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Alpha Square
Pedestrian Level Wind Microclimate Assessment – Further Information Addendum

RWDI # 1502677-PLW- Cumulative Assessment
March 8th, 2016

Cumulative Assessment Report

Introduction

The original wind tunnel testing was conducted in 2014 for the Proposed Alpha Square Development which included three configurations:

- Configuration 1: Existing Site with existing surrounding buildings;
- Configuration 2: Proposed Development with existing surrounding buildings; and
- Configuration 3: Proposed Development with cumulative surrounding buildings.

At the time those tests were conducted, the list of cumulative schemes did not include the proposed Cuba Street development, located to the northwest of the proposed Alpha Square site. Under instruction from the Developer, Far East Consortium International Ltd, a further series of wind tunnel test has been conducted with the Proposed Development with cumulative surrounding buildings including the future Cuba Street development. Furthermore the proposed landscaping scheme (included in the planning application) was used as a starting point for the mitigation workshop. During the workshop, the specific details of the proposed landscaping scheme within the Site and additional mitigation along Bellamy Close and Cuba Street were investigated and are described in detail within this further information addendum report.

Figures 1 and 2 show the wind microclimate results for the Proposed Development with cumulative surroundings (including Cuba Street) without the landscaping scheme or additional mitigation measures.

Results

This Configuration incorporated the following cumulative schemes and further schemes to be considered were included in the terrain roughness analysis:

- New Foundland PA/13/01455;
- Riverside South PA/08/02249;
- Hertsmere House PA/15/02675;
- Heron Quays West PA/14/01664;
- The City Pride PA/12/03248;
- 30 Marsh Wall PA/09/00410;
- 225 Marsh Wall PA/15/2303;
- Arrowhead Quay PA/12/03315;

- Cuba Street PA/15/02528;
- 2 Millharbour (Press Centre);
- South Quay Square PA/14/03195;
- Westferry Printworks PA/15/02216; and
- Millharbour PA/04/01847.

Figure 3 shows the ground level wind microclimate during the windiest season and Figures 4-6 show the wind microclimate at ground, balcony and terrace levels during the summer season. Consistent with the methodology used in the original wind microclimate assessment, the conditions are classified according to the Lawson Comfort Criteria (the 'LCC'). The LCC are used to 'rate' the wind conditions according to the type of pedestrian usage for which those conditions would be tolerable, reflecting the fact that pedestrians will be more tolerant of winds if they are passing quickly through an area, compared to an area where they may want to sit for extended periods of time. The target wind environment can be summarized as follows:

- 'Leisure walking' conditions (or calmer) during the windiest season for pedestrian thoroughfares;
- 'Standing/entrance use' (or calmer) during the windiest season for entrances, bus stops, taxi ranks and waiting areas; and
- 'Sitting' conditions during the summer for amenity/outdoor seating areas.

The LCC also specifies thresholds for infrequent strong winds that would potentially affect safety, and these are also assessed alongside the comfort conditions described above.

Please note that the results presented below include the effects of the proposed landscaping scheme within the Site and mitigation measures along Bellamy Close and Cuba Street. Details of the landscaping scheme are provided later in this further information addendum report.

Ground Level

With the cumulative schemes in situ, the majority of locations at ground level are acceptable for their intended use except the stairs to the north of the Site. This is due to the sheltering effect created by the large cumulative schemes to the west, north and east of the Proposed Development. Due to their large massing and their close proximity to each other, they create blockage which caused the oncoming flow to travel around this area of London, rather than through it. Wind conditions range from acceptable for sitting to leisure walking use (with one locations observing business walking conditions). The effects with respect to specific uses of the site are as follows:

- **Thoroughfares**

The majority of locations on site remain similar to the configuration with existing surrounding buildings (i.e. Configuration 2 in the previous wind microclimate assessment) with some additional locations observing sitting wind conditions during the windiest season. Several receptors along Manilla Street and to the west of the Manilla Street Site observe one category calmer wind conditions compared to Configuration 2; however the majority of thoroughfare locations remain acceptable for their intended use. The stairs to the north of the Site remain observing windier than desired conditions (receptors 13, 14, 33 and 34).

- **Entrances**

During the windiest season (see Figure 3), entrances located at receptors 55 (north façade Manilla Street Site), 15, 35 and 73 (north, west and south façade respectively of the Marsh Wall Site) were all classified as acceptable for entrance or sitting use. These results would be acceptable for an entrance.

- **Amenity Space**

During the summer season (as shown in Figure 4), all locations observe sitting or standing wind conditions. The central amenity space around Manilla Street observes sitting wind conditions and therefore is acceptable for its intended use.

East of the Marsh Wall Site there is amenity space, receptors 75 and 76, which experienced a wind microclimate acceptable for sitting.

Podium Level

Receptors 59, 60 and 87, amenity spaces located on the podium (Figure 5) of the Marsh Wall Site experienced the required sitting classification and are therefore acceptable for their intended amenity use.

All podium receptors (163-165 and 182) on the Manilla Street Site (Figure 6) observe the desired sitting wind condition during the summer season, and are also therefore acceptable for amenity use.

Terrace Levels

Terrace locations 88-96, 102-106 and 108 on the Marsh Wall Street (Figure 5) experienced the required sitting wind conditions. Receptors 99, 101 and 107 remained observing standing wind conditions, one category windier than desired, these terraces should be used weather permitting.

Terrace locations on the Manilla Street Site (Figure 6), receptors 166-177 and 179-181 experienced sitting wind conditions. Receptor 178 observed one category winder than desired conditions and therefore should be used as weather permits.

Furthermore, we expect further improvements in this area can be achieved with adding landscaping and edge detail to these terraces which will be developed through further wind tunnel testing.

Strong Winds

The addition of the cumulative surrounding buildings provided evident shelter as there are very few exceedances of the strong wind threshold. There were a total of four occurrences of strong winds in excess of Beaufort Force 6 for more than one hour throughout the year.

Receptors 10 and 123 observed strong winds in exceedance of Beaufort Force 6 for up to 4.1hours per annum. Infrequent winds of this magnitude are unlikely to cause a nuisance to pedestrians on a thoroughfare.

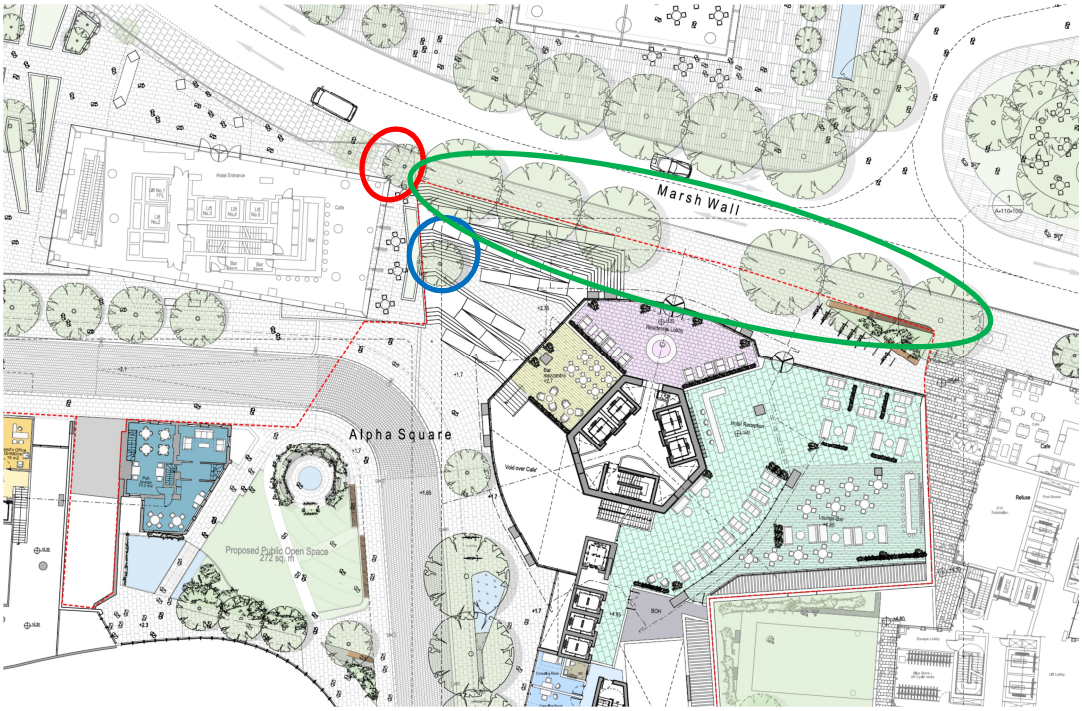
Receptors 13, 14 and 33 observe strong winds exceeding Beaufort Force 6 for up to 5.9hours and are located on the stairs to the north of the Site. These occurrences of strong winds require mitigation.

Receptors 107 and 178, both terrace locations, experienced strong wind exceeding Beaufort Force 6 for up to 1.9hours per annum and therefore would require additional mitigation (such as landscaping and edge detail) which will be developed in further wind tunnel tests to eliminate these occurrences or, as suggested, would need to be used weather permitted (i.e. closed off during the winter months).

Detailed Proposed Landscaping Scheme

The details of the proposed landscaping scheme used to successfully mitigate locations on Site consisted of both soft and hard landscaping:

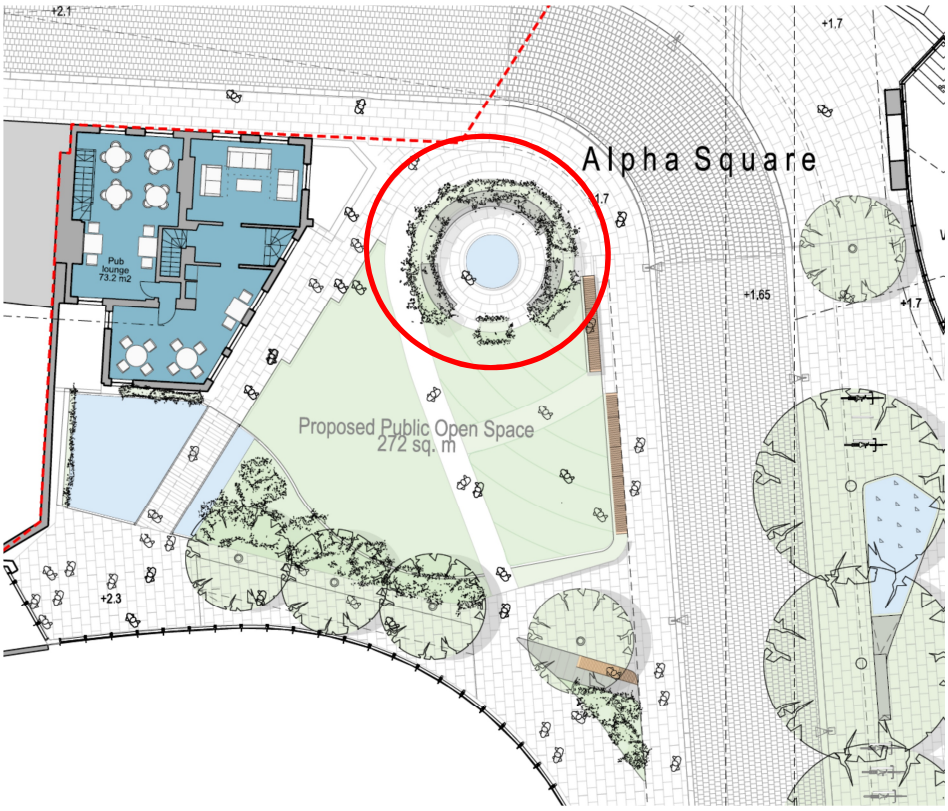
- Six 10m (3m trunk + 7m canopy – highlighted in green) deciduous and one 5m (3m trunk + 2m canopy – highlighted in red) deciduous tree were added along Marsh Wall at the top of the stairs with a 15m (3m trunk with 12m canopy – highlighted in blue) evergreen tree at the eastern façade of 40 Marsh Wall.



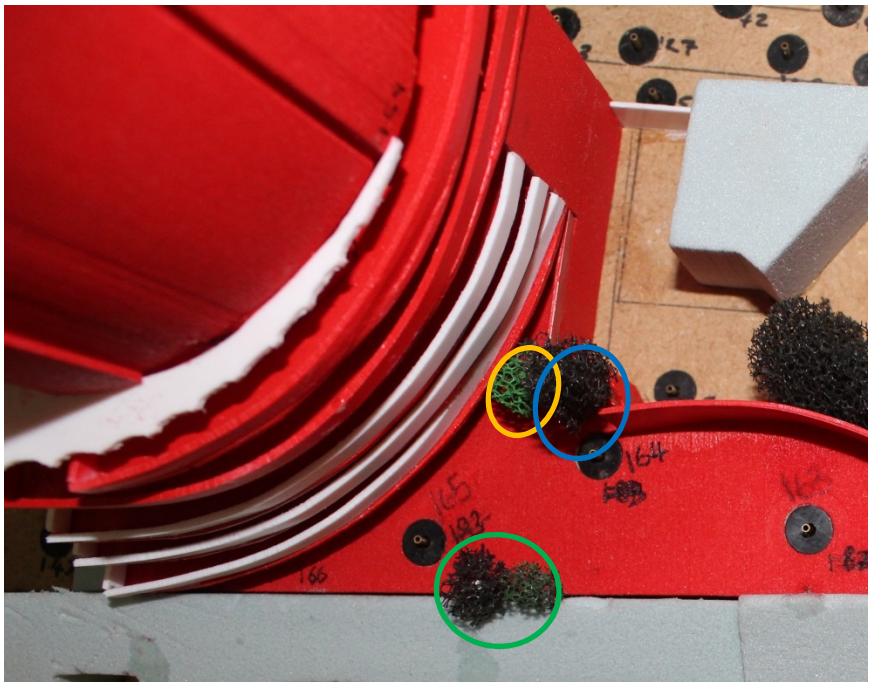
- Four 12m (3m trunk + 9m canopy – highlighted in red) evergreen trees along the northern façade of the Manilla Street Site podium; five 8m (3m trunk + 5m canopy – highlighted in green) evergreen trees along the east edge of Manilla Street; and three 5m (3m trunk + 2m canopy – highlighted in blue) evergreen trees at the southern edge of Manilla Street. These trees also incorporate 1m hedging underneath.

- Isolated windier than desired conditions are located on the stairs to the north of the site during the windiest season in combination with occasional occurrences of strong winds which may impede walking (receptors 13, 14, 33 and 34). Further wind tunnel testing will be carried out to develop further mitigation measures (such as landscaping on the stairs; a canopy extending from the Marsh Wall Site etc.) to provide sufficient shelter to user of the site. The target conditions for this would be standing use during the windiest season and no occurrences of strong winds which we expect will be achievable with appropriate mitigation; however this will need to be tested in the wind tunnel to ensure its effectiveness.

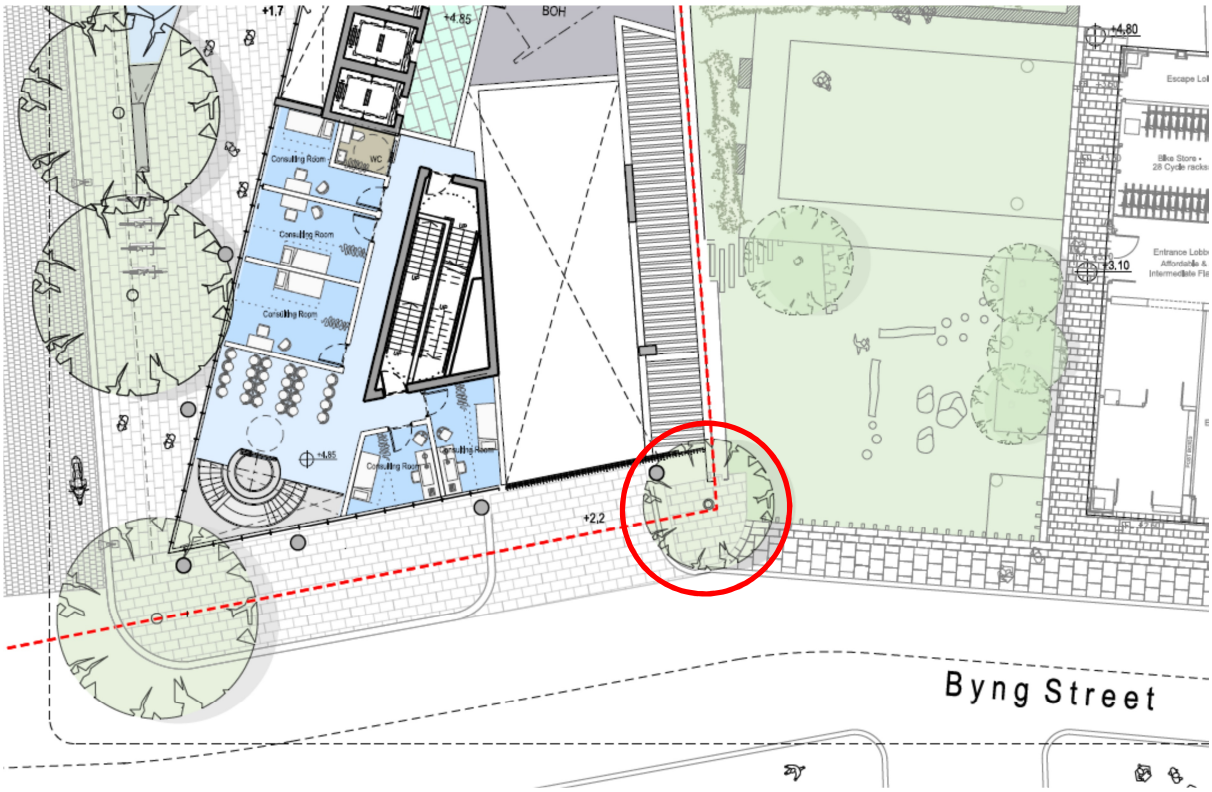
- A semi-circle of nine 5m evergreen trees (3m trunk +2m canopy – highlighted in red) were located centrally between the Marsh Wall and Manilla Street Sites. Additionally there is a 1m solid curved bench.

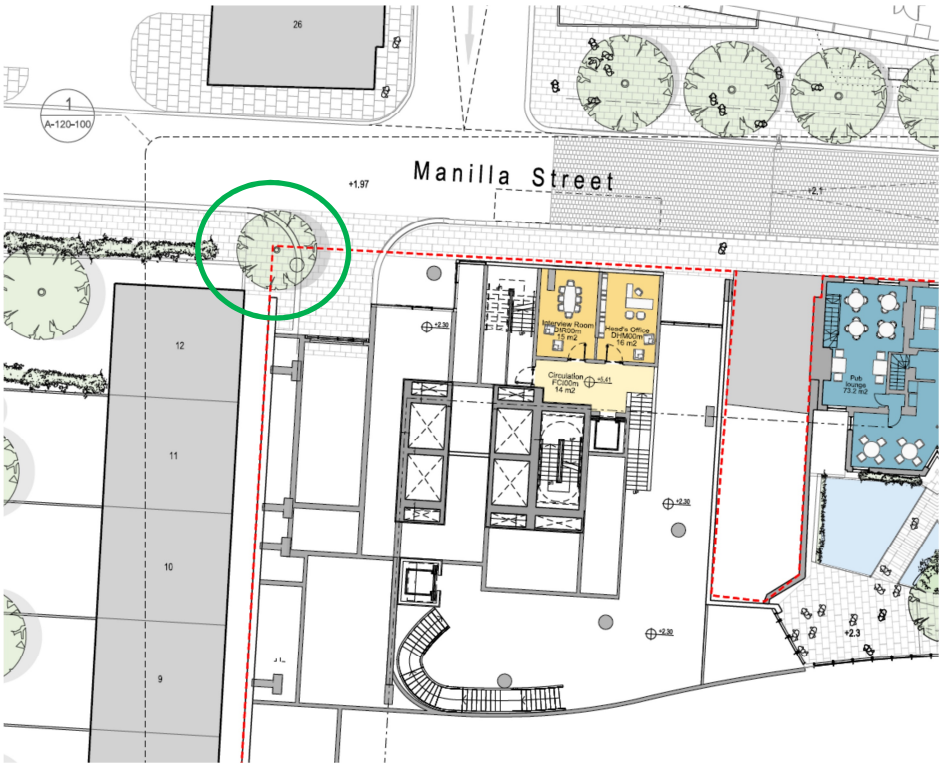


- On the Manilla Street podium, four evergreen trees were added: two 4m trees (2m trunk + 2m canopy – highlighted in green); one 6m tree (2m trunk + 4m canopy – highlighted in yellow; and one 12m tree (3m trunk + 9m canopy – highlighted in blue).

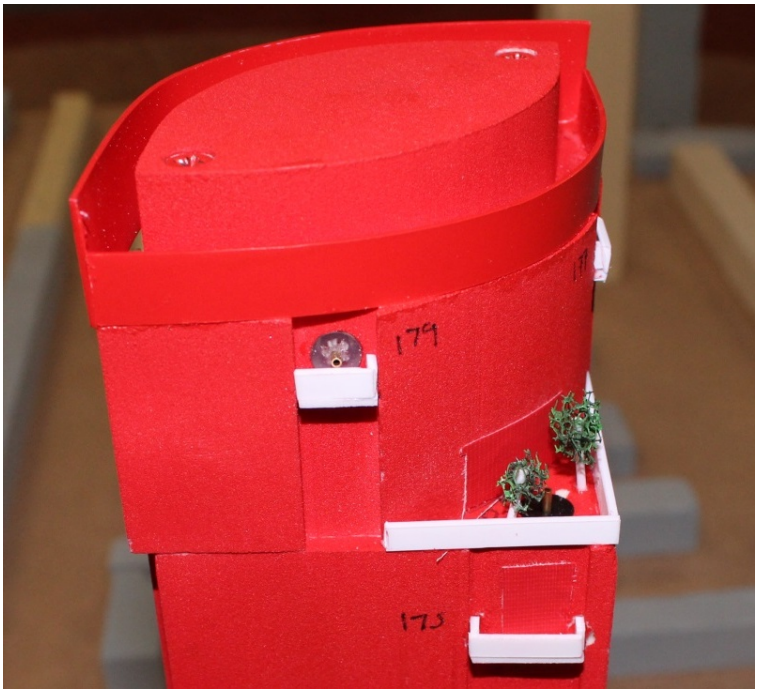


- One 15m evergreen tree (3m trunk + 12m canopy – highlighted in red) on the North-West corner of the Manilla Street Site and one 10m tree (2m trunk + 8m canopy – highlighted in green) at the South-East corner of the Marsh Wall Site.





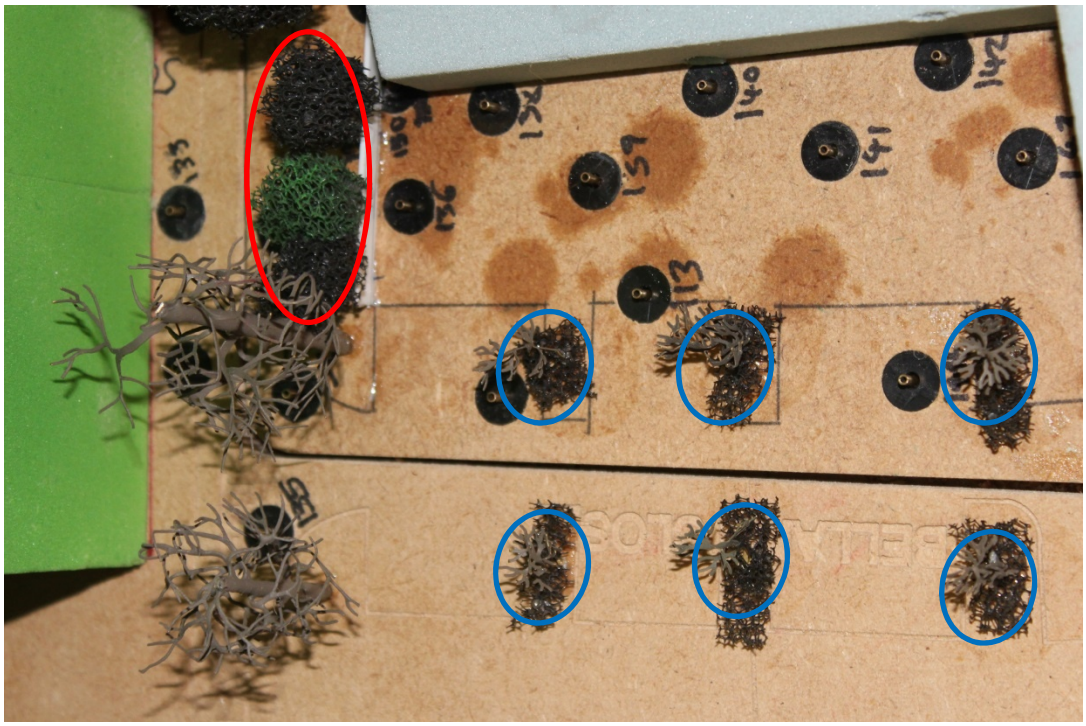
- The roof top terrace of the Manilla Street Site, receptor 178, consisted of a 1.5m solid (glazed) balustrade and 2 4m evergreen trees (2m trunk + 2m canopy). These measures reduced wind speeds; however remained windier than desired and therefore should be used as weather permits. Additional mitigation measures, which will be developed in further wind tunnel tests, such as edge detailing and landscaping are expected to provide further beneficial shelter.



Additional Mitigation Measures

Several off-site windy issues were mitigated using the below mitigation measures. These included several adaptations to the existing landscaping in the area.

- In Bellamy Close, to the west of the Proposed Development, there are two 15m deciduous trees to the North; 1m hedging with six 5m trees (2m trunk + 3m canopy – highlighted in blue). The existing 1.5m brick wall was added into the wind tunnel model (extending from existing housing area – highlighted in red); three 8m evergreen trees (2m trunk + 6m canopy) along the brick wall.



- Along Cuba Street, porous elements attached to street lighting will need to be implemented to reduce wind speeds along this street. During wind tunnel testing these porous elements were 3m above ground, 2m wide and are 4m in height and was found to be effective in reducing winds along Cuba Street. This concept should be explored further using wind tunnel testing in order to create an option which is viable. The porous elements could be in the form of porous sheets or fabric which is under tension raised above the ground (such as on lamp post etc.). An image of such measures and porous elements is shown below:

Conclusion

Overall with the cumulative schemes in place and the landscaping scheme described in this appendix and developed during the mitigation workshop, all ground and podium level locations in and around the Proposed Development are acceptable for their intended use, except at the stairs to the north of the Site. Further wind tunnel testing will be carried out to develop mitigation measures to reduce winds to acceptable conditions and eliminate occurrences of strong winds (receptors 13, 14, 33 and 34). The majority of private terrace spaces within the Proposed Development would also be suitable, with the exception of the roof top terrace of the Manilla Street Site (receptor 178) and the terrace at receptor 107 of the Marsh Wall Site, which have a minor exceedance of comfort and strong wind thresholds. This area would require additional landscaping or should be used weather permitting.

MARSH WALL

MANILLA STREET

BYNG STREET

BYNG STREET

UPPER GROUND FLOOR PLAN

0 10 30m

LEGEND:

LAWSON COMFORT CRITERIA:
- Sitting
- Standing/Entrance
- Leisure Walking
- Business Walking
- Carpark/Roadway

SENSOR LOCATION:
- Grade Level
- Podium Level
- Terrace/Balcony Level

Pedestrian Wind Comfort Conditions: C3 - Proposed Development with Cumulative Surrounds Windiest Season

Alpha Square - London, United Kingdom

True North

Drawn by:	SM	Figure:	1
Approx. Scale:			1:600
Date Revised:			Feb. 29, 2016

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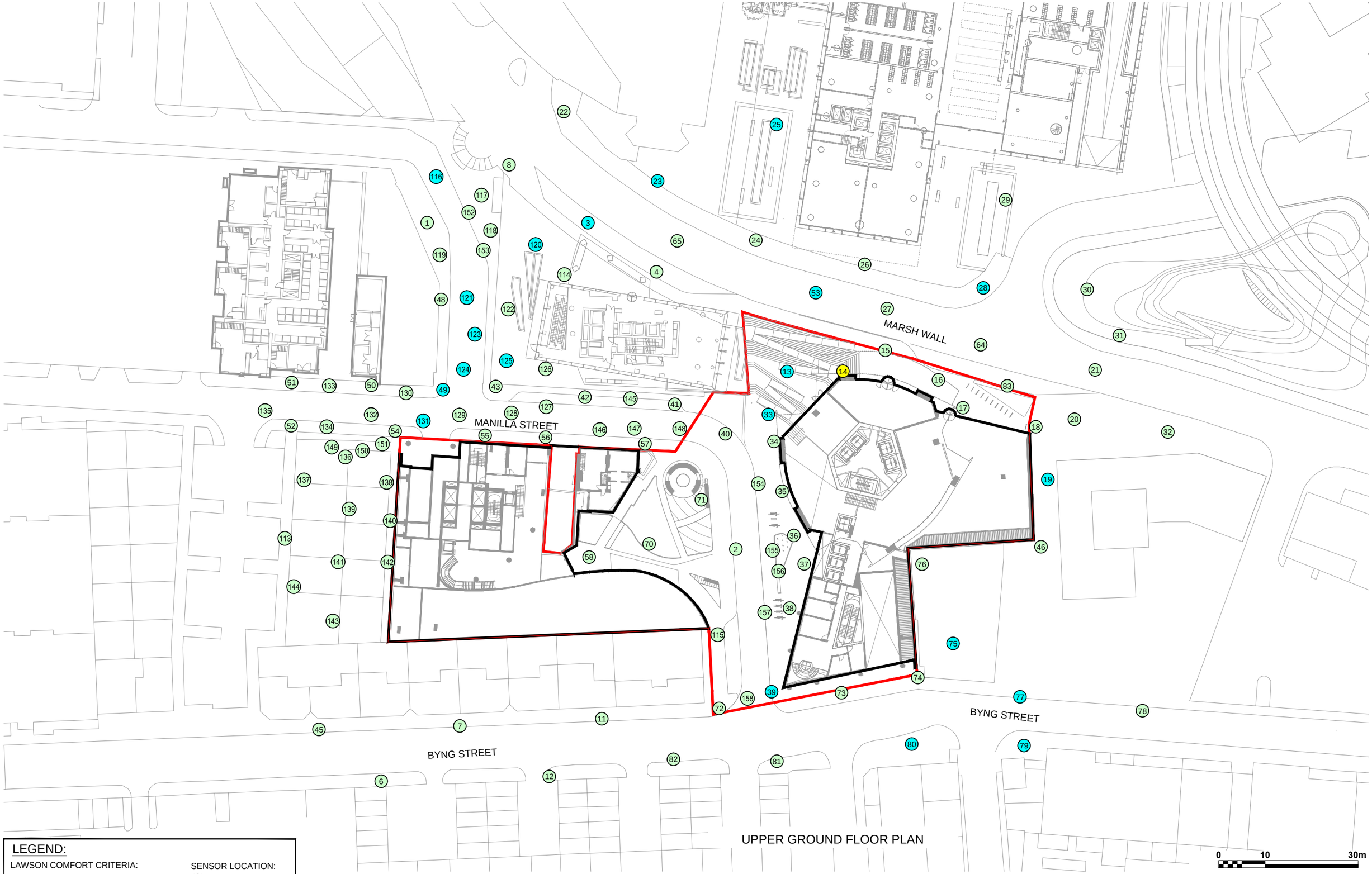

LEGEND:

LAWSON COMFORT CRITERIA:
- Sitting
- Standing/Entrance
- Leisure Walking
- Business Walking
- Carpark/Roadway

SENSOR LOCATION:
- Grade Level
- Podium Level
- Terrace/Balcony Level

Pedestrian Wind Comfort Conditions: C3 - Proposed Development with Cumulative Surrounds Summer Season

Alpha Square - London, United Kingdom

True North

Drawn by:	SM	Figure:	2
Approx. Scale:	1:600		
Date Revised:	Feb. 29, 2016		

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MARSH WALL

MANILLA STREET

BYNG STREET

BYNG STREET

UPPER GROUND FLOOR PLAN

0 10 30m

LEGEND:

LAWSON COMFORT CRITERIA:

- Sitting
- Standing/Entrance
- Leisure Walking
- Business Walking
- Carpark/Roadway

SENSOR LOCATION:

- Grade Level
- Podium Level
- Terrace/Balcony Level

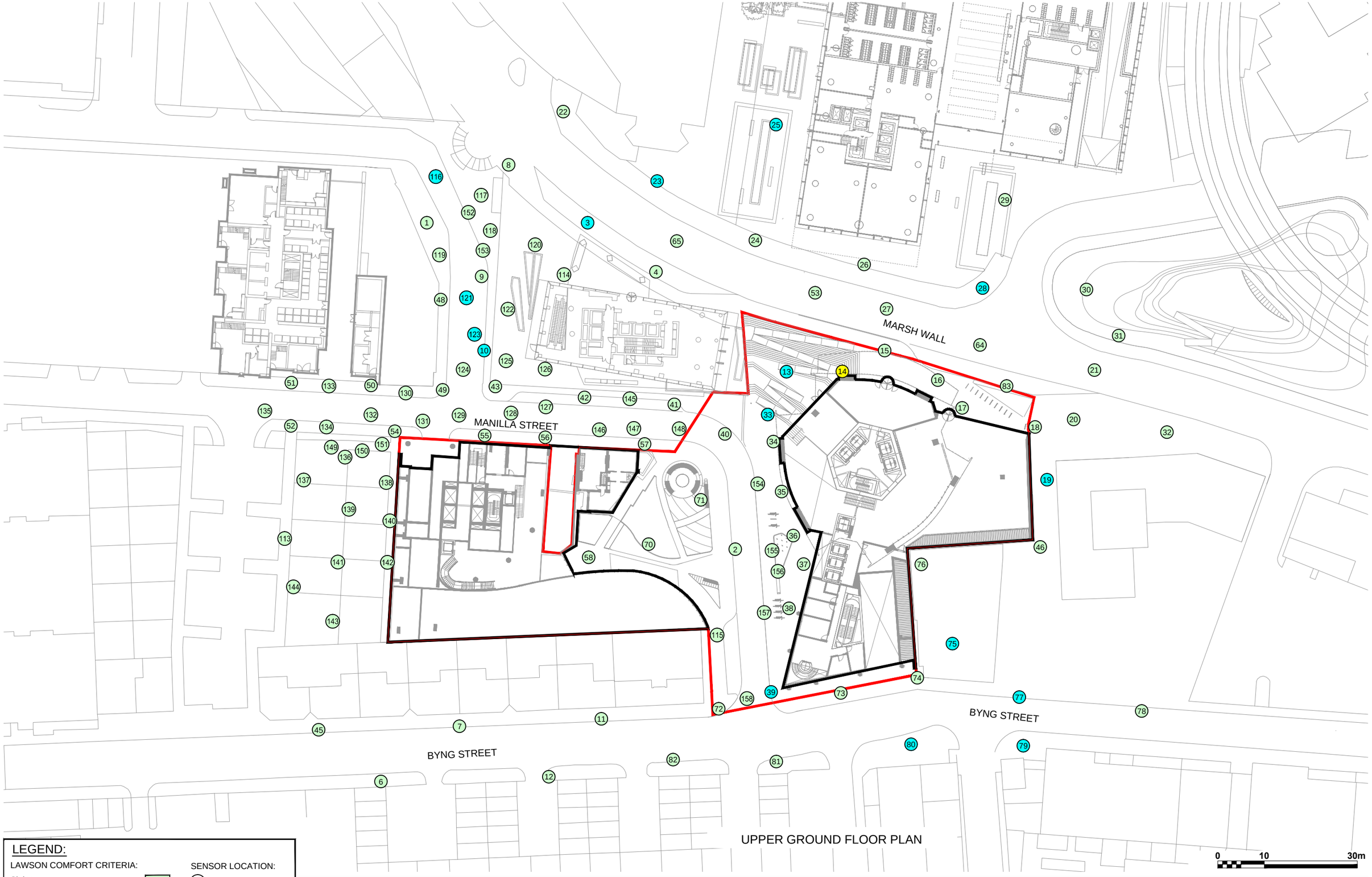
Pedestrian Wind Comfort Conditions: Configuration 4
Windiest Season

Alpha Square - London, United Kingdom

True North

Drawn by:	VMX	Figure:	3
Approx. Scale:			1:600
Date Revised:			Mar. 07, 2016

RWDI



LEGEND:

LAWSON COMFORT CRITERIA:

- Sitting
- Standing/Entrance
- Leisure Walking
- Business Walking
- Carpark/Roadway

SENSOR LOCATION:

- Grade Level
- Podium Level
- Terrace/Balcony Level

UPPER GROUND FLOOR PLAN

0 10 30m

Pedestrian Wind Comfort Conditions: Configuration 4
Summer Season

Alpha Square - London, United Kingdom

True North

Drawn by:	VMX	Figure:	4
Approx. Scale:			1:600
Date Revised:			Mar. 07, 2016

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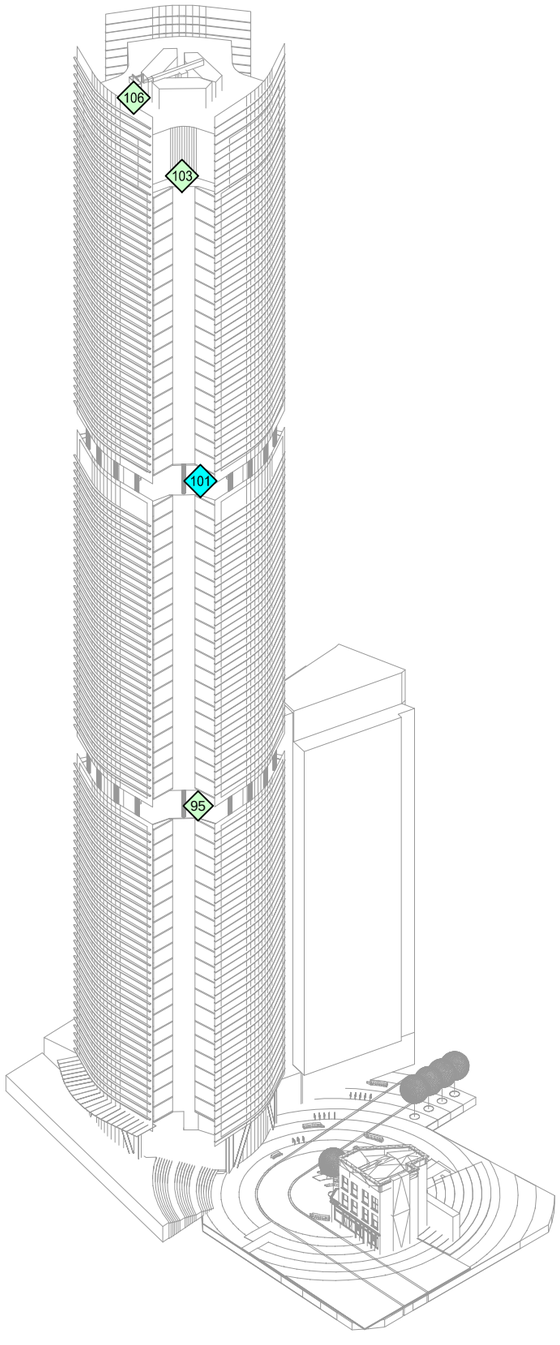

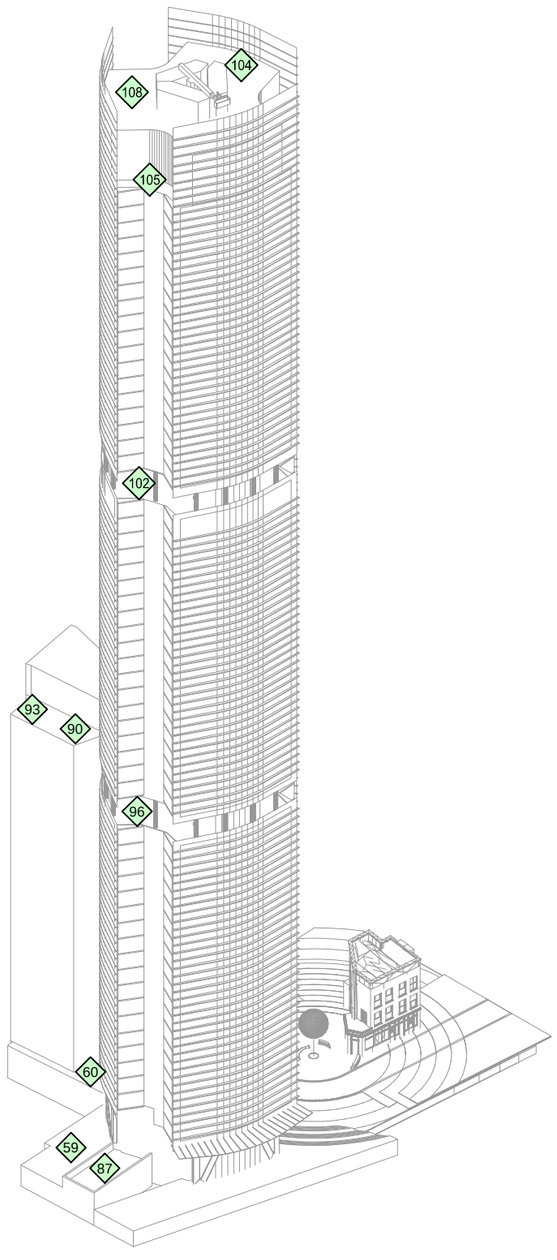

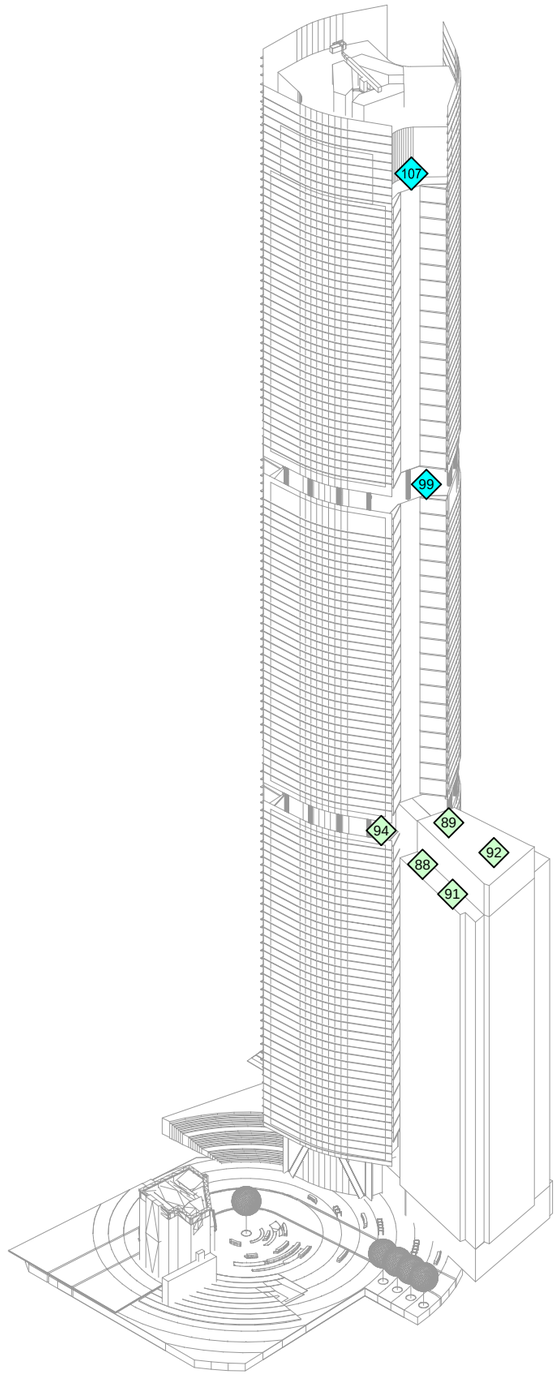

LEGEND:

LAWSON COMFORT CRITERIA:

- Sitting
- Standing/Entrance
- Leisure Walking
- Business Walking
- Carpark/Roadway

SENSOR LOCATION:

- Grade Level
- Podium Level
- Terrace/Balcony Level

East Building Balcony Layout

Pedestrian Wind Comfort Conditions: Configuration 4

Summer Season

Alpha Square - London, United Kingdom

Project #1502677

0 10 30m

Drawn by: VMX	Figure: 5
Approx. Scale:	1:1250
Date Revised:	Mar. 07, 2016

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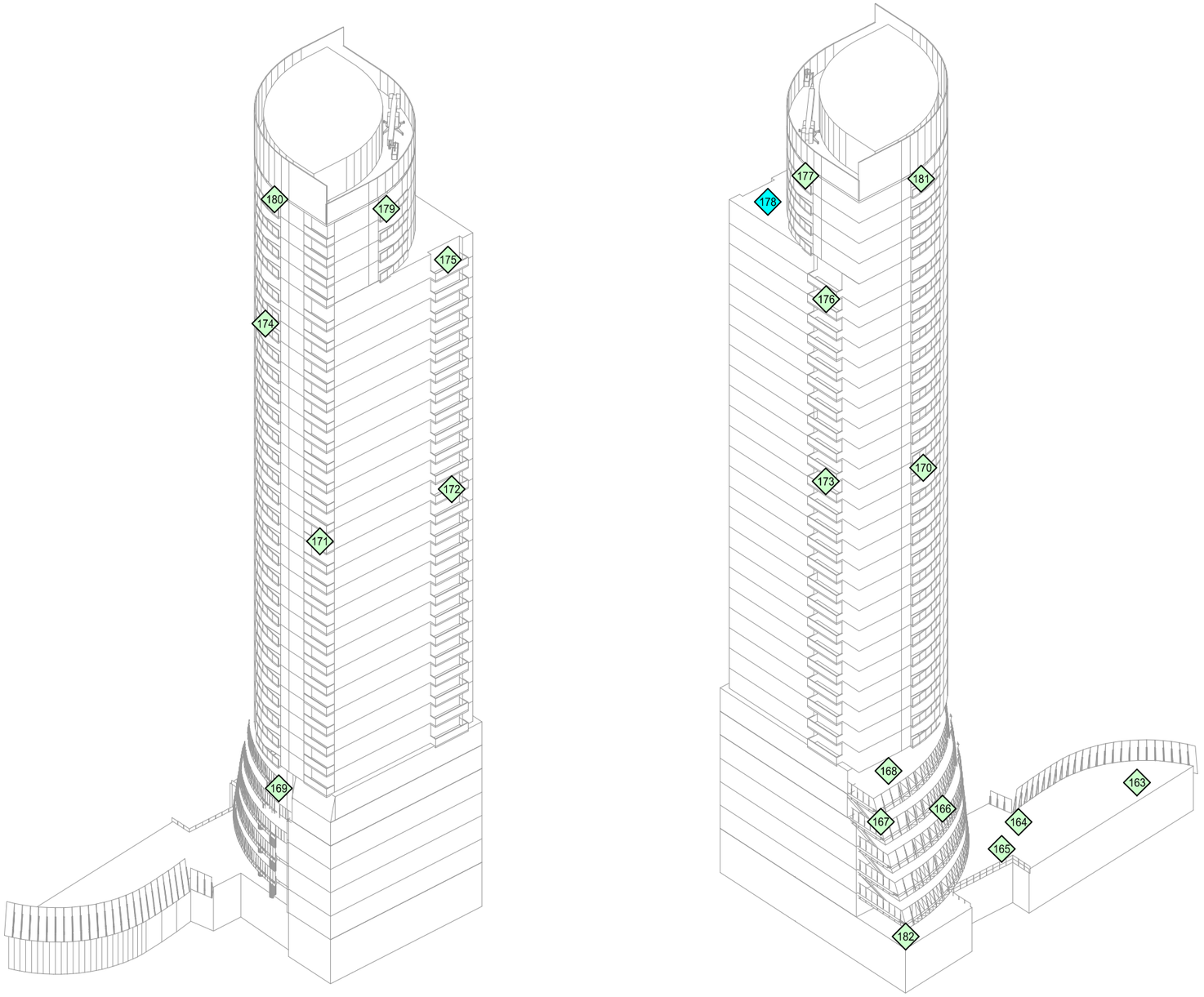

LEGEND:

LAWSON COMFORT CRITERIA:

- Sitting
- Standing/Entrance
- Leisure Walking
- Business Walking
- Carpark/Roadway

SENSOR LOCATION:

- Grade Level
- Podium Level
- Terrace/Balcony Level

West Building Balcony Layout

Pedestrian Wind Comfort Conditions: Configuration 4

Summer Season

Alpha Square - London, United Kingdom

0 10 30m

Project #1502677

Drawn by:	VMX	Figure:	6
Approx. Scale:			1:750
Date Revised:			Mar. 07, 2016

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