



# FINAL REPORT

## STATION HILL PHASE 3

READING, UK

PEDESTRIAN LEVEL WIND MICROCLIMATE TECHNICAL APPENDIX

RWDI #2512172

MARCH 10<sup>TH</sup>, 2026

SUBMITTED TO

SH Reading Master LLP

SUBMITTED BY

RWDI



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## VERSION HISTORY

| RWDI Project #2512172 |                  | Station Hill Phase 3, Reading, UK |  |
|-----------------------|------------------|-----------------------------------|--|
| Report                | Releases         | Dated                             |  |
| Reports               | Rev A            | March 10 <sup>th</sup> , 2026     |  |
| Project Team          | ZRK<br>KJ<br>SGI |                                   |  |

# 1 INTRODUCTION

This supporting technical appendix accompanies the wind microclimate ES Addendum submitted to for full planning permission for the development of Station Hill Phase 3 (hereafter referred to as the “Proposed Development”).

This ES has been prepared by RWDI and details the wind microclimate for the Proposed Development.

Wind tunnel tests were conducted on a 1:300 scale model of the Proposed Development. The investigation quantifies the wind conditions within and around the Site through comparing the measured wind velocity and frequency of occurrence with the with the Lawson Comfort Criteria. Meteorological data for Reading, adjusted to account for the effects of terrain roughness surrounding the Site have been utilised in this assessment.

Measurements were taken at up to 240 locations for 36 wind directions, in 10° increments. The measurements covered ground level locations along the building façades and at corners, near main entrances, on pedestrian routes within and around the Site, terraces and balconies within the Site. Analysis was conducted on seasonal basis, however, the report focuses primarily on the windiest season (i.e. winter) and the summer season results, when pedestrian activity generally requires calmer conditions.

The following list details the five configurations tested in the wind tunnel:

- Configuration 1: Existing Site with Existing Surrounding Buildings and Existing Landscaping;
- Configuration 2: Proposed Development (Phase 3) with Plot C (Illustrative Scheme), Existing Surrounding Buildings and Existing Landscaping;
- Configuration 3: Proposed Development (Phase 3) with Plot C (Maximum Parameters Scheme) Existing Surrounding Buildings;
- Configuration 4: Proposed Development (Phase 3) with Plot C (Illustrative Scheme), Existing Surrounding Buildings, Proposed and Existing Landscaping and Mitigation; and
- Configuration 5: Proposed Development (Phase 3) with Plot C (Illustrative Scheme), Cumulative Surrounding Buildings, Proposed and Existing Landscaping and Mitigation.



## 2 METHODOLOGY AND ASSESSMENT CRITERIA

Wind tunnel testing is a well-established and robust technique to assess the pedestrian wind microclimate of the Proposed Development. It provides the means to quantify the wind conditions at the Site and for the measurements to be classified in accordance with the Lawson Comfort Criteria (outlined in Section 2.5). Wind tunnel investigations were conducted using a 1:300 scale model of the Proposed Development with existing and cumulative surrounding buildings and terrain covering a radius of 360m centred on the Site.

The basic methodology for quantifying the pedestrian level environment is outlined below:

1. Measure the wind speeds at pedestrian level in the wind tunnel relative to a reference wind speed;
2. Adjust standard meteorological data to account for conditions at the Site;
3. Combine these to obtain the expected frequency and magnitude of wind velocities at pedestrian level; and
4. Compare the results with the Lawson Comfort Criteria to 'grade' conditions around the Site.

### 2.1 Simulation of Atmospheric Winds

The wind is turbulent, or gusty, and this turbulence varies depending upon the Site. It is necessary to reflect these differences in the wind tunnel test. In addition, the atmospheric boundary layer is a shear flow which means that the mean wind speed increases with height.

Modelling these effects is achieved by a combination of spires and floor roughness elements to create a naturally grown boundary layer that is representative of urban or open country conditions, as appropriate. The detailed contoured proximity model around the Site is used to fine-tune the flow and create conditions similar to those expected at full scale (as shown in Figure 1).

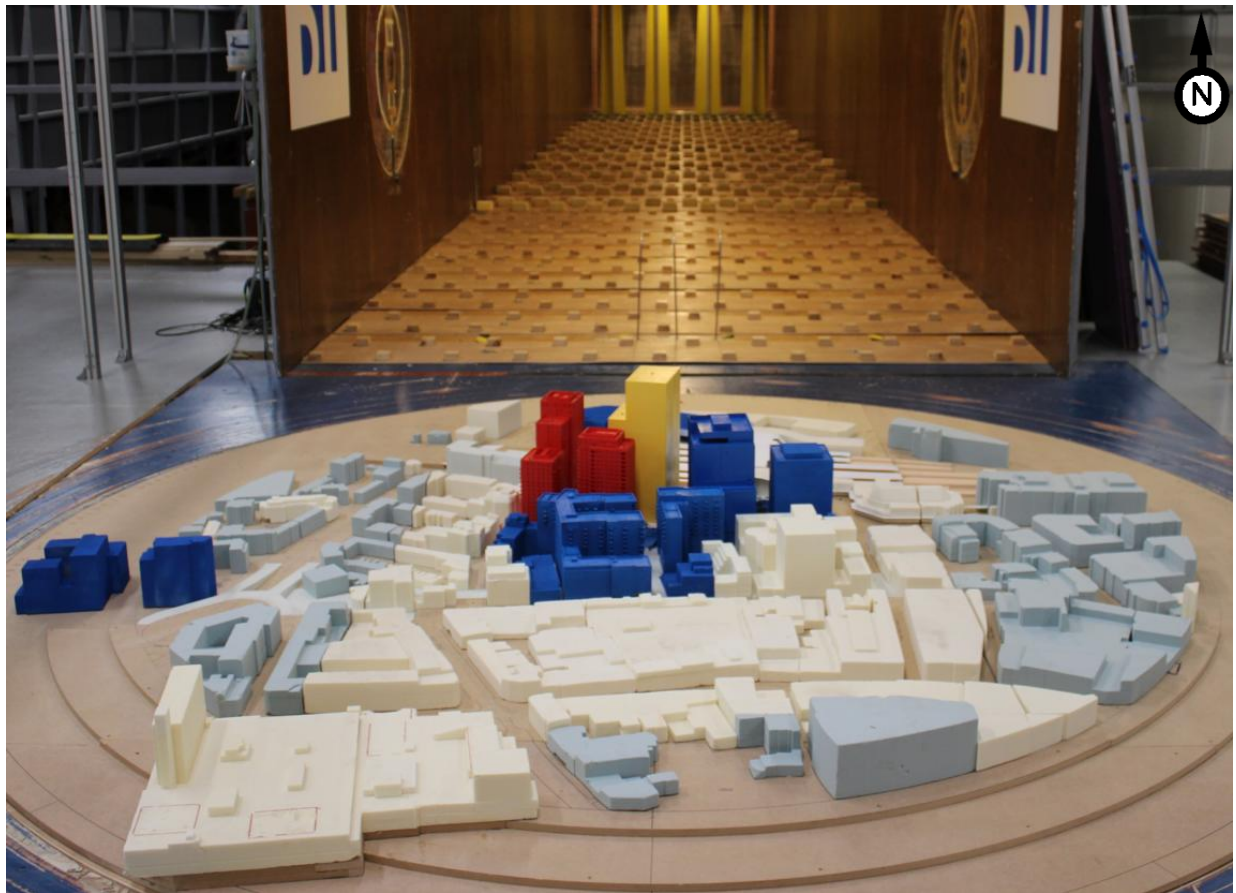


Figure 1: Image of Configuration 2 (View in the wind tunnel from the south)

## 2.2 Measurement Technique

Wind speed measurements were made using Irwin probes. For pedestrian comfort studies, both the mean wind speed and the peak wind speed are measured at each location at a scaled height of 1.5m above ground level. The typical equivalent full-scale time period for measuring the mean wind speed is around 90 minutes, whereas the peak wind speed is taken as the wind speed exceeded for 1% of the time.

Wind speeds at each location were measured for 36 wind directions in 10° intervals, with 0° representing a wind blowing from the north and 90° a wind blowing from the east.

## 2.3 Scaling

The length scale of the model was 1:300 and the velocity scale was approximately 1:2 for strong winds. Consequently, the time scale for the tests was 1:150, or in other words 1 second in the wind tunnel is equivalent to 150 seconds at full scale. The sampling frequency for the data acquisition equipment is therefore adjusted for the time scale.

## 2.4 Meteorological Data

Meteorological data derived from the meteorological stations at London City and Heathrow airports have been corrected to standard conditions of 10m above open flat level country terrain and is presented as wind roses by season in Figure 2. The assessment presented in this report focusses on winter, the windiest season, representing a 'worst-case' season for windy conditions between December and February and a summer season (representing a time of the year when amenity spaces are expected to be most usable between June and August). The radial axis indicates the percentage time per season that the wind speed exceeds the particular range of wind speeds.

The meteorological data indicate that the prevailing wind direction throughout the year are from the south-west. This is typical for many areas of southern England. There is a secondary peak from the north-east, especially during the spring which tends to have cold winds.

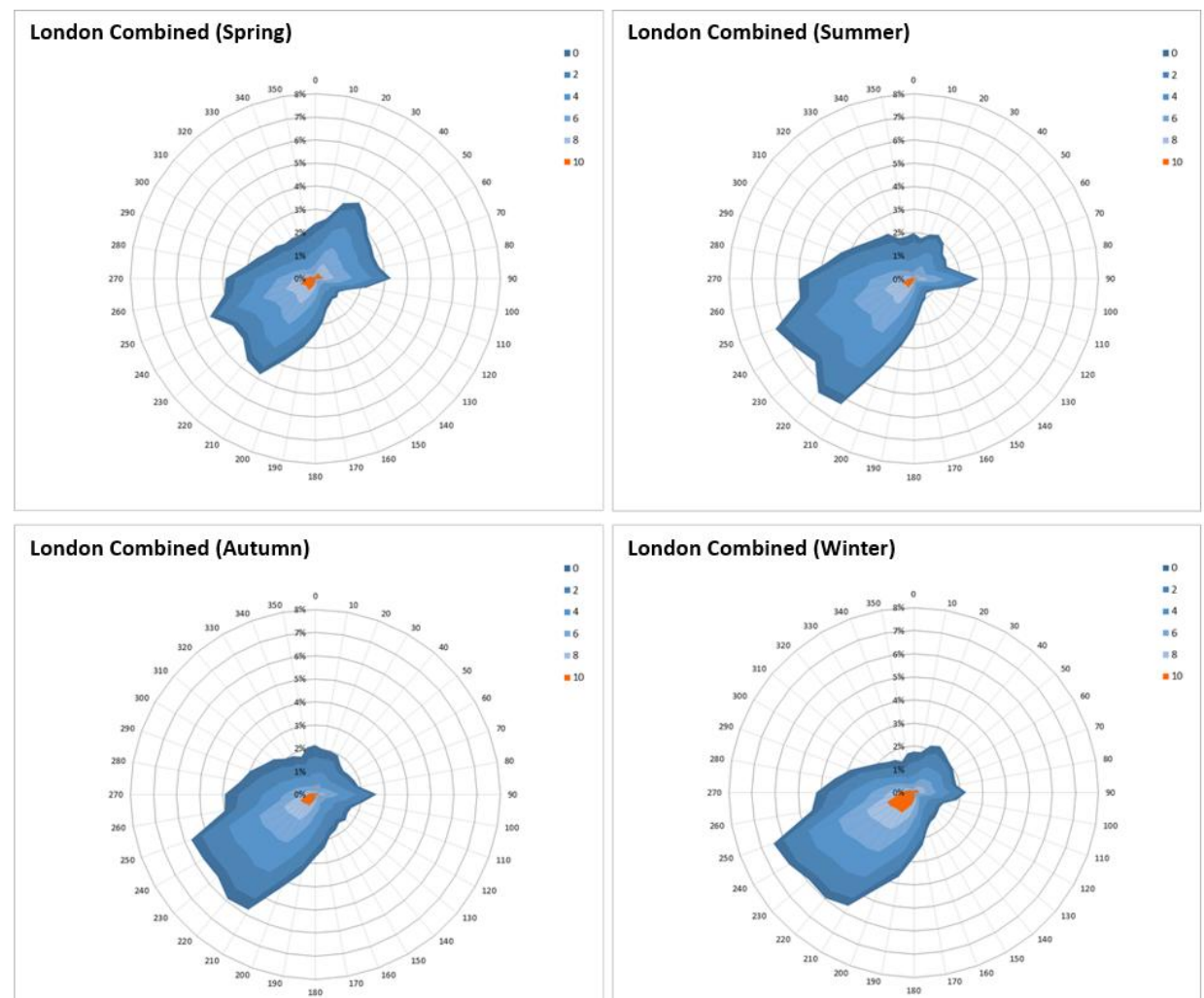


Figure 2: Seasonal Wind Roses for London City and Heathrow Airports combined (Radial axis indicates the percentage of time for which the stated wind speed (m/s) threshold is exceeded)

## 2.5 Pedestrian Comfort

The assessment of the wind conditions requires a standard against which the measurements can be compared. This report uses the Lawson Comfort Criteria, which have been established for over thirty years. The Criteria, which seek to define the reaction of an average pedestrian to the wind, are described in Table 1. If the measured wind conditions exceed the threshold wind speed for more than 5% of the time, then they are unacceptable for the stated pedestrian activity and the expectation is that there may be complaints of nuisance or people will not use the area for its intended purpose.

The Criteria set out four pedestrian activities and reflect the fact that less active pursuits require more benign wind conditions. The four categories are sitting, standing, strolling and walking, in ascending order of activity level, with a fifth category for conditions that are uncomfortable for all uses. In other words, the wind conditions in an area for sitting need to be calmer than a location that people merely walk past. The distinction between strolling and walking is that in the strolling scenario pedestrians are more likely to take on a more leisurely pace, with the intention of taking time to move through the area, whereas in the walking scenario pedestrians are intending to move through the area quickly and are therefore expected to be more tolerant of windier conditions.

The Criteria are derived for open air conditions and assume that pedestrians will be suitably dressed for the season. Thermal comfort is discussed with reference to acceptable wind environments but not evaluated as part of the assessment.

Table 1: Lawson Comfort Criteria

| Key                                                                                 | Comfort Category | Threshold | Description                                                                                                                    |
|-------------------------------------------------------------------------------------|------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------|
|  | Sitting          | 0-4 m/s   | Light breezes desired for outdoor restaurants and seating areas where one can read a paper or comfortably sit for long periods |
|  | Standing         | 4-6 m/s   | Gentle breezes acceptable for main building entrances, pick-up/drop-off points and bus stops                                   |
|  | Strolling        | 6-8 m/s   | Moderate breezes that would be appropriate for window shopping and strolling along a city/town centre street, plaza or park    |
|  | Walking          | 8-10 m/s  | Relatively high speeds that can be tolerated if one's objective is to walk, run or cycle without lingering                     |
|  | Uncomfortable    | >10 m/s   | Winds of this magnitude are considered a nuisance for most activities, and wind mitigation is typically recommended            |

## 2.6 Strong Winds

Lawson also specified a lower limit strong wind threshold when winds exceed 15m/s for more than 2.2 hours of the year (or 0.025% of the time). Exceedance of this threshold may indicate a need for remedial measures or a careful assessment of the expected use of that location, e.g. is it reasonable to expect cyclists or elderly or very young pedestrians to be present at the location on the windiest day of the year? Wind Speeds that exceed 20m/s for more than 2 hours of the year represent safety issue for all members of the population, which would require mitigation to provide an appropriate wind environment.



Strong winds are generally associated with areas which would be classified as acceptable for walking or as uncomfortable. In a mixed-use urban development scheme, walking and uncomfortable conditions would not usually form part of the 'target' wind environment and would usually require mitigation due to pedestrian comfort considerations. This mitigation would also reduce the frequency of, or even eliminate, any strong winds.

## 2.7 Desired Pedestrian Activity around the Development

Typically, the target conditions would be:

1. Strolling use during the windiest season on pedestrian thoroughfares (with walking conditions potentially being tolerated in areas where pedestrians would not linger);
2. Standing conditions at entrances, drop off areas or taxi ranks, and bus stops throughout the year;
3. Standing use at private amenity areas where seating is not designated (such as balconies) during the summer season; and
4. Sitting use conditions at outdoor seating and amenity areas during the summer season when these areas are more likely to be frequently used by pedestrians. It is noted that in large mixed-use amenity spaces a mixture of sitting use and standing / entrance use can be considered acceptable as users can choose to sit in 'calmer' areas, with 'windier' areas acceptable for more active pursuits.

The walking classification is avoided because of the association with occasional strong winds, unless they are on a minor pedestrian route or a route where pedestrian access could be controlled in the event of strong winds.

Achieving an sitting classification in the summer usually means that the same location would be acceptable for standing in the windiest season because winds are stronger at this time.

This is considered an acceptable occurrence for the majority of external amenity spaces where sitting is ad hoc and because other factors such as air temperature and precipitation influence people's perceptions about the 'need' to use seating or private amenity in the windiest season.



### 3 STATEMENT OF LIMITATIONS

This report entitled Pedestrian Level Wind Microclimate Technical Appendix dated March 10<sup>th</sup>, 2026, was prepared by RWDI for SH Reading Master LLP ("Client"). The findings and conclusions presented in this report have been prepared for the Client and are specific to the development described herein ("Project"). The conclusions and recommendations contained in this report are based on the information available to RWDI when this report was prepared. Because the contents of this report may not reflect the final design of the Project or subsequent changes made after the date of this report, RWDI recommends that it be retained by Client during the final design stage to verify that the results and recommendations provided in this report have been correctly interpreted in the final design of the Project.

The conclusions and recommendations contained in this report have also been made for the specific purpose(s) set out herein. Should the Client or any other third party utilise the report and/or implement the conclusions and recommendations contained therein for any other purpose or project without the involvement of RWDI, the Client or such third party assumes any and all risk of any and all consequences arising from such use and RWDI accepts no responsibility for any liability, loss, or damage of any kind suffered by Client or any other third party arising therefrom.

Finally, it is imperative that the Client and/or any party relying on the conclusions and recommendations in this report carefully review the stated assumptions contained herein and to understand the different factors which may impact the conclusions and recommendations provided.



## 4 ASSUMPTIONS AND LIMITATIONS

The findings included in this report are based on the following information (“Project Data”) disclosed to RWDI:

- Initial design freeze pack – received 3<sup>rd</sup> December 2025;
- Updated design freeze and landscaping information – received 15<sup>th</sup> December 2025; and
- Red line boundary – received 20<sup>th</sup> January 2026.

The recommendations and conclusions are based on the following assumptions:

- The Project Data is accurate and complete;
- The Proposed Development, when built, does not deviate substantially from the information listed above. “Substantially” in this case means any change to the exterior form of the buildings that would change the wind flow around it, in a way that would impact pedestrian comfort or safety.
- Sensitive areas of the Site (such as amenity spaces) are expected to be used in line with the temporal specifications set out in the report body.

Any change in the Project Data or Project Specific Conditions not reflected in this report can impact and/or alter the recommendations and conclusions in this report. Therefore, it is incumbent for the Client and/or any other third party relying on the recommendations and conclusions in this report to contact RWDI in the event of any change in the Project Data and Project Specific Conditions in order to determine whether any such change(s) may impact the assumptions upon which the recommendations and conclusions were made.

Finally, the recommendations and conclusions in this report are partially based on historical data and can be affected by a number of external factors, including but not limited to Project design, quality of materials and construction, site conditions, meteorological events, and climate change. As such, the conclusions and recommendations contained in this report do not list every possible outcome.

## APPENDIX A: WIND TUNNEL PHOTOS

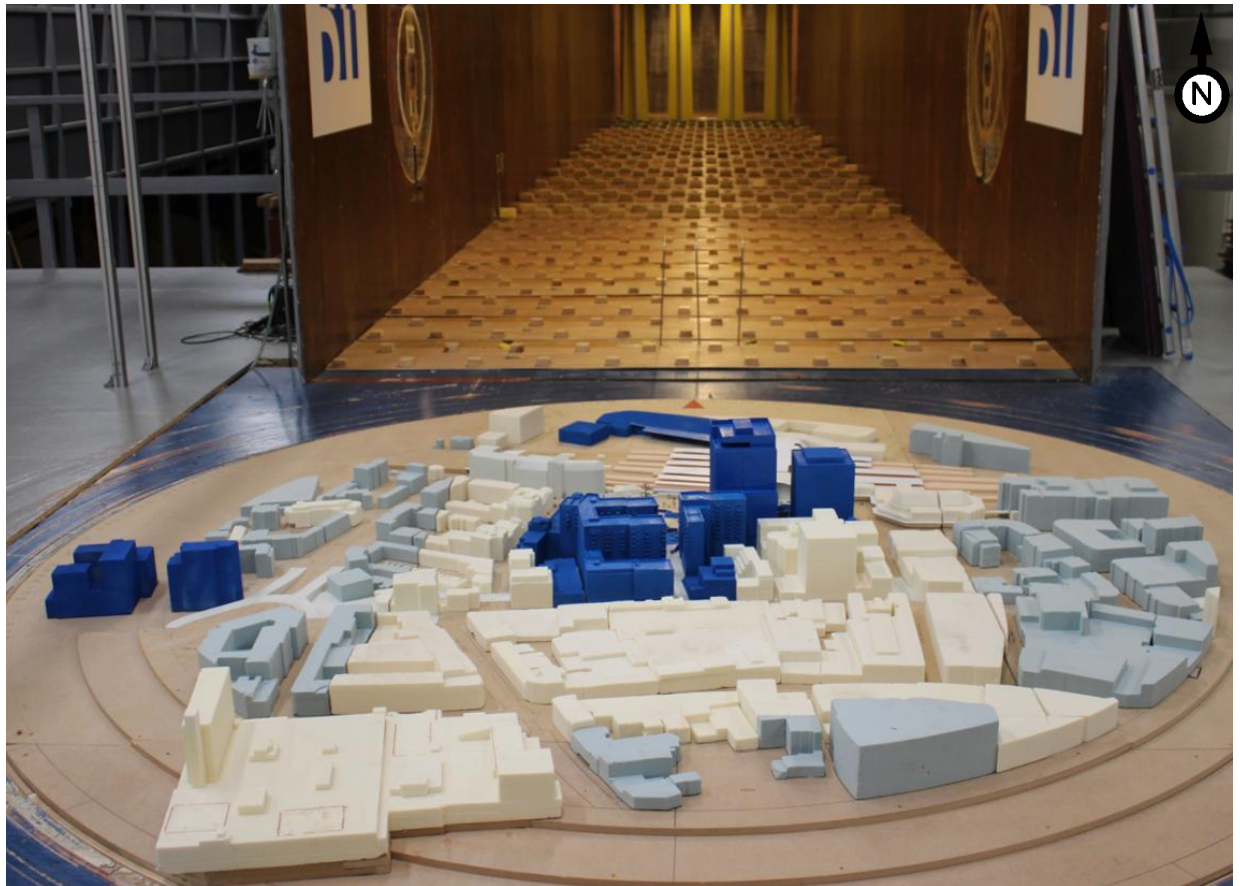


Figure 3 – Existing Site with Existing Surrounding Buildings and Existing Landscaping (Configuration 1)  
– view of the model (from the south)

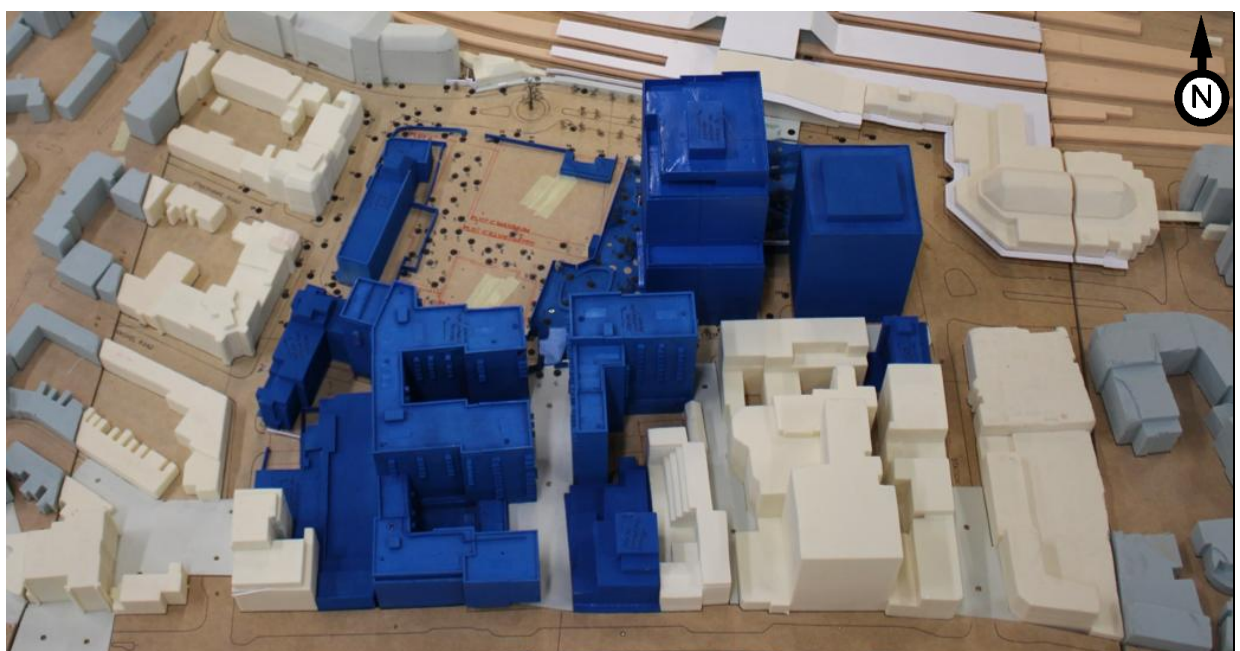


Figure 4 – Existing Site with Existing Surrounding Buildings and Existing Landscaping– view of the  
model (from the south)

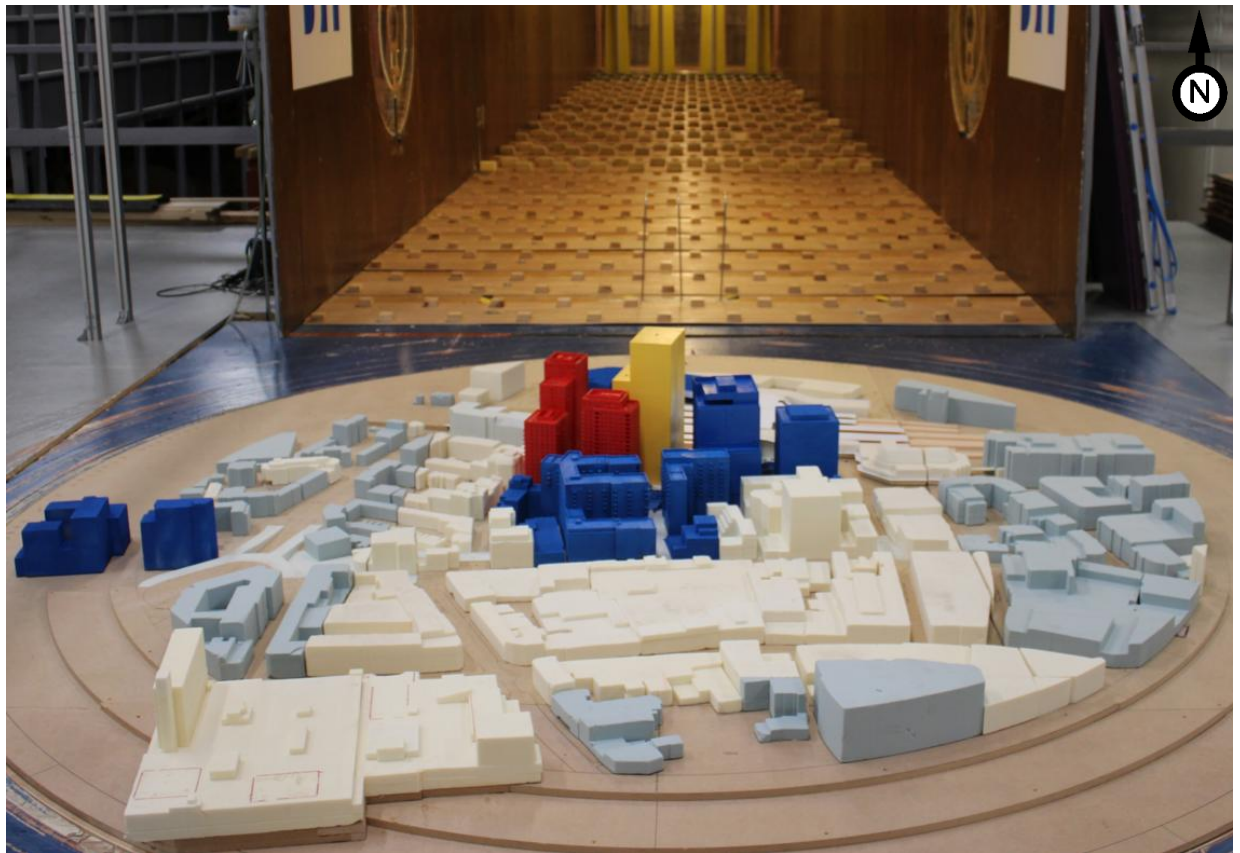


Figure 5 – Proposed Development (Phase 3) with Plot C (Illustrative Scheme), Existing Surrounding Buildings and Existing Landscaping – view of the model (from the south)

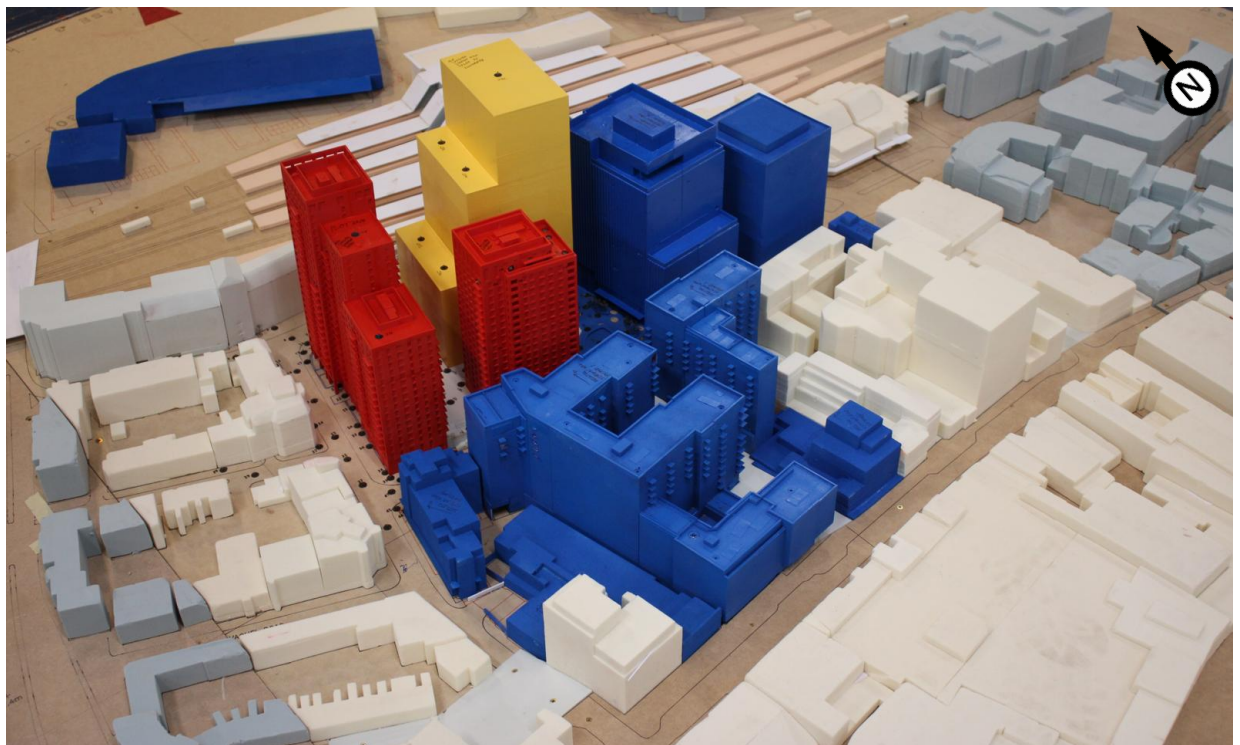


Figure 6 – Proposed Development (Phase 3) with Plot C (Illustrative Scheme), Existing Surrounding Buildings and Existing Landscaping – view of the model (from the south-west)

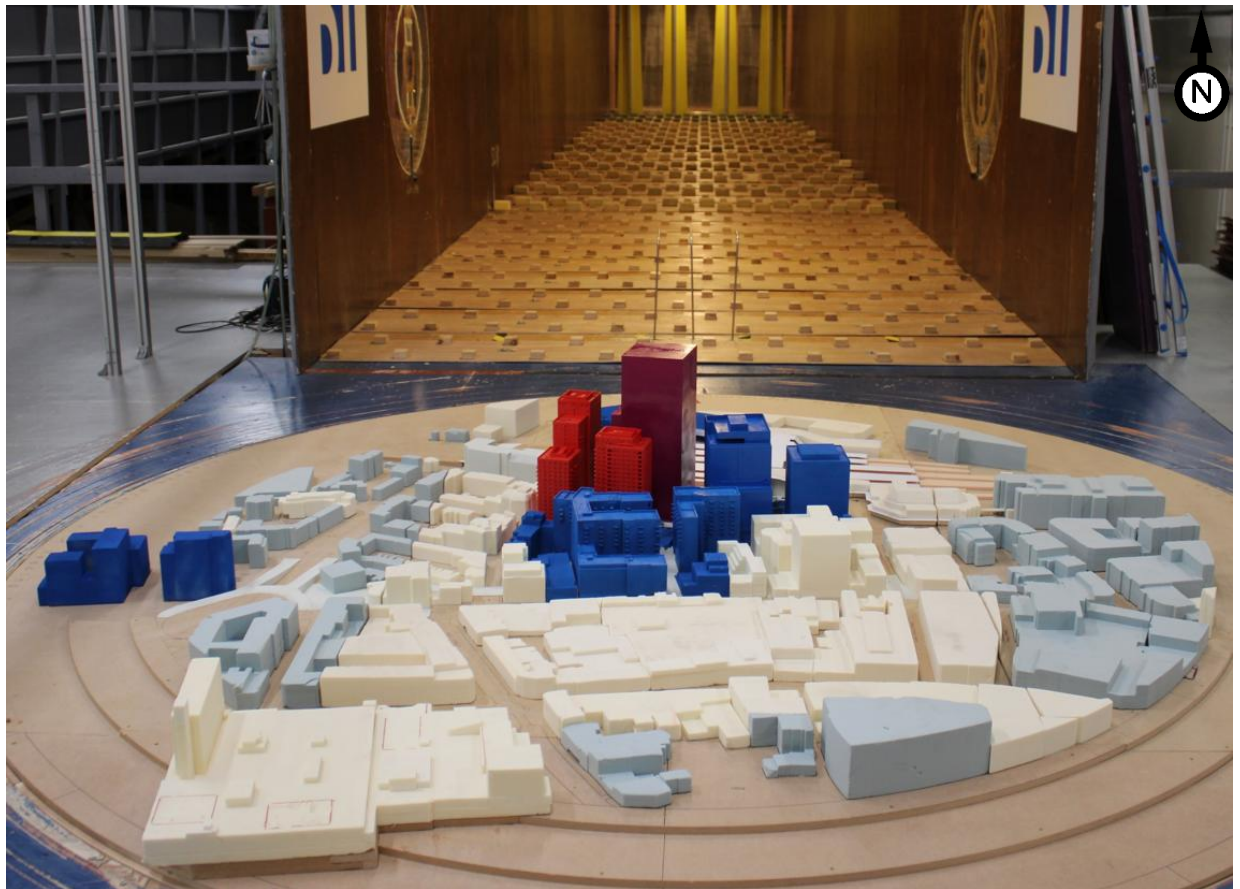


Figure 7 – Proposed Development (Phase 3) with Plot C (Maximum Parameters Scheme) Existing Surrounding Buildings – view of the model (from the south)

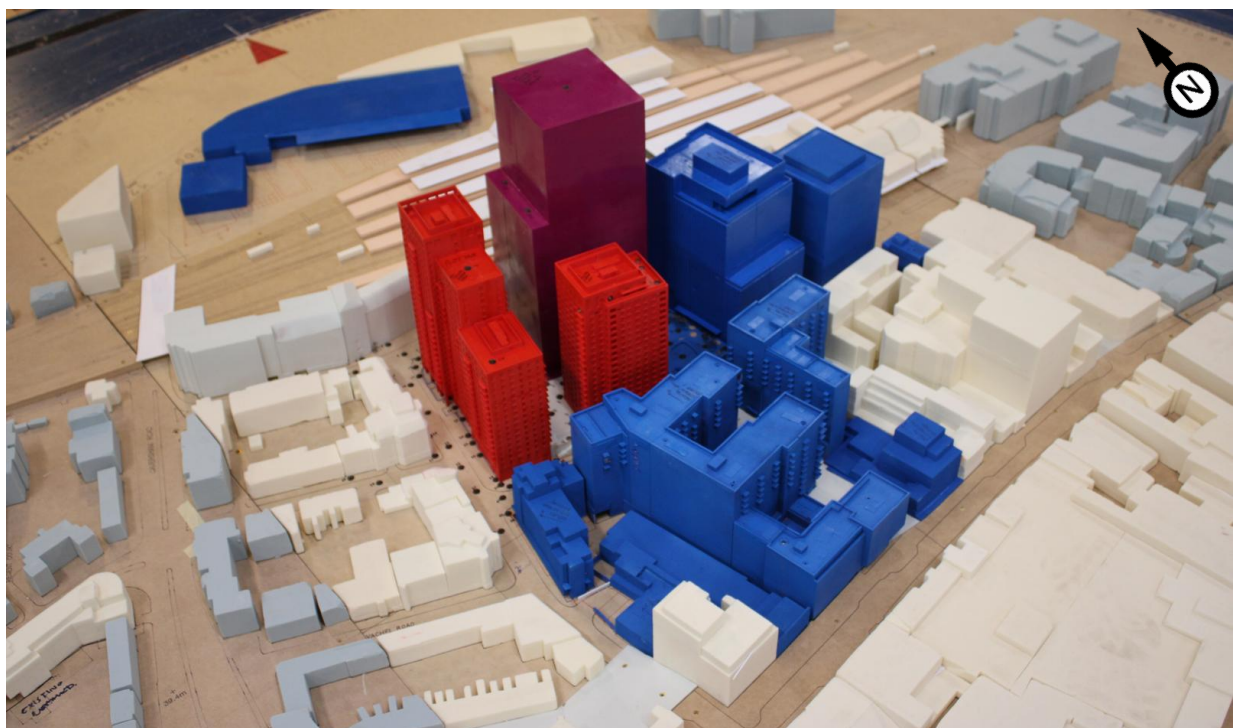


Figure 8 – Proposed Development (Phase 3) with Plot C (Maximum Parameters Scheme) Existing Surrounding Buildings – view of the model (from the south-west)

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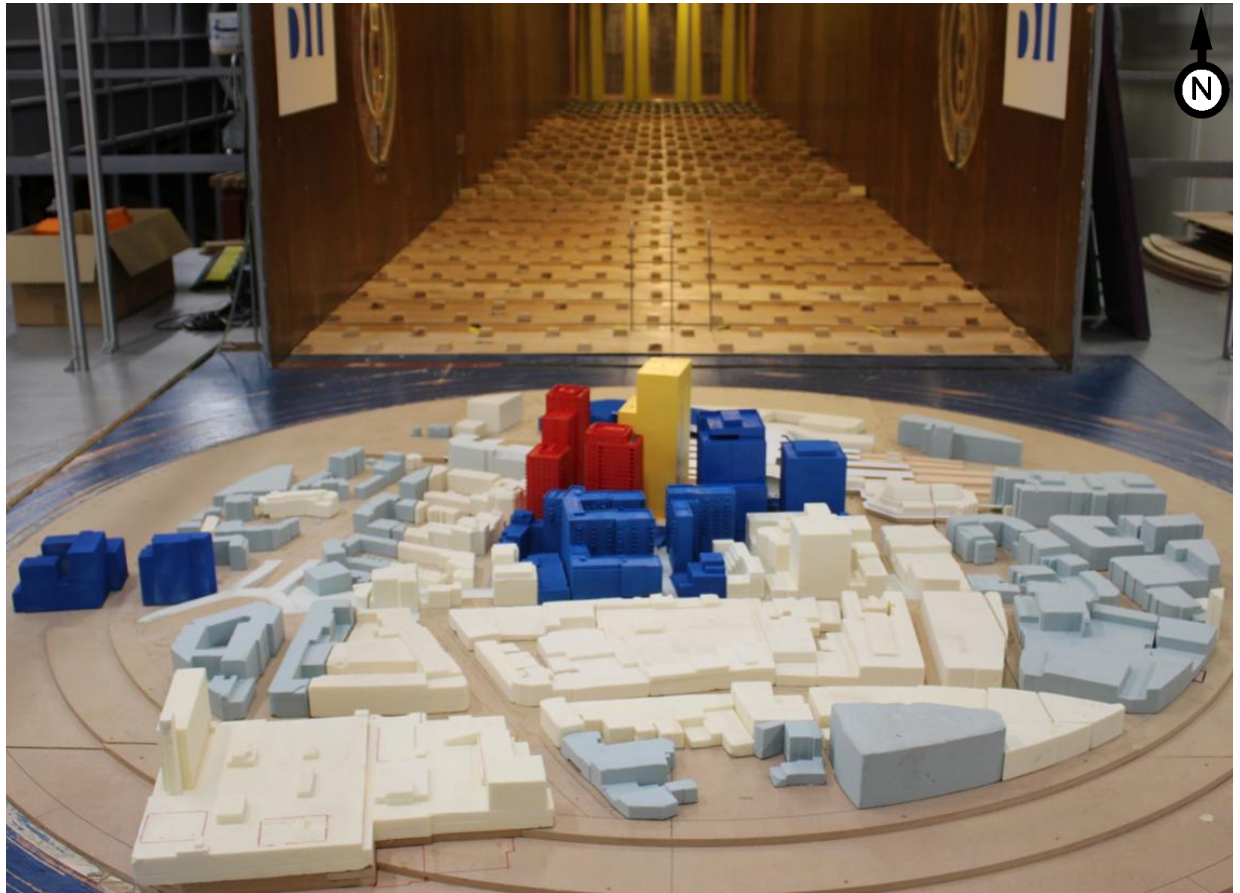


Figure 9 – Proposed Development (Phase 3) with Plot C (Illustrative Scheme), Existing Surrounding Buildings, Proposed and Existing Landscaping – view of the model (from the south)

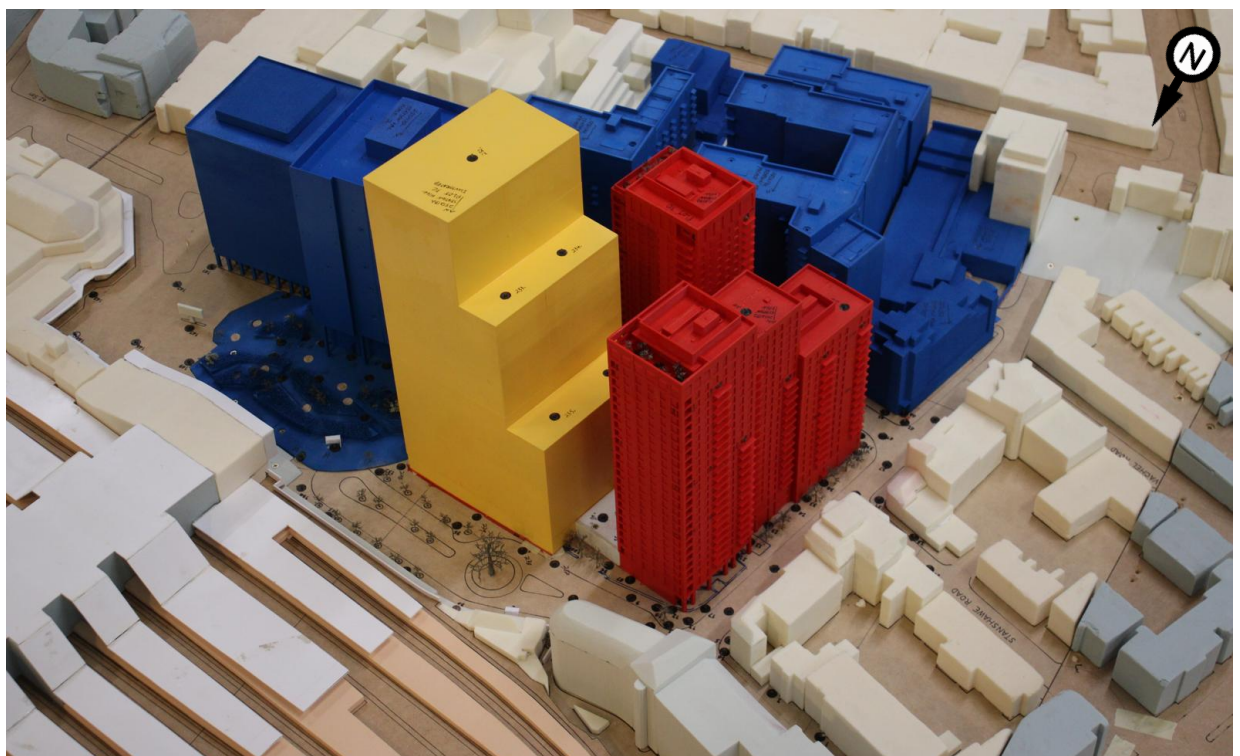


Figure 10 – Proposed Development (Phase 3) with Plot C (Illustrative Scheme), Existing Surrounding Buildings, Proposed and Existing Landscaping – view of the model (from the north-west)

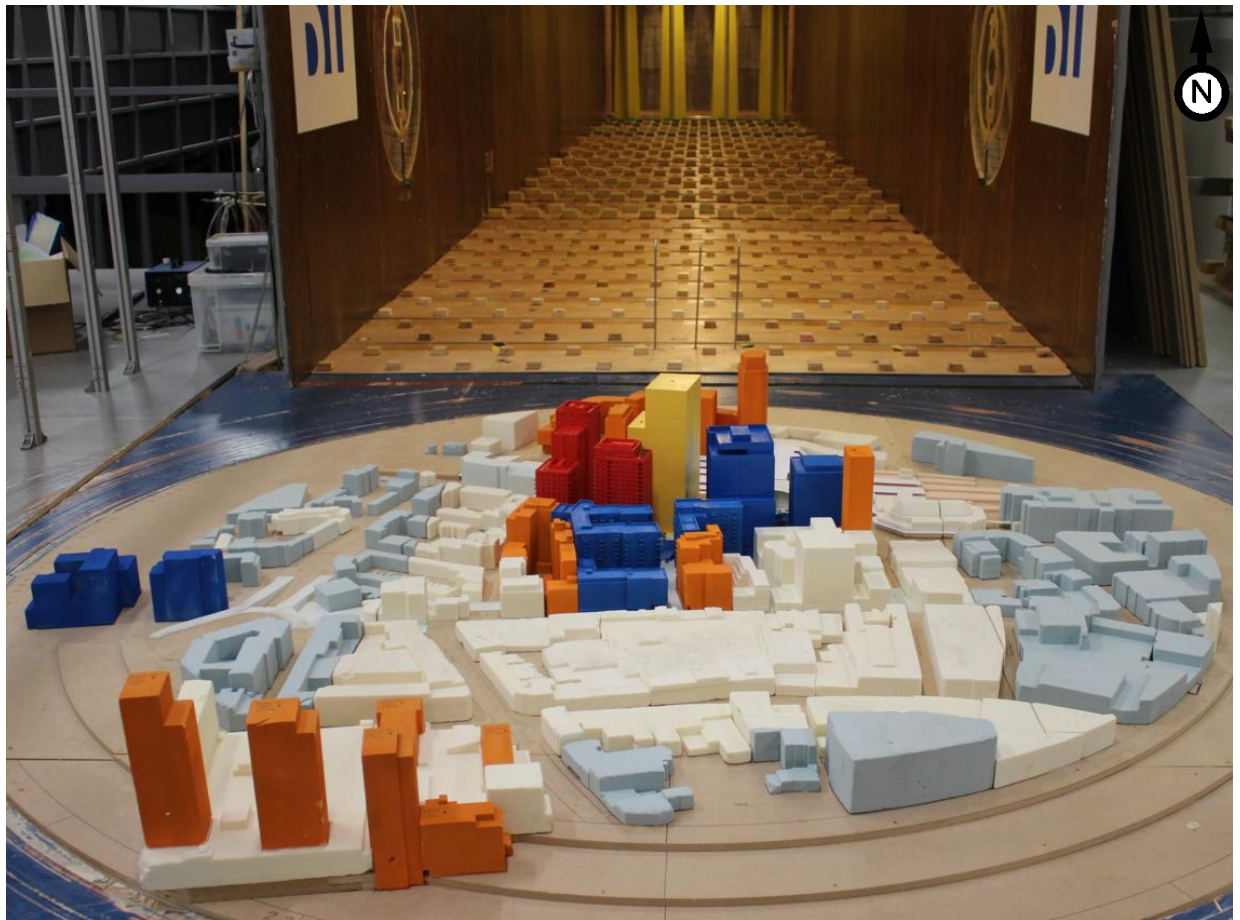


Figure 11 – Proposed Development (Phase 3) with Plot C (Illustrative Scheme), Cumulative Surrounding Buildings and Existing Landscaping – view of the model (from the south)

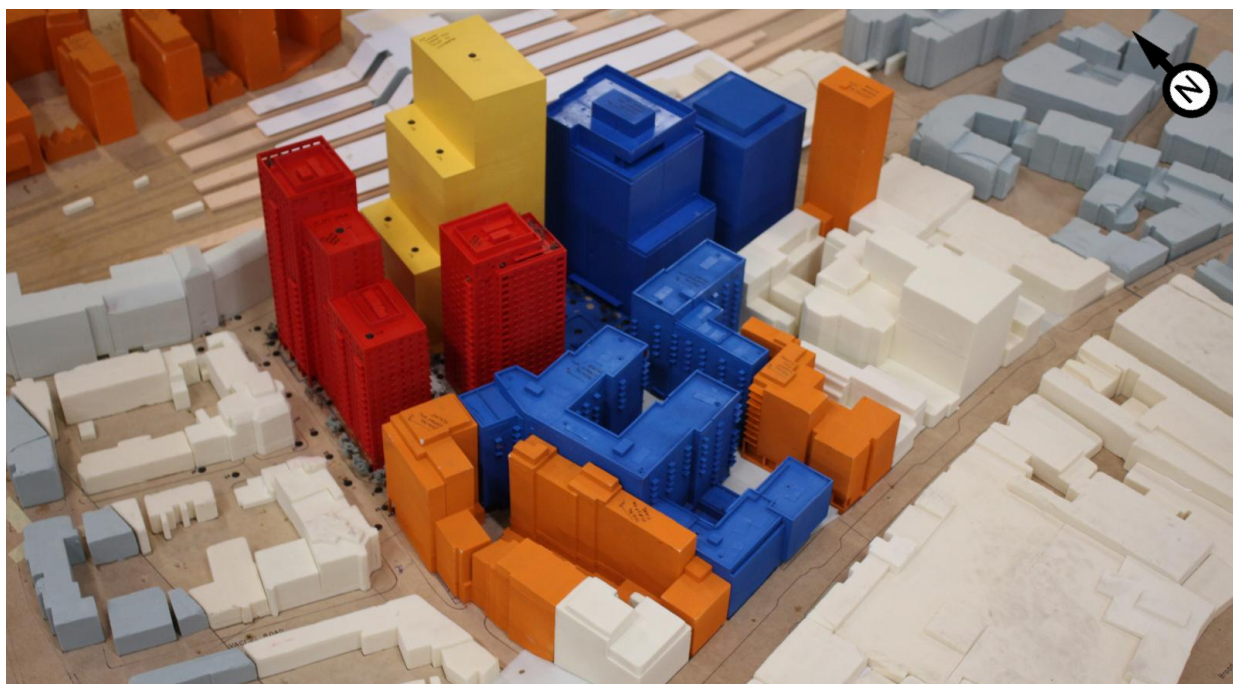


Figure 12 – Proposed Development (Phase 3) with Plot C (Illustrative Scheme), Cumulative Surrounding Buildings and Existing Landscaping – view of the model (from the south-west)

## APPENDIX B: PROPOSED LANDSCAPING



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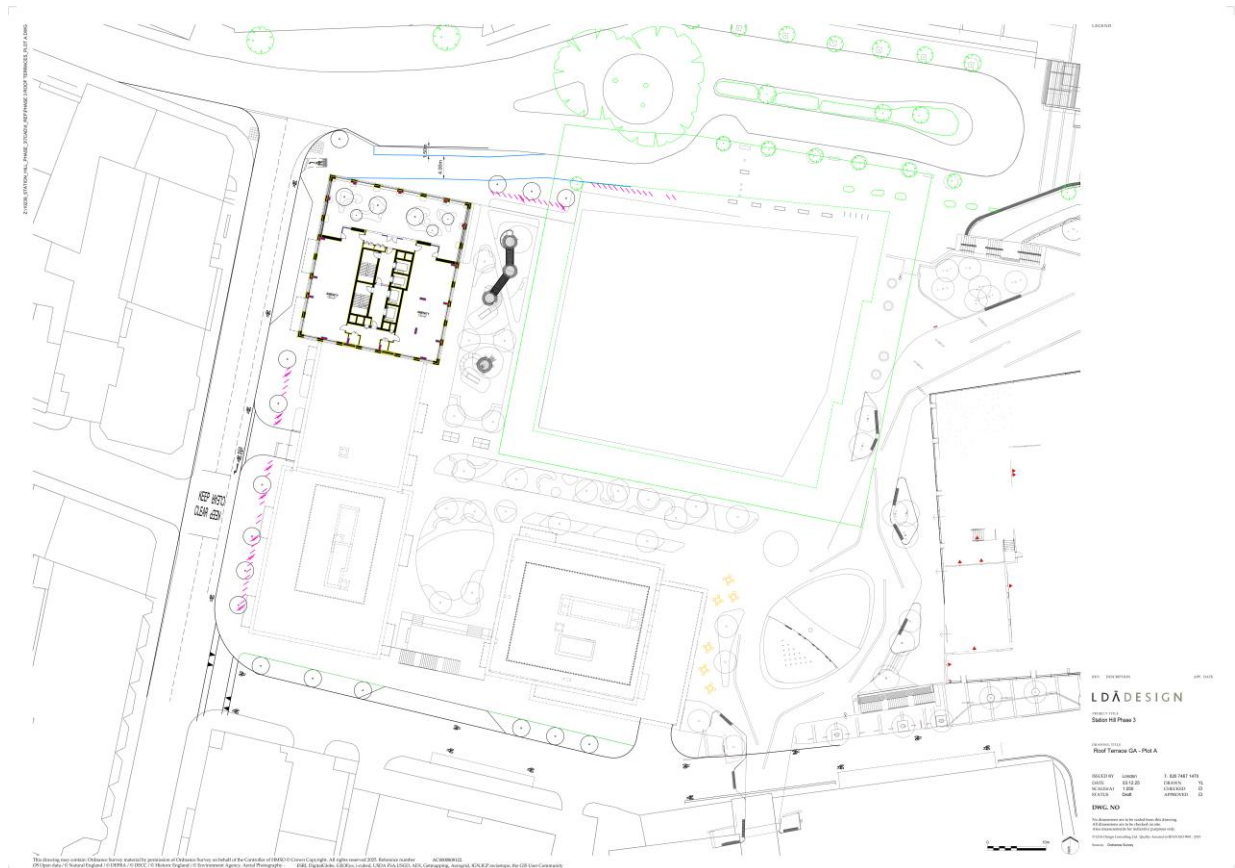


Figure 14 – Proposed landscaping at roof level on Plot A ('Phase 3 Roof Terrace GA - Plot A)

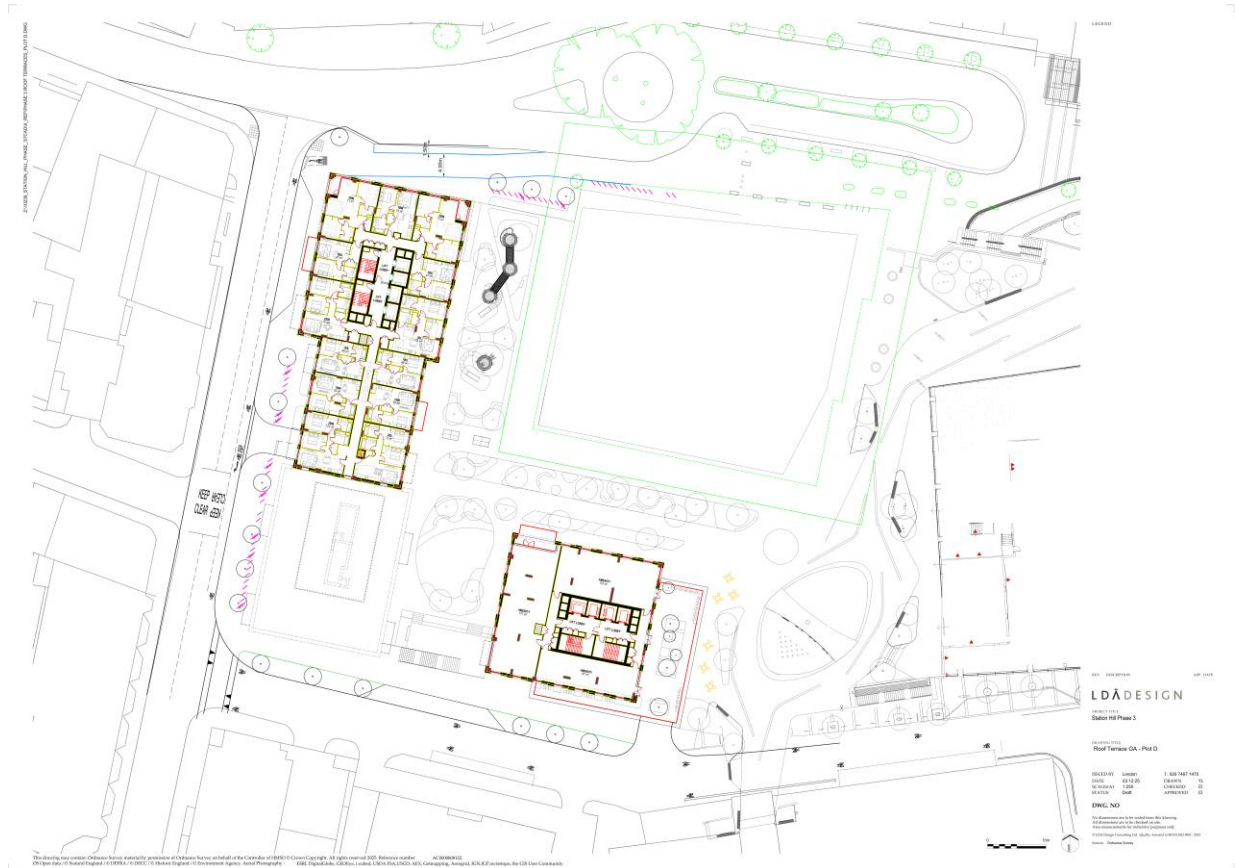


Figure 15 – Proposed landscaping at roof level on Plot D ('Phase 3 Roof Terrace GA - Plot D')

## APPENDIX C: MITIGATION MEASURES

1. Proposed Landscaping
2. Tree arrangement changed at north-west corner of Block A. Now featuring two deciduous trees (7-9m tall), with 1m tall planting underneath
3. Canopy on the north side of Block A (1.5m deep, 16.5m long, 50% open)
4. Three trees at the north-east corner of Block A changed from deciduous to evergreen
5. Four trees on the west side of Block B changed from deciduous to evergreen
6. Canopy on the west side of Block B (1.5m deep, 28m long, 50% open)
7. Two evergreen trees (7-9m tall) with 1m tall planting underneath
8. Three baffles (3m above ground, 3m tall and 3m wide, 50% porous)
9. One evergreen tree on pathway (7-9m tall)
10. Tree arrangement changed from three deciduous trees, to two evergreen trees (7-9m tall)
11. Two off-site evergreen trees (7-9m tall)
12. Canopy on the west side of Block D (1.5m deep, 15m long, 50% open)
13. Added planting (1m tall) two trees (5m tall and deciduous) and fencing (1.5m tall) south of the podium near the staircase



Figure 14 – Mitigation measures on the north side of Phase 3

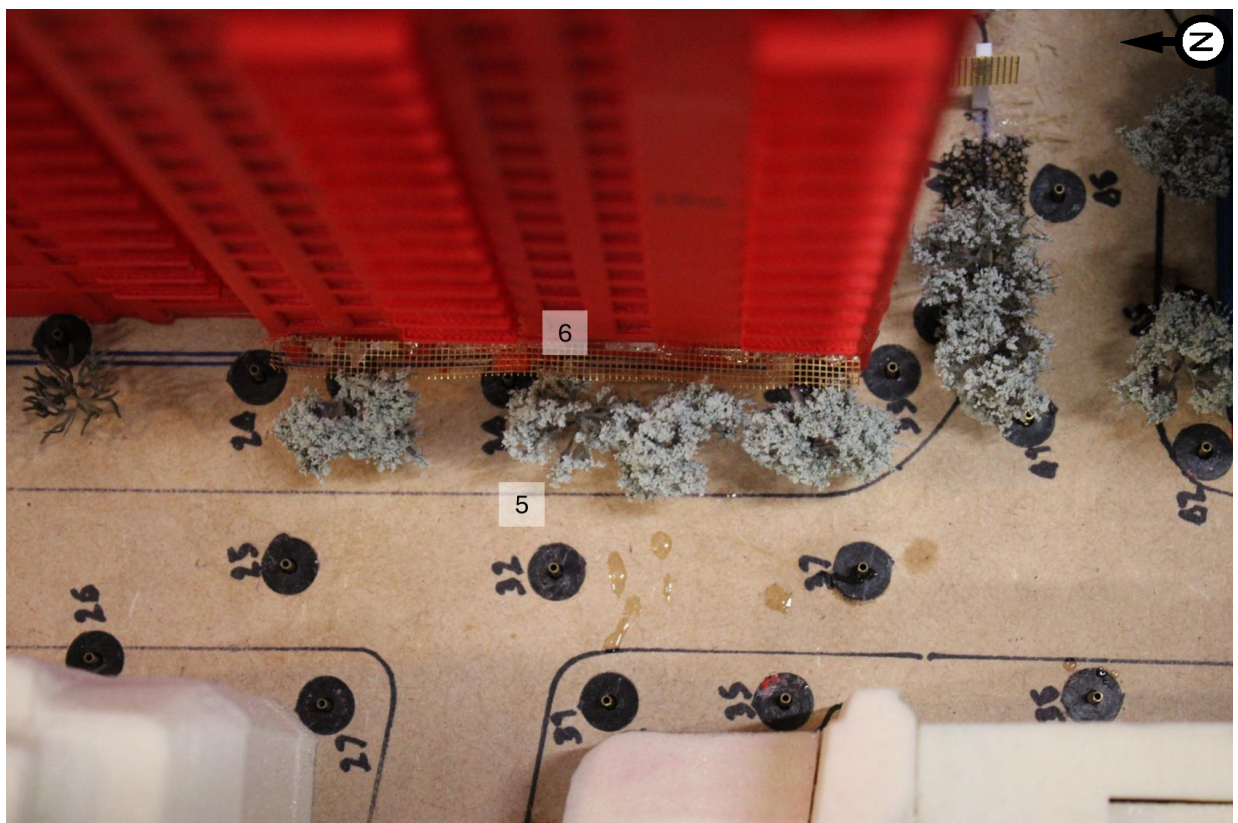


Figure 15 – Mitigation measures on the west side of Phase 3

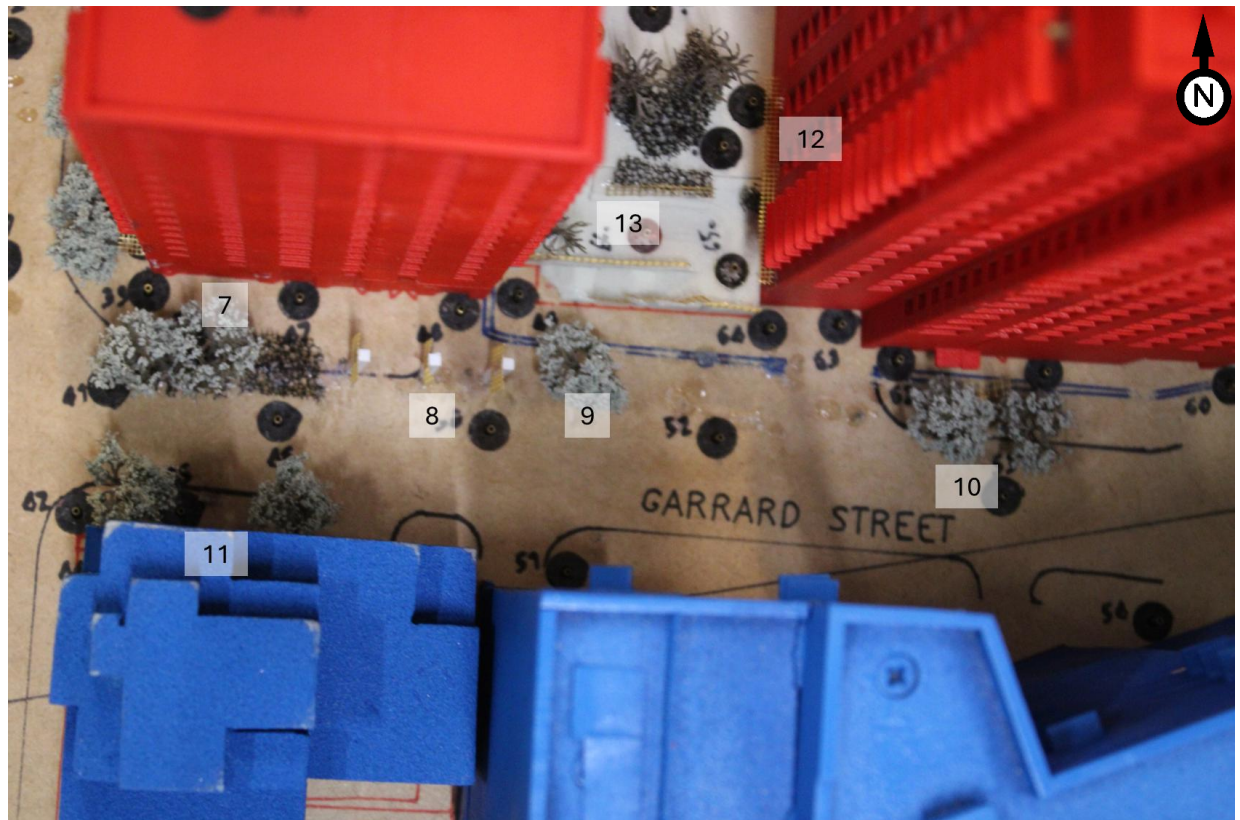


Figure 15 – Mitigation measures on the south side of Phase 3