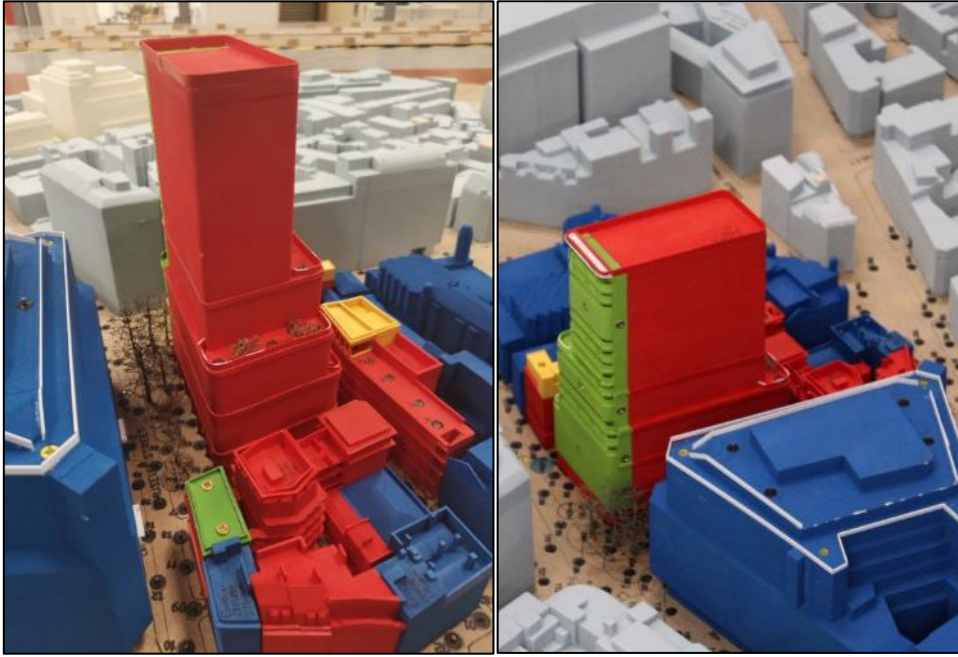


Figure 14: Close-up view of the wind tunnel model showing details of modelled landscape along Museum Street and High Holborn

Proposed landscaping details as shown in Figure 15 were modelled on the upper terraces at level 8 and 11. A 1.4m balustrade was modelled along the perimeter of the terraces at level 5, 8 and 11.



Figure 15: Landscaping layout on Level 8 and 11 terraces at One Museum Street



Figure 16: Image of the wind tunnel model showing trees on the upper level terraces; the height of the perimeter balustrade was modelled at 1.4m on all terraces

Landscape details for the courtyard of West Central Street at level 1 as shown in Figure 17 (left) were conservatively omitted from the test model.



Figure 17: (Left) plan of proposed landscaping on Level 1 Courtyard at West Central Street; (right) view of the wind tunnel model excluding the local landscaping

No landscaping details were modelled on the roof terrace of Vine Lane.

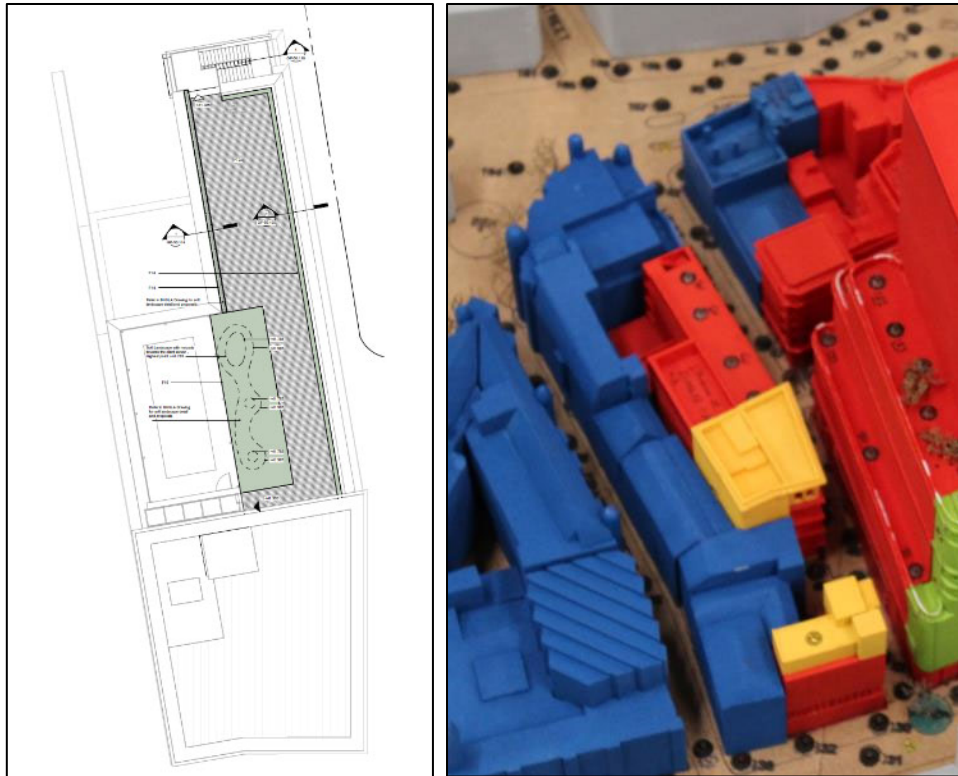


Figure 18: (Left) plan of proposed landscaping on the Vine Lane roof terrace; (right) view of the wind tunnel model

3.4.1 Ground Level

‘Worst’ and summer season results at ground level are shown in Figure 19 and Figure 20. In the ‘worst’ season, wind conditions in and around the proposed site are generally ‘Sitting’ or ‘Standing’, with isolated areas of ‘Strolling’.

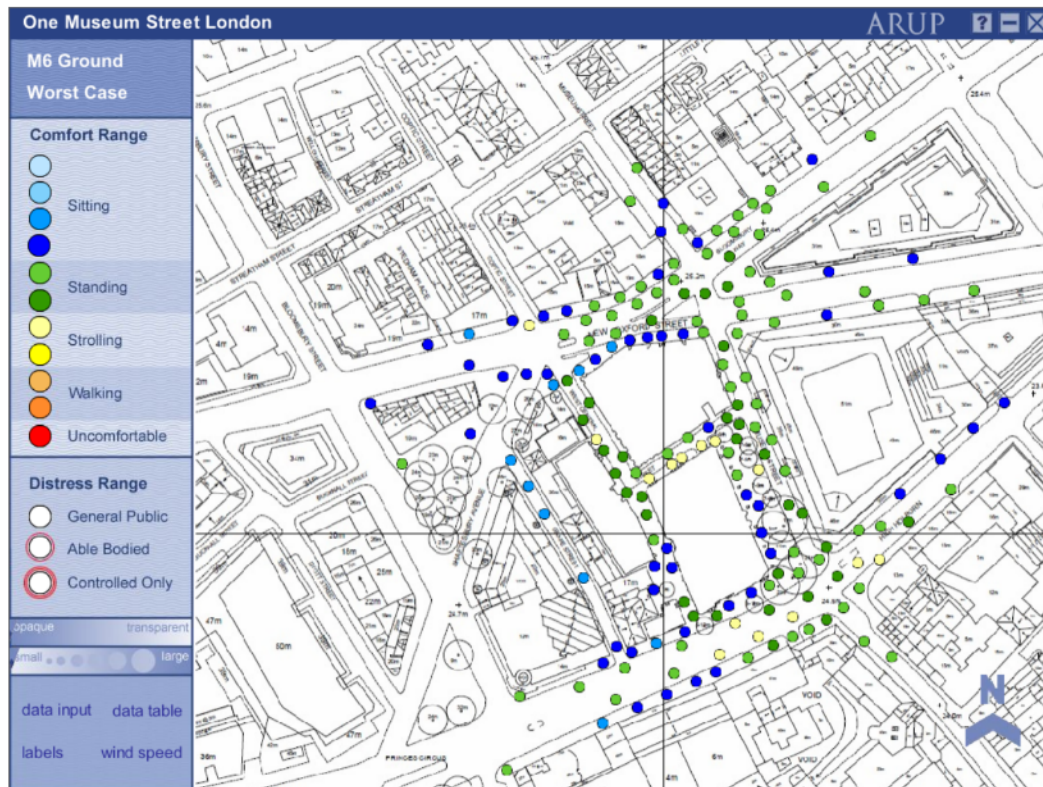


Figure 19: Proposed Development with Existing Surroundings worst case season results (Ground Level)

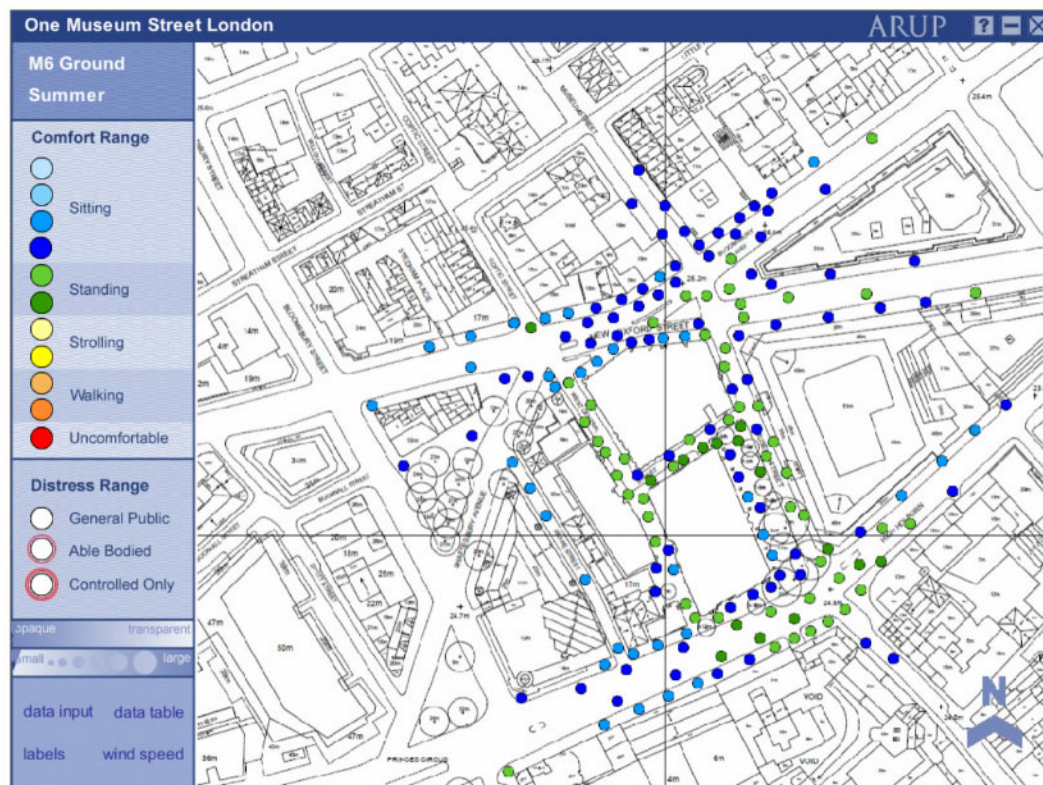


Figure 20: Proposed Development with Existing Surroundings Summer season results (Ground Level)

Entrances

Proposed entrance locations at ground level are labelled in Figure 21.

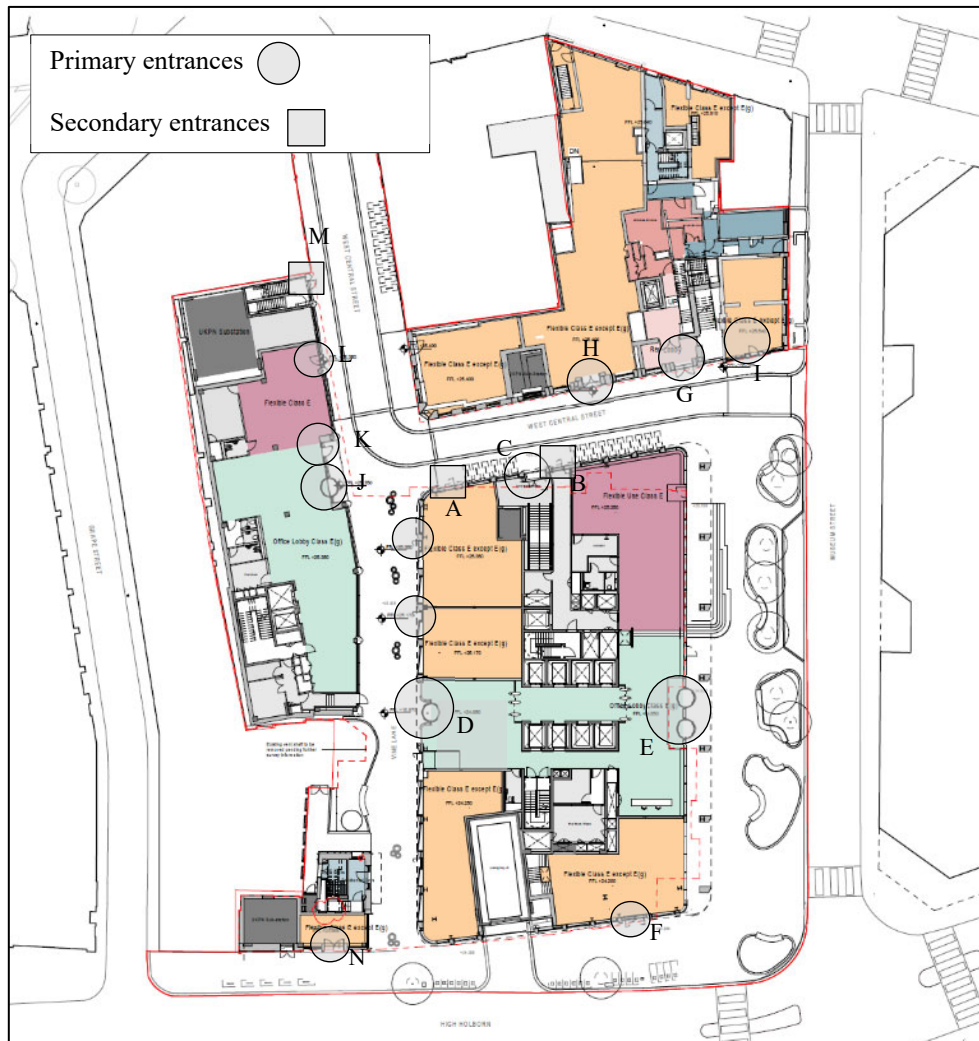


Figure 21: Mark-up of entrance locations

Windiness levels at ground level entrance locations are discussed in Table 3.

Entrance Location	Measured wind conditions	Mitigation Recommended
'A', 'B': secondary entrances to the One Museum Street block, facing West Central Street	'Strolling'	This would be suitable for entrances which are not used regularly. No mitigation is recommended.
'C': cycle entrance to the One Museum Street block, facing West Central Street	'Strolling'	This would not be suitable for a regularly used entrance. An entrance recess by 1m is recommended.
'D', 'E': main entrances to the One Museum Street block facing Vine Lane and Museum Street respectively	Upper 'Sitting'	This would be suitable for entrances which are used regularly. No mitigation is recommended.

Other entrances to One Museum Street block facing Vine Lane	‘Standing’	This would be suitable for entrances which are used regularly. No mitigation is recommended.
‘F’: southern entrance to the One Museum Street block facing High Holborn (labelled as ‘F’)	Upper ‘Sitting’	This would be suitable for entrances which are used regularly. No mitigation is recommended.
‘G’: middle southern entrance to the West Central Street block	‘Strolling’	This would not be suitable for a regularly used entrance. An entrance recess by 1m is recommended.
‘H’, ‘I’: remaining southern entrances to West Central Street block	‘Sitting’ to ‘Standing’	This would be suitable for entrances which are used regularly. No mitigation is recommended.
‘J’, ‘K’, ‘L’: entrances to the Vine Lane block facing Vine Lane	‘Standing’	This would be suitable for entrances which are used regularly. No mitigation is recommended.
‘M’: entrances to the Vine Lane block facing Vine Lane	Lower ‘Strolling’	This would be suitable for entrances which are not used regularly. No mitigation is recommended.
‘N’: southern entrance to the High Holborn block	Upper ‘Sitting’	This would be suitable for entrances which are used regularly. No mitigation is recommended.

Table 3: Summary of windiness levels and recommended mitigation at proposed entrance locations

Pedestrian Access Routes

Conditions along the access routes on Vine Lane, Museum Street, High Holborn and New Oxford Street are ‘Sitting’ to ‘Standing’ which is acceptable for access.

Conditions on West Central Street are ‘Strolling’, which remains suitable for access.

3.4.2 Upper Levels

With tested landscaping and balustrade details, ‘worst’ season windiness on the terraces of One Museum Street is ‘Standing’, with isolated areas of ‘Strolling’ around the north corners of the terraces at level 5 and 11. Conditions are improved to ‘Sitting’ or ‘Standing’ in the summer season. These conditions would be generally acceptable for short term seating. It is noted that a roof pergola has been positioned within the north portion of the terrace at level 11; this area would be suitable for short term seating only in the summer season. ‘Standing’ conditions are measured at the terrace entrance locations which is suitable for intended uses.

‘Worst’ and summer season windiness on the terrace of the Vine Lane block is ‘Sitting’. This would be acceptable for regular outdoor seating.

‘Worst’ and summer season conditions on the West Central Street courtyard at level 1 are ‘Sitting’ to ‘Standing’. This would be generally acceptable for short term seating.

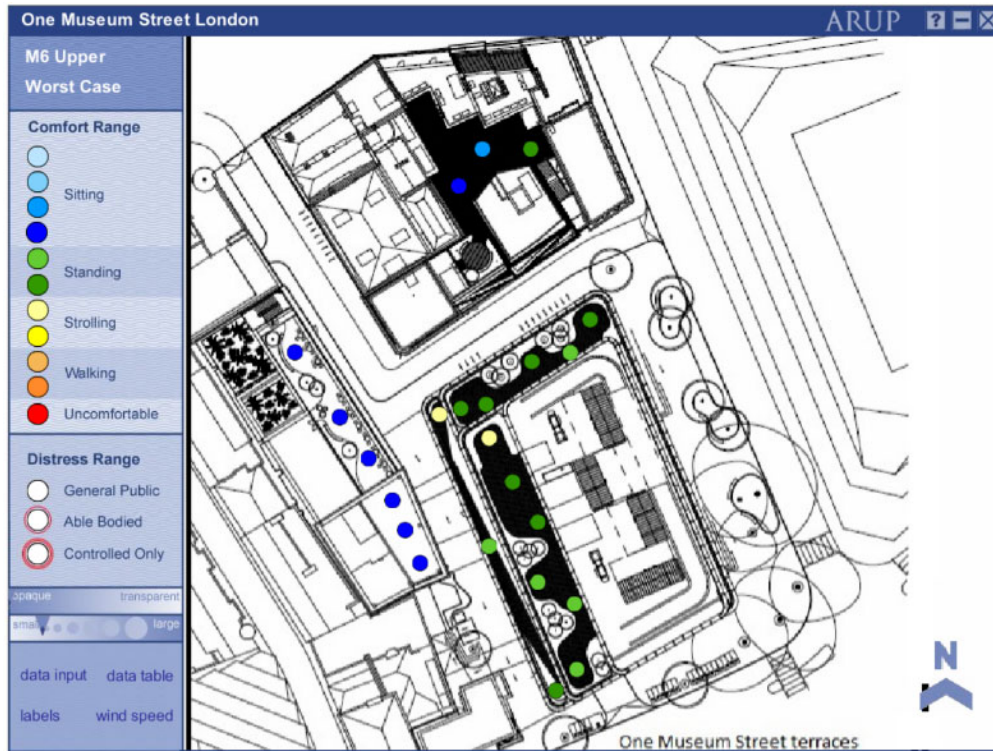


Figure 22: Proposed Development with Existing Surroundings worst case season results (upper levels)

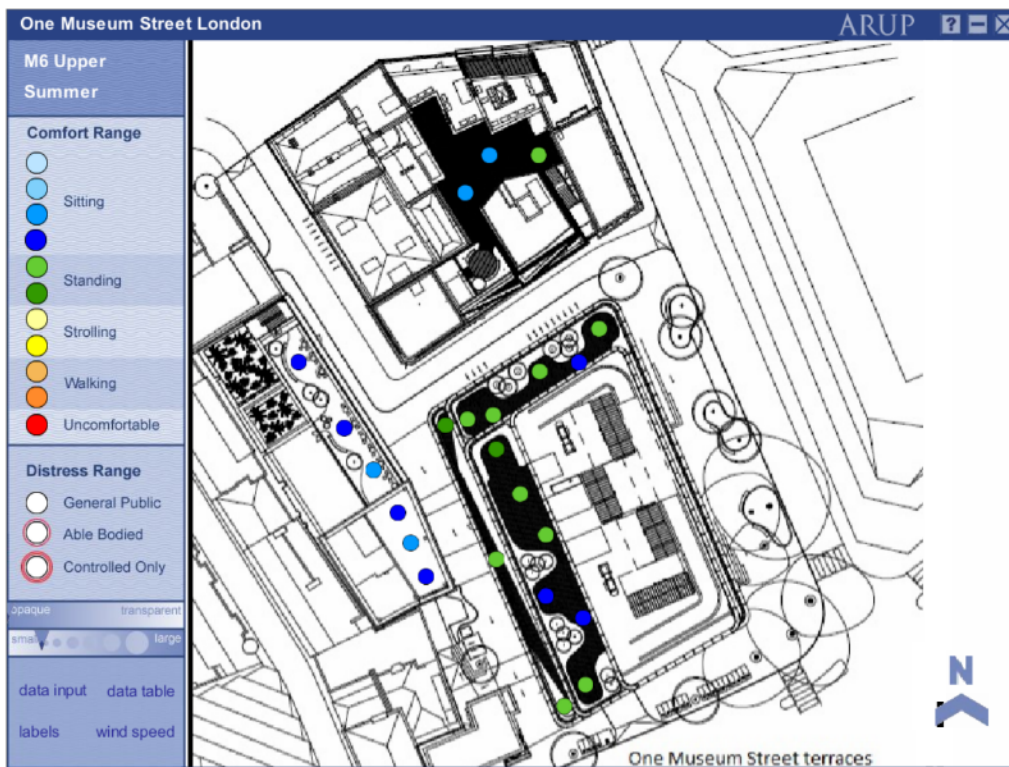


Figure 23: Proposed Development with Existing Surroundings Summer season results (upper levels)

3.4.3 Off-site wind conditions

Entrances

‘Worst’ season conditions at entrances to businesses and properties on the north side of New Oxford Street and the south side of High Holborn are generally ‘Standing’, which is suitable for entrances and similar to existing.

Pedestrian Access Routes and Crossings

‘Worst’ season conditions along the roads surrounding the site are generally ‘Standing’, with isolated areas of ‘Strolling’.

Wind conditions at the pedestrian crossings at the north and south ends of Museum Street are ‘Standing’.

At the pedestrian crossing at the South end of Coptic Street, conditions are ‘Strolling’.

The above conditions are suitable for access and similar to existing.

Cycling Routes

Wind conditions along the roads surrounding the site are generally ‘Standing’, with isolated areas of ‘Strolling’. This is acceptable for intended cycling and similar to existing.

Upper Levels

Windiness on the roof terrace of the Post Building immediately to the east of the Site is similar to existing with exception of the western roof section where the ‘worst season’ windiness is increased by one Lawson category (from ‘Strolling’ to ‘Business Walking’) at one location; however the summer season windiness on this terraces remains within the same Lawson categorisation as existing.

The wind tunnel model included a perimeter balustrade of 1.4m along the terrace perimeter.



Figure 24: ‘Worst’ and summer season conditions on the roof terrace of the Post Building in presence of the Proposed Development in existing surroundings

3.5 Proposed Development in Cumulative Surroundings

Figures 25 and 26 shows the wind tunnel model of the Proposed Development with Cumulative Surroundings. Existing and proposed landscaping details were included in the test model.

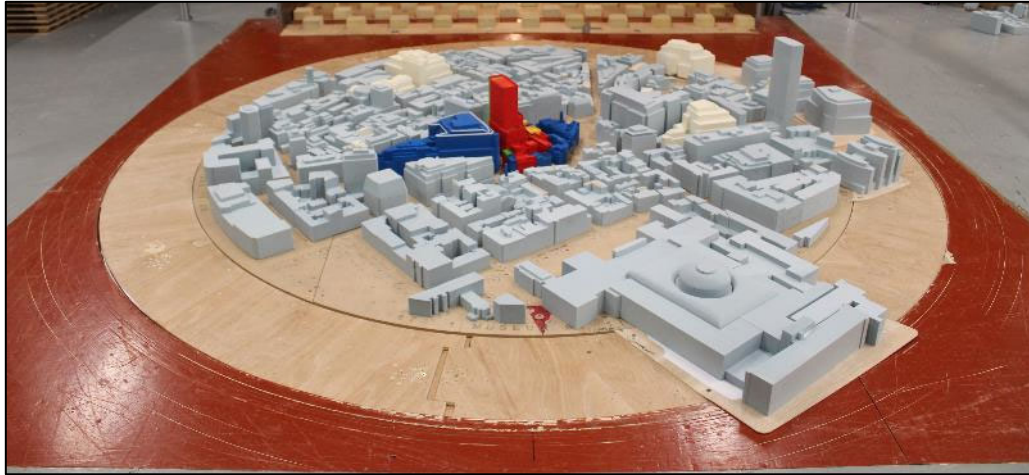


Figure 25: Wind tunnel model of the Proposed Development with Cumulative Surroundings indicated by cream-coloured buildings (view from the North)



Figure 26: Wind tunnel model of the Proposed Development with Cumulative Surroundings indicated by cream-coloured buildings (view from the East)

Measured wind conditions with cumulative surroundings which are sufficiently distant from the Site remain similar as with existing surroundings.

‘Worst’ and summer season wind conditions at ground level are shown in Figures 27-28. Upper level wind conditions are shown in Figure 29-31.

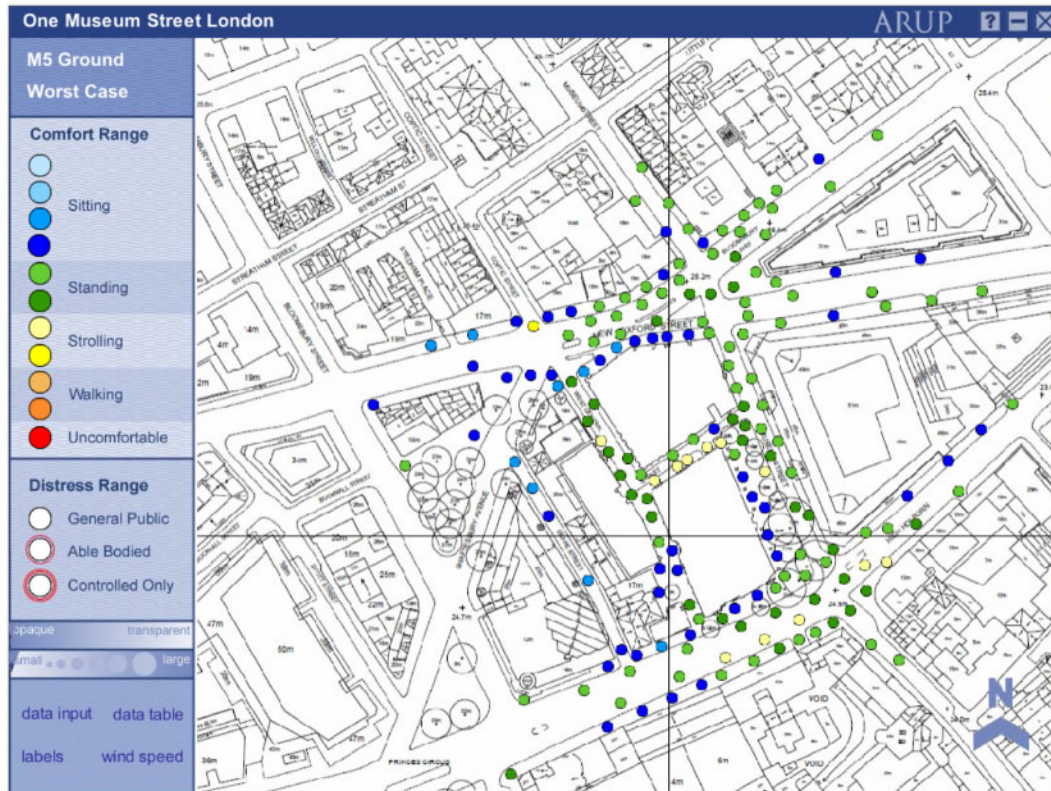


Figure 27: Proposed Development with Cumulative Surroundings worst case results (Ground level)

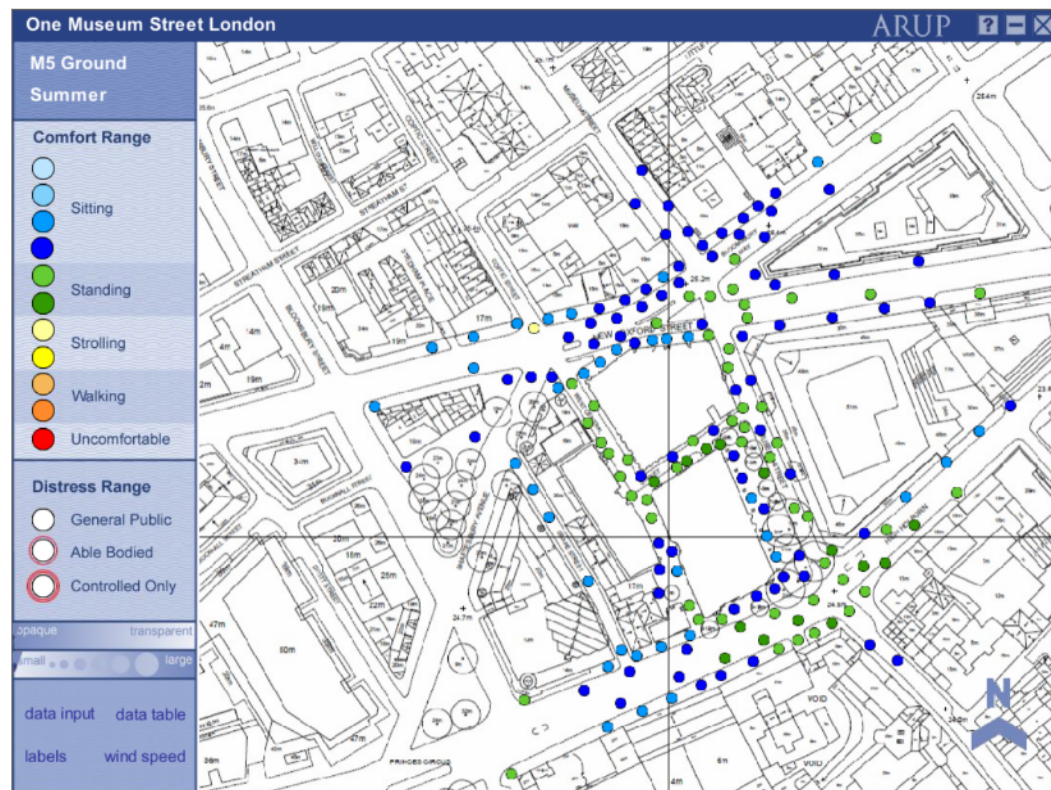


Figure 28: Proposed Development with Cumulative Surroundings Summer results (Ground level)

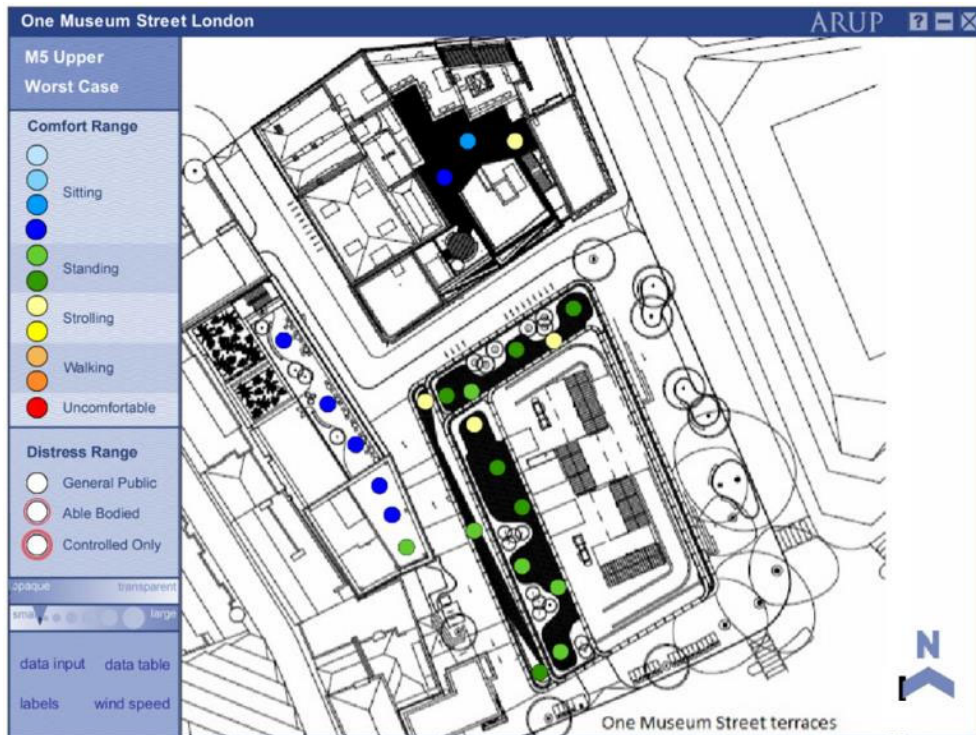


Figure 29: Proposed Development with Cumulative Surroundings worst case results (Terraces and Courtyard)

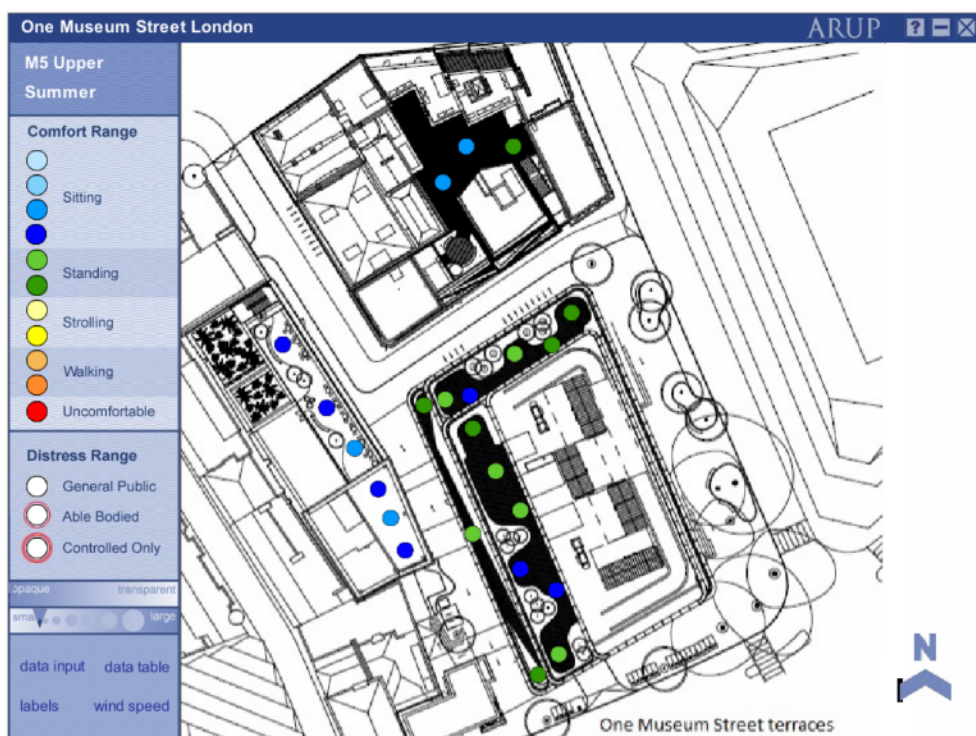


Figure 30: Proposed Development with Cumulative Surroundings Summer results (Terraces and Courtyard)

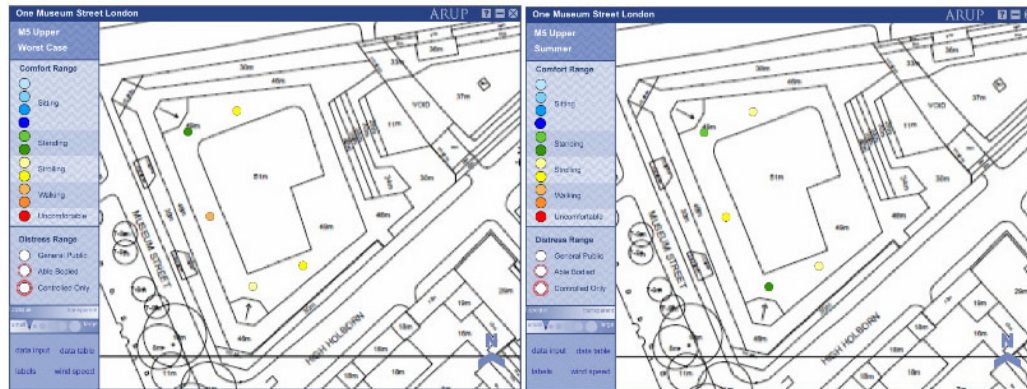


Figure 31: 'Worst' and summer season conditions on the roof terrace of the Post Building in presence of the Proposed Development in existing surroundings

4 Conclusions

This report provides an assessment of the effects on the wind environment that would arise from the Proposed Development. The assessment is based on wind tunnel testing which was conducted at RWDI in Milton Keynes.

Three configurations were considered for testing:

- The Existing Site with Existing Surroundings (Baseline);
- The Proposed Development with Existing Surroundings and mitigations measures; and
- The Proposed Development with Cumulative Surroundings and mitigations measures.

Wind conditions for the above scenarios are briefly discussed below.

Baseline

Baseline wind conditions are typically ‘Sitting’ or ‘Standing’ as typical of sheltered urban areas which is suitable for intended uses.

Proposed Development in existing surroundings

With Proposed Development in existing surroundings, the ground level windiness around the site remains generally similar to existing. Increased levels of windiness (‘Strolling’) are measured along West Central Street; local mitigation in the form of a recess has been recommended for primary entrances facing this street.

With tested mitigation measures consisting of trees and a solid balustrade, wind conditions on the upper level terraces of One Museum Street are found to be generally suitable for short term seating and entrances. Wind conditions on the Vine Lane terrace and within the courtyard of West Central Street at level 1 are also found to be suitable for outdoor seating.

Windiness on the roof terrace of the Post Building immediately to the east of the Site is similar to existing with exception of the western roof section where the local windiness increased by one category. The wind tunnel model included a perimeter balustrade of 1.4m along the terrace perimeter.

Proposed Development in cumulative surroundings

Cumulative changes to surroundings are relatively distant from the Site and measured wind conditions remain similar to those with existing surroundings.

Appendix B

Environmental Wind Planning Report

Memorandum

To	Isabel Moreira, Sanket Ghatalia
Date	17 March 2022
Copies	Melanie Atkinson, Steven McCloy
Reference number	271284-04
From	Giulia Matteoni
File reference	File Reference
Subject	Museum Street and West Central Street, London. Desk study assessment of the impact of design changes on wind environment following the planning submission

1. Introduction

An assessment of the effects on wind environment that would arise from the Proposed Development at Selkirk House, 1 Museum Street, 10-12 Museum Street, 35-41 New Oxford Street and 16A-18 West Central Street, London, WC1A 1JR was undertaken by Arup.

The assessment was based on a wind tunnel workshop that was carried out at RWDI Anemos in Milton Keynes on 20 November 2020. The Lawson LDDC criteria¹ for comfort and safety were used to assess acceptability of windiness for intended pedestrian activities.

The wind tunnel study concluded that with the Proposed Development and proposed details of landscaping, ground level windiness around the Site remains generally similar to existing and is suitable for intended pedestrian activities. Increased levels of windiness as compared to existing are measured along West Central Street; local mitigation in the form of a recess has been recommended for primary entrances facing this street.

With tested mitigation measures consisting of trees and a solid balustrade, wind conditions on the upper-level terraces of One Museum Street are found to be generally suitable for short term seating and entrances. Wind conditions on the Vine Lane terrace and within the courtyard of West Central Street at level 1 are also found to be suitable for outdoor seating.

Windiness on the roof terrace of the Post Building immediately to the east of the Site is similar to existing with exception of the western roof section where the local windiness increased by one category. The wind tunnel model included a perimeter balustrade of 1.4m along the terrace perimeter.

A detailed description of this study was summarised in the environmental wind planning report prepared by Arup, dated 24 February 2021.

Following the planning submission, some design changes have been proposed by DSDHA for the One Museum Street and Vine Lane buildings.

¹ Lawson, T.V., The evaluation of the windiness of a building complex before construction, London Docklands Development Corporation, 1990

A desk study assessment has been carried out by Arup to evaluate the impact of these changes on usability of outdoor spaces for pedestrian activities. The study was based on a review of architectural drawings provided by the DSDHA Architects in February 2022, and our previous experience of wind tunnel testing for the scheme.

2. Proposed design changes following the planning submission

One Museum Street

The overall height of the One Museum Street block has been reduced by 2 stories (c. 6245mm). The following additional changes are proposed.

Ground Floor

- (1) The width of colonnade on Museum Street is increased by circa 500mm and the revolving doors (previously projecting into the colonnade) are now recessed
- (2) The outward opening double door entrance to retail space on High Holborn is now set back by 1200mm
- (3) Following a review of the highways the need for a 3m clear footway on Museum Street is currently being reviewed, which might have some impact on the design of the public realm locally

Upper Floors

- (4) The massing has been revised along the east/west façade to the upper floors (**reduced** by circa 1500mm to the east from level 5 and above, and by circa 1500mm to the west from level and above)
- (5) The south terraces on all floors of the south facade (except on level 18) are now omitted

Vine Lane Building

The overall height of the building remains unchanged. The following changes have been proposed

- (1) Change of use to residential, with commercial / retail use at ground floor
- (2) Inclusion of a ground floor residential entrance on Vine Lane and retail units entrances along Vine Lane and West Central Street
- (3) Inclusion of inset recessed private balconies on the typical residential floors
- (4) Inclusion of a communal terrace as outdoor amenity space with integrated informal play space

Landscaping proposals with the Site boundary and intended use of outdoor spaces remain unchanged.

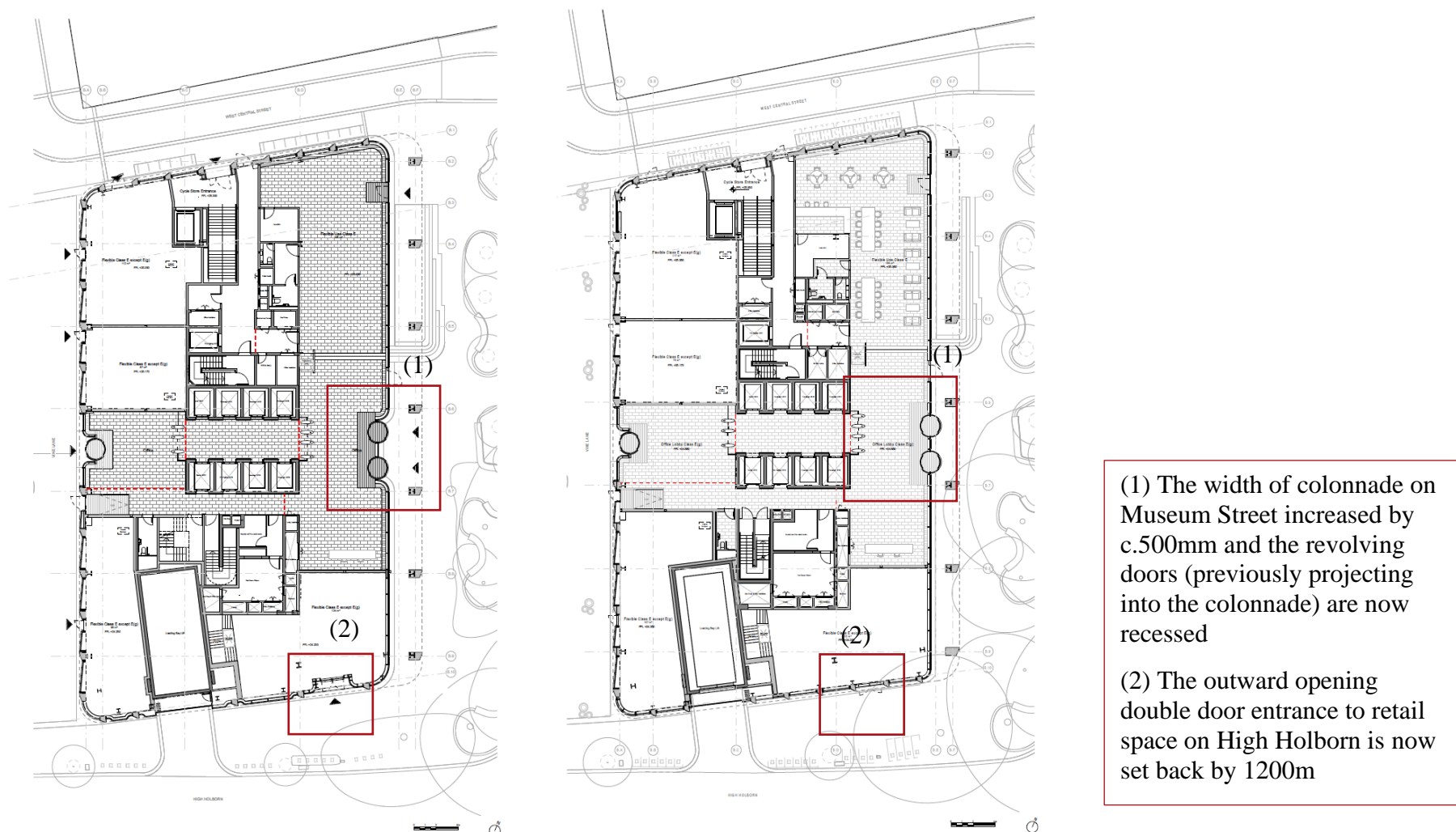


Figure 1: Current (February 2022) ground floor plan of One Museum Street (left); previous (February 2021) ground floor plan of One Museum Street

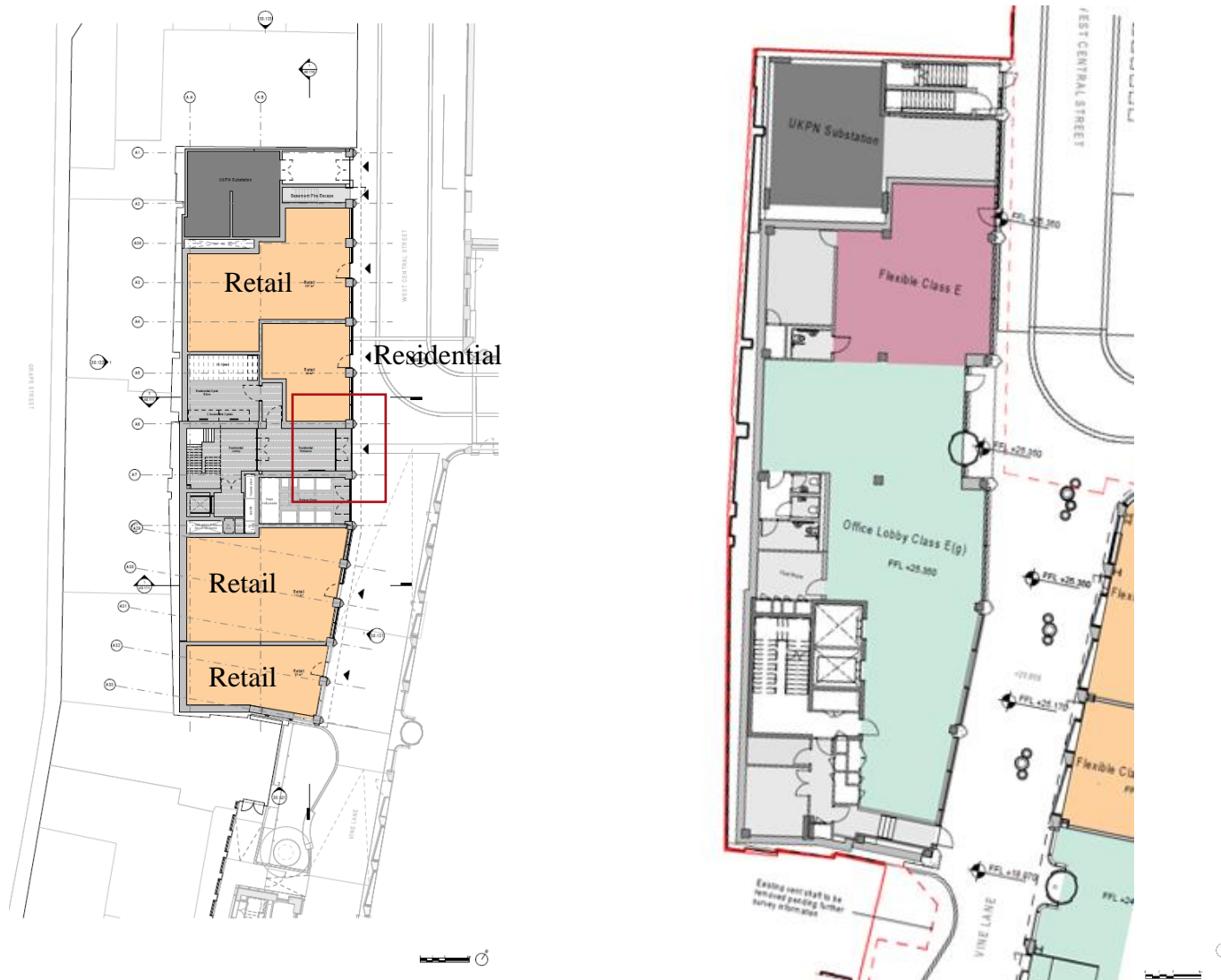


Figure 2: Current (e.g. February 2022) ground floor plan of Vine Lane building (left); previous (e.g. February 2021) ground floor plan of One Museum Street

3. Implications of design changes to windiness levels

Ground and upper-level wind conditions as measured in the wind tunnel and as described in the environmental wind planning report are reported in Figures 3-6.

With the reduction in height of One Museum Street by two storeys, windiness levels at ground and on the upper levels are likely to remain similar to previously reported or marginally better.

Changes to the configuration of the colonnade (increased in width by c.500mm), to the entrance on Museum Street (now recessed) and to the retail entrance on High Holborn (now set back by 1200m) are also likely to have a beneficial impact on the local wind conditions, as the entrances benefit from an additional degree of sheltering.

Impacts of potential changes to the public realm on Museum Street shall be reviewed again once confirmed. With the proposed landscaping, the local windiness ranges between 'Sitting' to 'Standing', which is acceptable for entrance and pedestrian access use. It may be assumed that with a reduction in the local landscaping conditions will remain acceptable for access uses. The main building entrance is recessed and sheltered by the colonnade; changes to the landscaping on Museum Street are not likely to have a significant impact on usability for primary entrance use.

Similarly, the proposed changes to the Vine Lane building are not likely to impact the local windiness which remains acceptable for intended activities. 'Standing' conditions are measured on Vine Lane and West Central Street as acceptable for entrance uses. 'Sitting' conditions are measured on the roof level of the Vine Lane building which remains acceptable for the proposed use as outdoor amenity space.

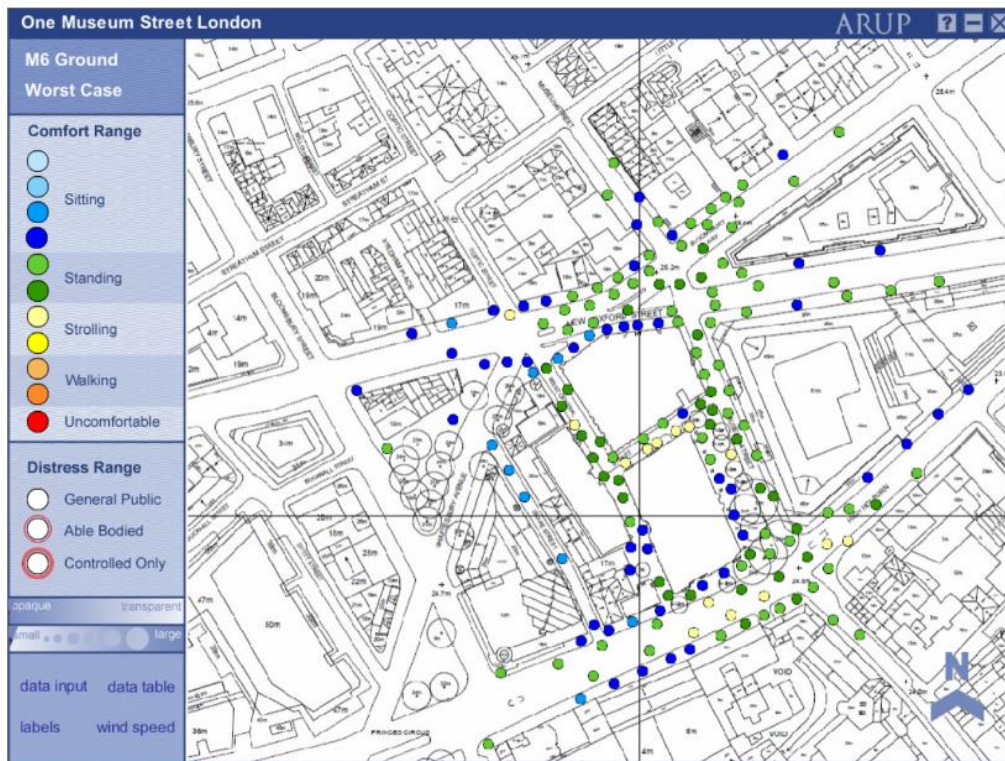


Figure 3: Ground level wind conditions for the Proposed Development with Existing Surroundings (worst season results)

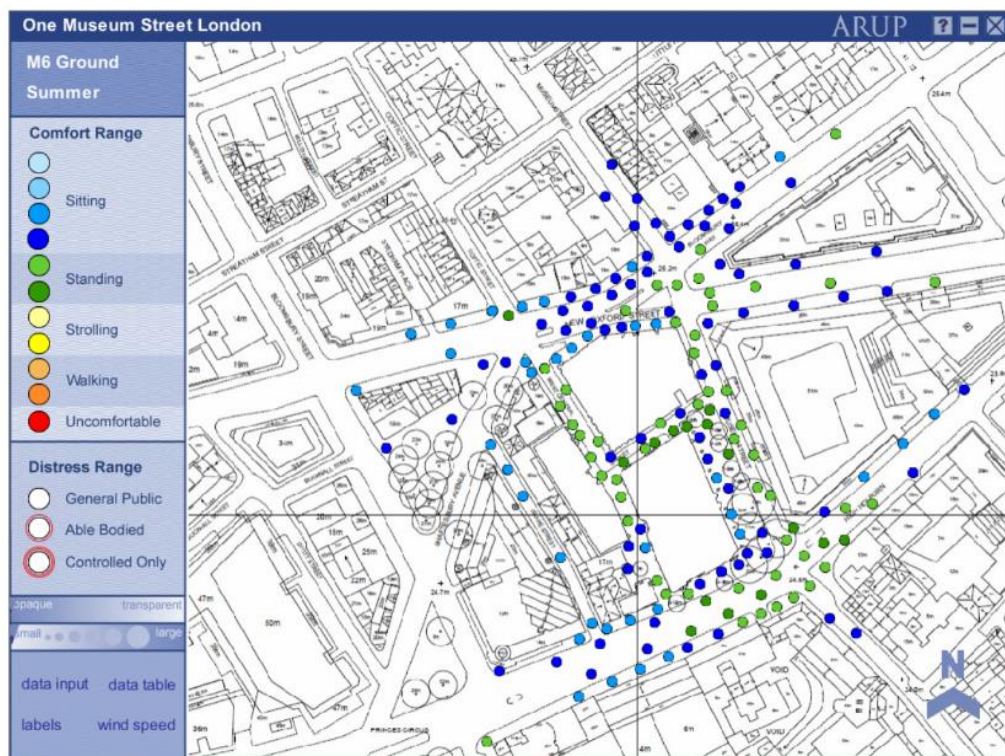


Figure 4: Ground level wind conditions for the Proposed Development with Existing Surroundings (summer season results)

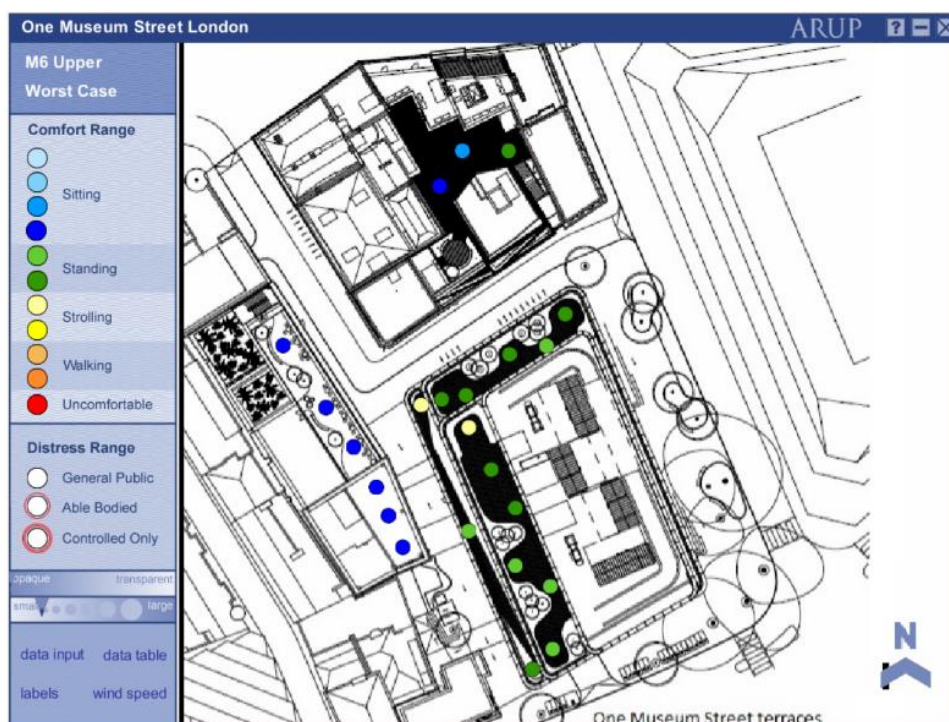


Figure 5: Upper-level wind conditions for the Proposed Development with Existing Surroundings (worst season results)



Figure 6: Upper-level wind conditions for the Proposed Development with Existing Surroundings (worst season results)

4. Conclusions

Following the planning submission, some design changes have been proposed by DSDHA to the One Museum Street and the Vine Lane buildings.

A desk study assessment has been carried out by Arup to evaluate the impact of these changes on usability of outdoor spaces for pedestrian activities. The study was based on a review of architectural drawings provided by the DSDHA Architects in February 2022, and our previous experience of wind tunnel testing for the scheme.

The desk study has concluded that with the proposed changes to the design, wind conditions around the Proposed Development at ground and the upper levels are likely to remain similar to previously reported or marginally better.