FUTURE
PLANNING AND DEVELOPMENT

Great Brighams Mead, Reading RG1

DAYLIGHT & SUNLIGHT ASSESSMENT

Two-storey rooftop extension

September 2022

Document Issue Register

1.0 Draft Issue

1.1 Minor updates

2.0 Revised scheme

2.1 Minor updates

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1 Introduction

1.1 This report details a Daylight & Sunlight Assessment for the proposed extension at Great Brighams Mead, Reading RG1. The proposal entails the erection of a 2-storey rooftop extension comprising 72no. flats.

1.2 The existing building is a 3-storey office building which benefits from permitted development (PD) approval from office to residential.

1.3 The proposed extension has been designed with consideration to the existing neighbouring properties, and as such the roof of the extension will be pitched to minimise impact to the neighbouring habitable windows, and to visually replicate the form of the existing building.

1.4 The purpose of this report is to perform a daylight and sunlight assessment for the habitable rooms of the surrounding residential properties, and to compare with guidance provided by the BRE (BR209: Site Layout Planning for Daylight and Sunlight 2022).

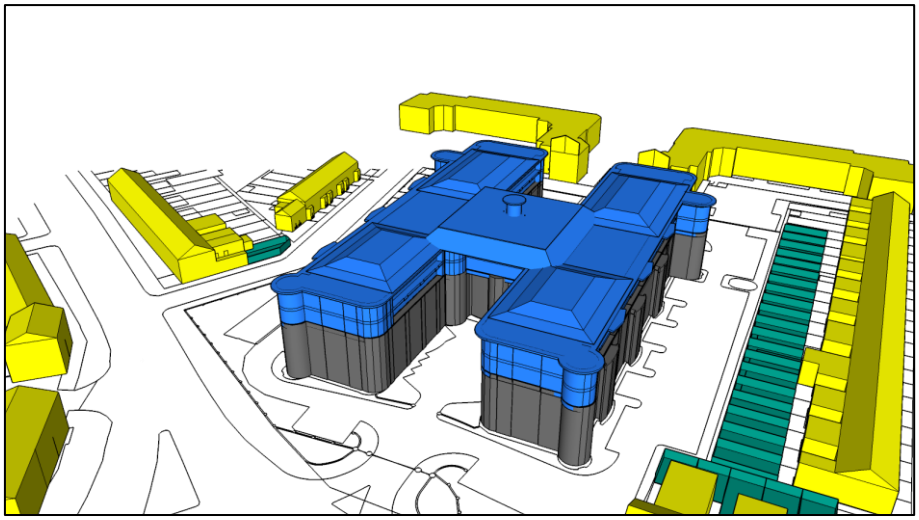

Figure 1: Proposed extension (blue), 3D daylight model

2 Executive Summary

2.1 There are two components of natural light which need to be considered when assessing the impact of a proposed development on the surrounding residential properties, being the level of daylight and the annual sunlight hours. In terms of daylight levels to a window, the BRE recommends a Vertical Sky Component (VSC) of 27%, or not less than 0.8 times its former level.

2.2 The results of the daylight assessment indicate that all of the assessed neighbouring windows would meet the BRE guidance. Where windows have not met the 25° test, these have been shown to retain a VSC of 27% or not less than 0.8 times their former level. Thus the reduction in daylight levels to these windows would not be noticeable according to the BRE guidance.

2.3 In terms of Annual Probable Sunlight Hours (APSH), the results of the sunlight analysis indicate that the assessed windows have been shown to pass both the APSH tests (annual & winter).

2.4 The analysis shows that more than half the area of the amenity spaces of neighbouring properties would receive at least 2 hours of sunlight on 21st March.

2.5 The values of daylight levels and annual sunlight hours are thus considered to be acceptable for all surrounding properties, according to the BRE guidance.

Figure 2: Site (yellow), aerial view (source: Google Earth)

3 Planning Policies and Guidance

3.1 BRE Document 209 – Site Layout Planning for Daylight and Sunlight

3.2 The introduction to the BRE document 209: *Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice –3rd edition (Paul Littlefair, 2022)* states:

> *"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; it's aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design. In special circumstances the developer or Planning Authority may wish to use different target values. For example, in a historic city centre, or in an area with modern high-rise buildings, a higher degree of obstruction may be unavoidable if new developments are to match the height and proportions of existing buildings."*

3.3 National Planning Policy Framework 2021

3.4 Furthermore, the National Planning Policy Framework 2021 states that:

> *"Local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards)."*

4 Methodology

4.1 Measurement of Daylight

4.2 If a proposed development will fall beneath a 25° angle taken from the centre of the lowest window at an existing property, then no further assessment will be required. Furthermore, if the centre of a main window of the next door property lies on the extension side of a 45° line drawn in plan and elevation, then the extension may well cause a significant reduction in the skylight received by the window.

4.3 The second and third methods (NSC and ADF) require knowledge of the internal layout of the property being assessed, whilst the first method is determined solely on the external skyline obstructions. In this instance it is appropriate to assess the neighbouring properties based on the first method (VSC). The VSC methodology is defined as:

4.4 *"Ratio of that part of illuminance, at a point on given vertical plane, that is received directly from a CIE Standard Overcast Sky, to illuminate on a horizontal plane due to an unobstructed hemisphere of this sky."*

4.5 The VSC for a completely unobstructed CIE Standard Overcast Sky is 39.6%. The BRE guideline VSC for an existing window in a habitable room is 27%, or not less than 0.8 times its former value. This figure has been derived from a low-density suburban housing model. The BRE advises that these values are:

4.6 *"..purely advisory and different targets may be used based on the special requirements of the proposed development or its location."*

5 Measurement of Sunlight

5.1 The sunlight to a given window can be quantified using the Annual Probable Sunlight Hours (APSH) method. The unobstructed total in London (latitude 51.5°N) and southern England equates to 1486 hours. An indicator is provided in the BRE guide which is overlaid with 100 spots, each representing approximately 15 hours. Each spot which is uncovered by an obstruction can thus be counted to provide a single percentage of total APSH.

5.2 A more accurate estimation of the annual sunlight hours can be determined through numerical simulation, using a 3D model of the site including any surrounding obstructions. The sunlighting analysis has been performed using the 'Suncast' software module within the IES Virtual Environment.

5.3 The guideline criteria for assessing annual sunlight at a reference point (centre of window) of the main living room of an existing building is that it should receive 25% of APSH including at least 5% of APSH in winter and not less than 0.8 times its former value.

5.4 According to the BRE guidance, it is not always necessary to do a full calculation to check sunlight potential. The guideline above is met if the following is true:

- If the distance of each part of the new development from the existing window is three or more times its height above the centre of the existing window (obstructions within 90° of due north of the existing window need not count here);
- The window wall faces within 90° of due south and no obstruction, measured in the section perpendicular to the window wall, subtends an angle of more than 25° to the horizontal (again, obstructions within 90° of due north of the existing window need not be counted);
- The window wall faces within 20° of due south and the reference point has a VSC of 27% or more.

6 Daylight & Sunlight Analysis of Surrounding Properties

6.1 The surrounding properties which have been assessed include the following:

1. 106 Caversham Road
2. 1-9 Brigham Road (& Brigham Mews)
3. Regents Riverside
4. 1-31 De Montfort Road
5. 17 Vastern Road
6. West of Caversham Road

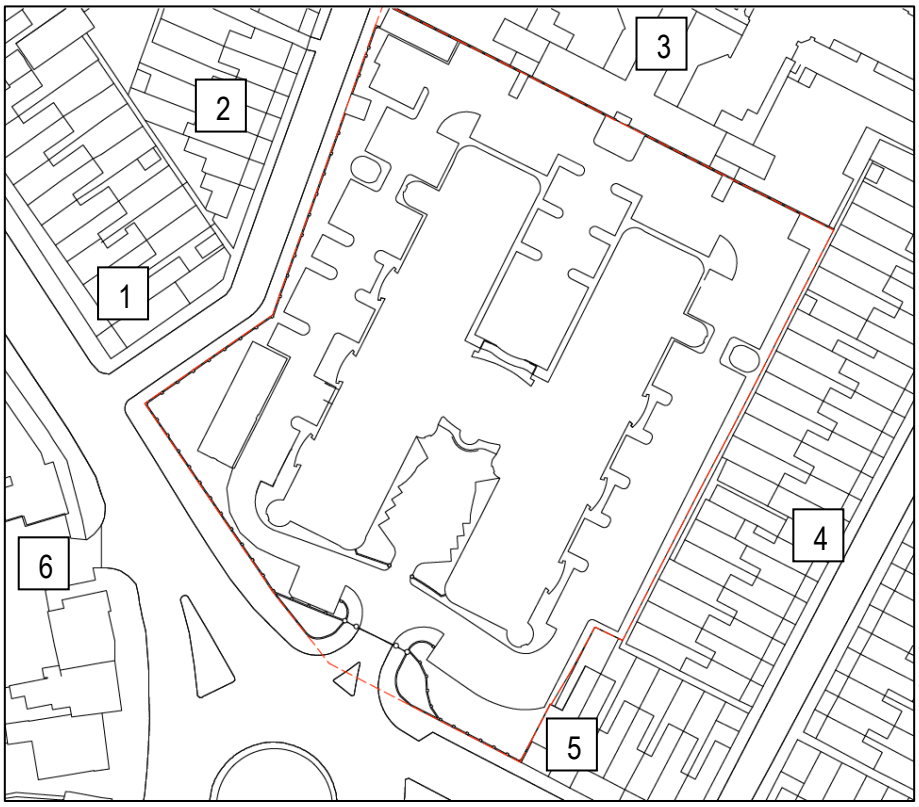

Figure 3: Location Plan – surrounding properties

6.2 106 Caversham Road

6.3 The side of the property is shown below (no ground floor windows facing development, 1st floor has been assessed), along with the 3D model indicating 25-degree line from centre of windows:

Figure 4: 106 Caversham Road

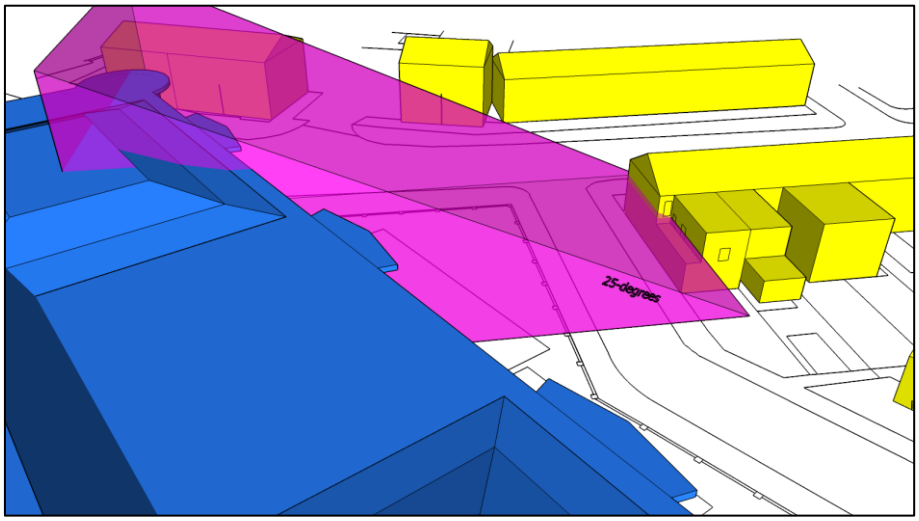

Figure 5: 3D Model – 25-degree line

6.4 A garden exists to the rear of the property, thus it is advisable to undertake sunlight (overshadowing) analysis for this amenity area. The BRE guidance states that at least half of the amenity area should receive at least 2 hrs of sunlight on 21st March.

6.5 The analysis shows that more than half of the amenity area would receive at least 2 hours of sunlight on 21st March. Indeed, 51.6% the amenity area would receive at least 2 hours of sunlight on 21st March (shaded areas below indicate >2hrs).

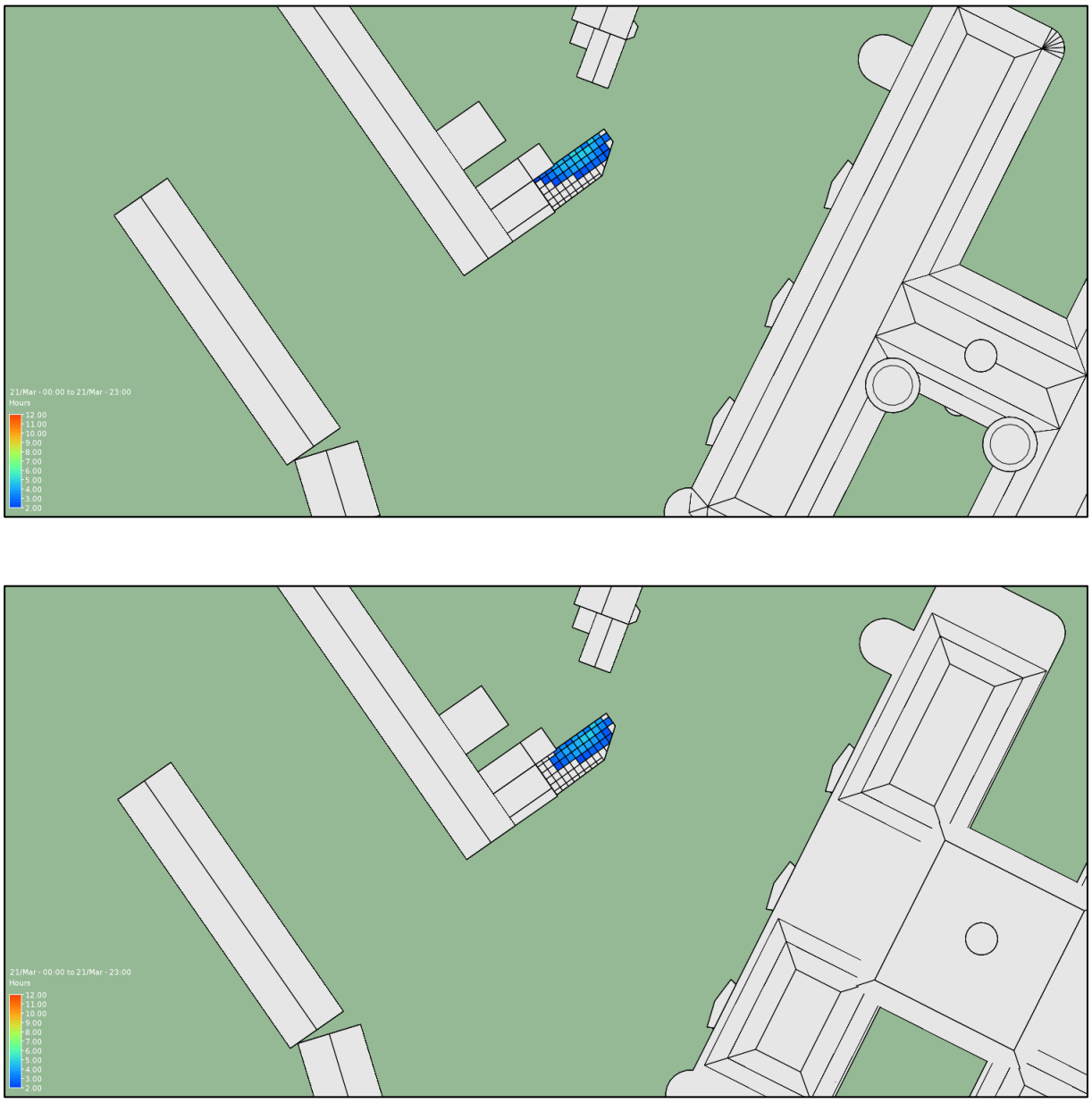

Figure 6: Amenity area 21 March (Existing & Proposed)

6.6 1-9 Brigham Road (& Brigham Mews)

6.7 The front of the properties are shown below (ground floor comprises habitable spaces), along with the 3D model indicating window ID's:

Figure 7: 1-9 Brigham Road

Figure 8: 3D Model – window ID's W1-8

6.8 Regents Riverside

6.9 The properties are shown below (lower ground floor comprises parking, 1st floor windows nearest the development have been assessed), along with the 3D model indicating window ID's:

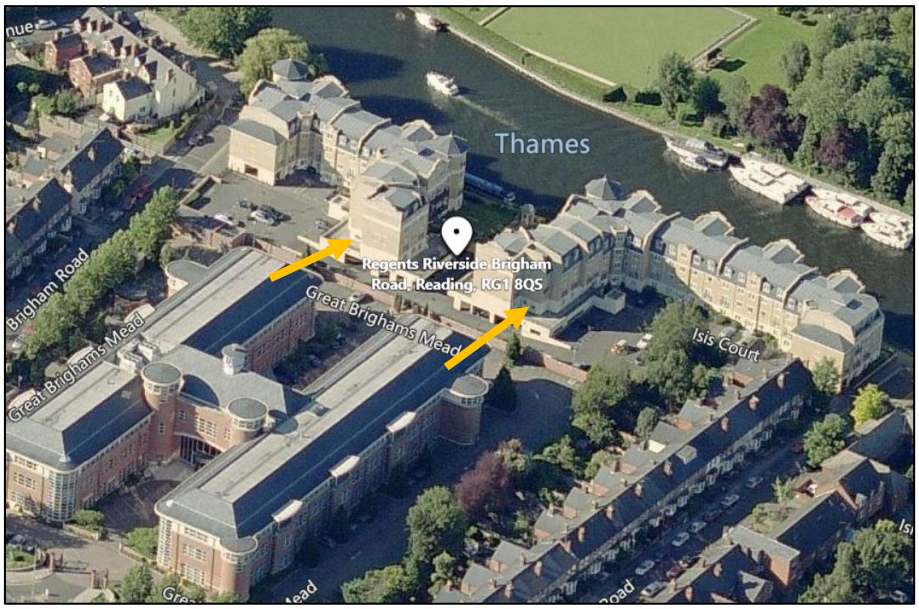

Figure 9: Regents Riverside (source: Bing Maps)

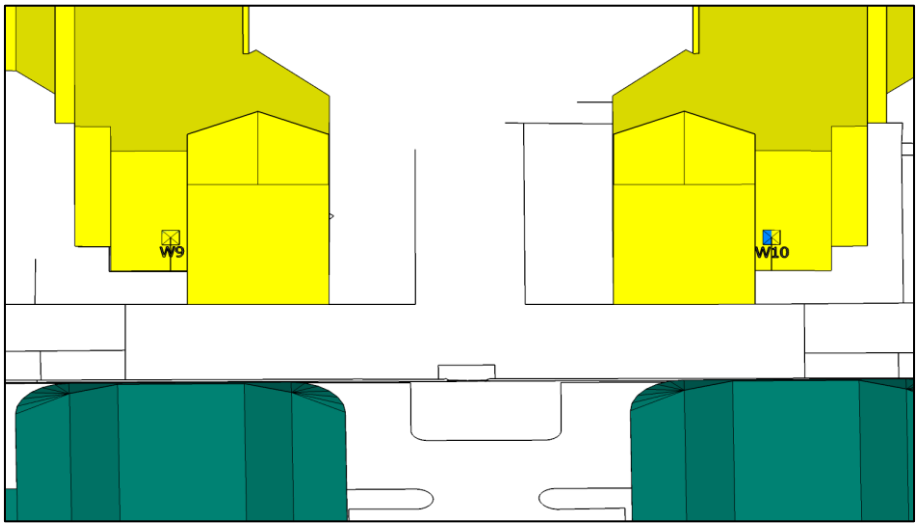

Figure 10: 3D Model – window ID's W9-10

6.10 Regents Riverside (Rear Lower Ground)

6.11 The location of the properties is indicated below (rear lower ground floor of 4-storey apartment block has been assessed), along with the 3D model indicating 25-degree line from centre of windows:

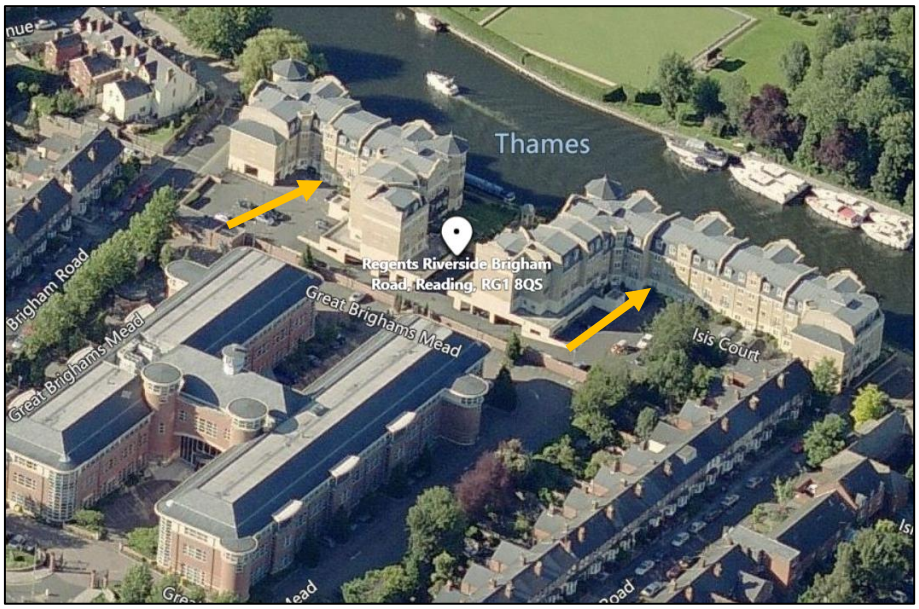

Figure 11: Regents Riverside (source: Bing Maps)

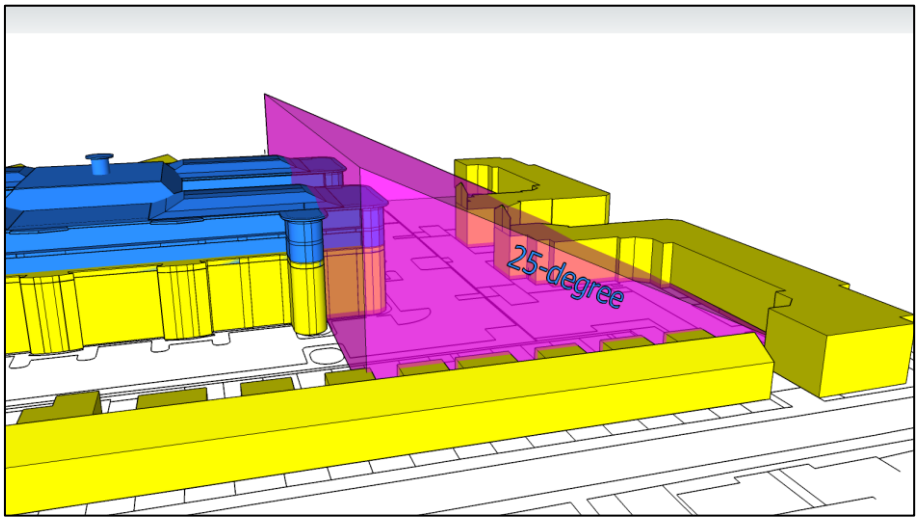

Figure 12: 3D Model – 25-degree line

6.12 1-31 De Montfort Road

6.13 The rear of the properties are shown below (ground floor comprises habitable spaces), along with the 3D model indicating window ID's:

Figure 13: 1-31 De Montfort Road (source: Bing Maps)

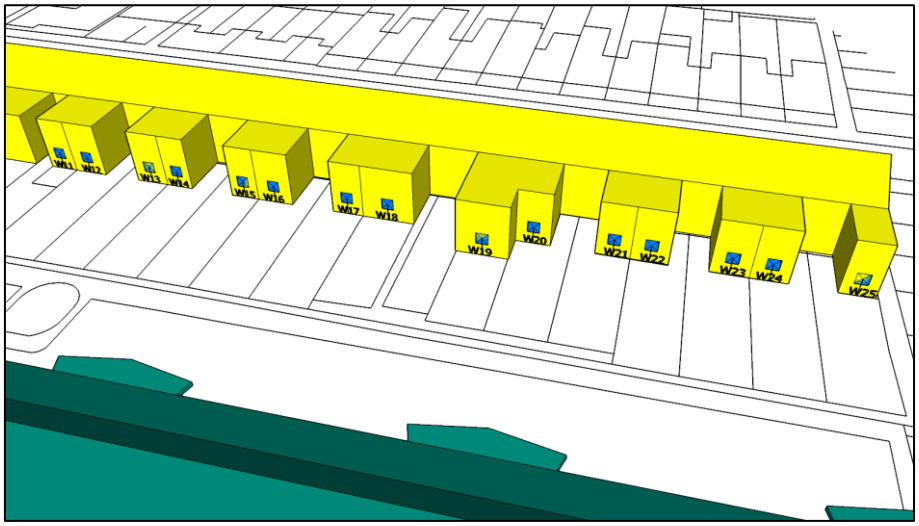

Figure 14: 3D Model – window ID's W11-25

6.14 Gardens exist to the rear of the properties (1-39 De Montfort Road), thus it is advisable to undertake sunlight (overshadowing) analysis for these amenity areas. The BRE guidance states that at least half of the amenity area should receive at least 2 hrs of sunlight on 21st March, or not less than 0.8 times its former value.

6.15 The analysis shows that the amenity areas would not experience any reduction in area receiving 2 hours of sunlight on 21st March.

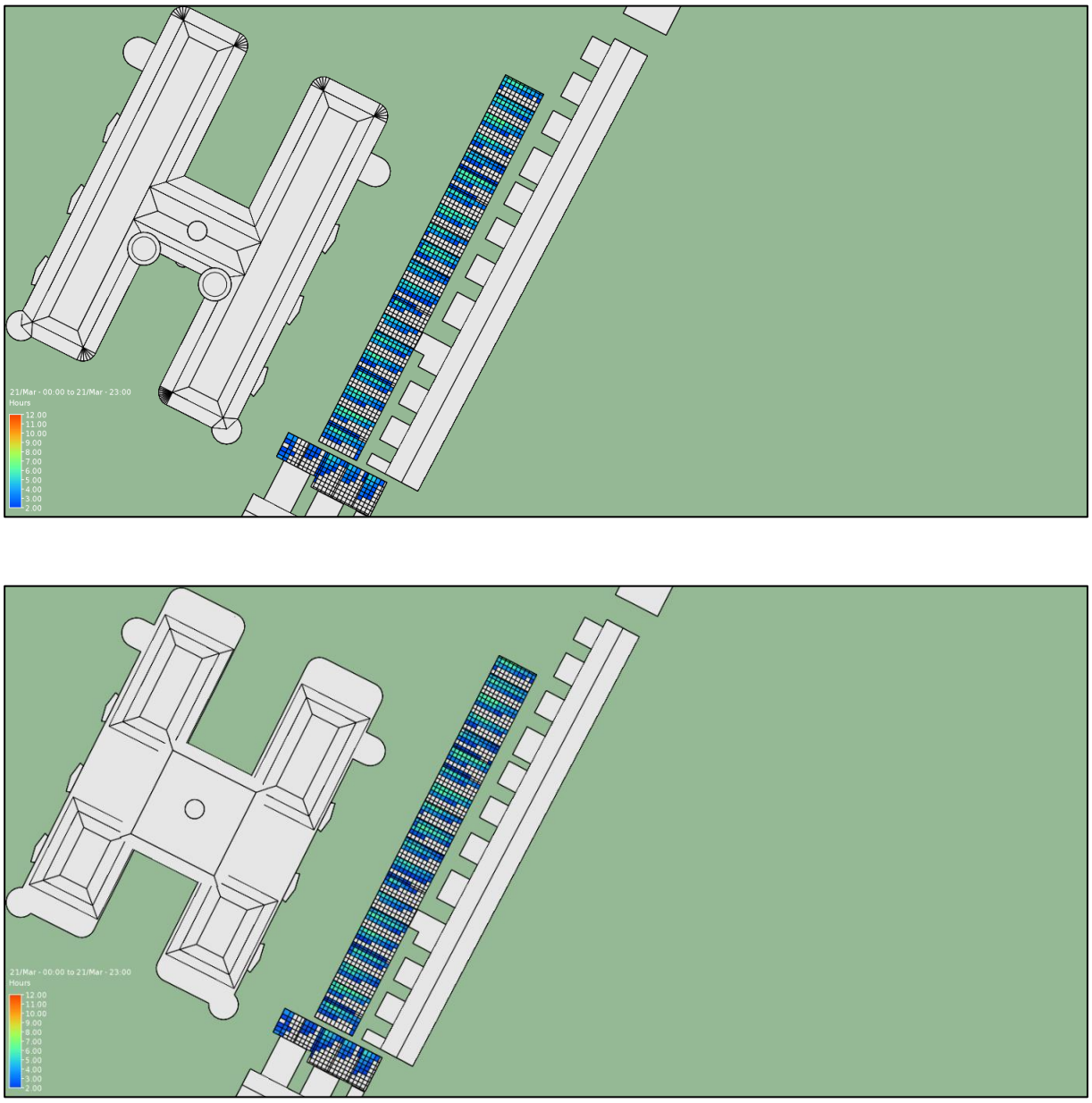

Figure 15: Amenity area 21 March (Existing & Proposed)

6.16 17 Vastern Road

6.17 The side of the property is shown below (ground floor comprises habitable spaces), along with the 3D model indicating window ID's:

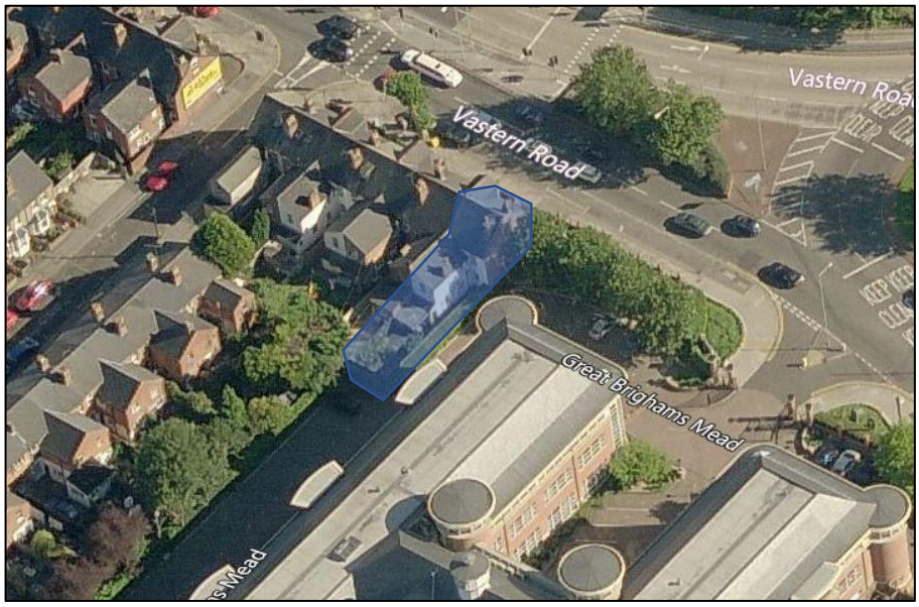

Figure 16: 17 Vastern Road (source: Bing Maps)

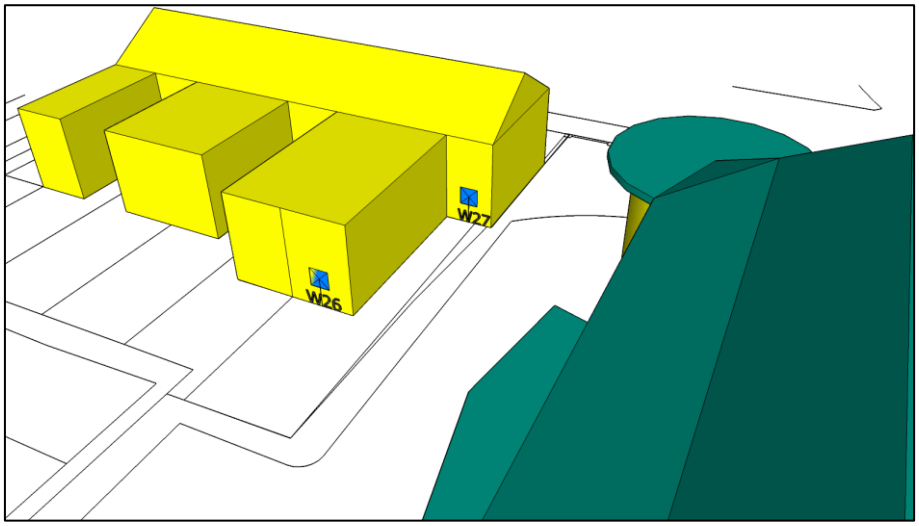

Figure 17: 3D Model – window ID's W26-27

6.18 Gardens exist to the rear of the properties (17-23 Vastern Road), thus it is advisable to undertake sunlight (overshadowing) analysis for these amenity areas. The BRE guidance states that at least half of the amenity area should receive at least 2 hrs of sunlight on 21st March, or not less than 0.8 times its former value.

6.19 The analysis shows that the amenity areas would not experience any reduction in area receiving 2 hours of sunlight on 21st March.

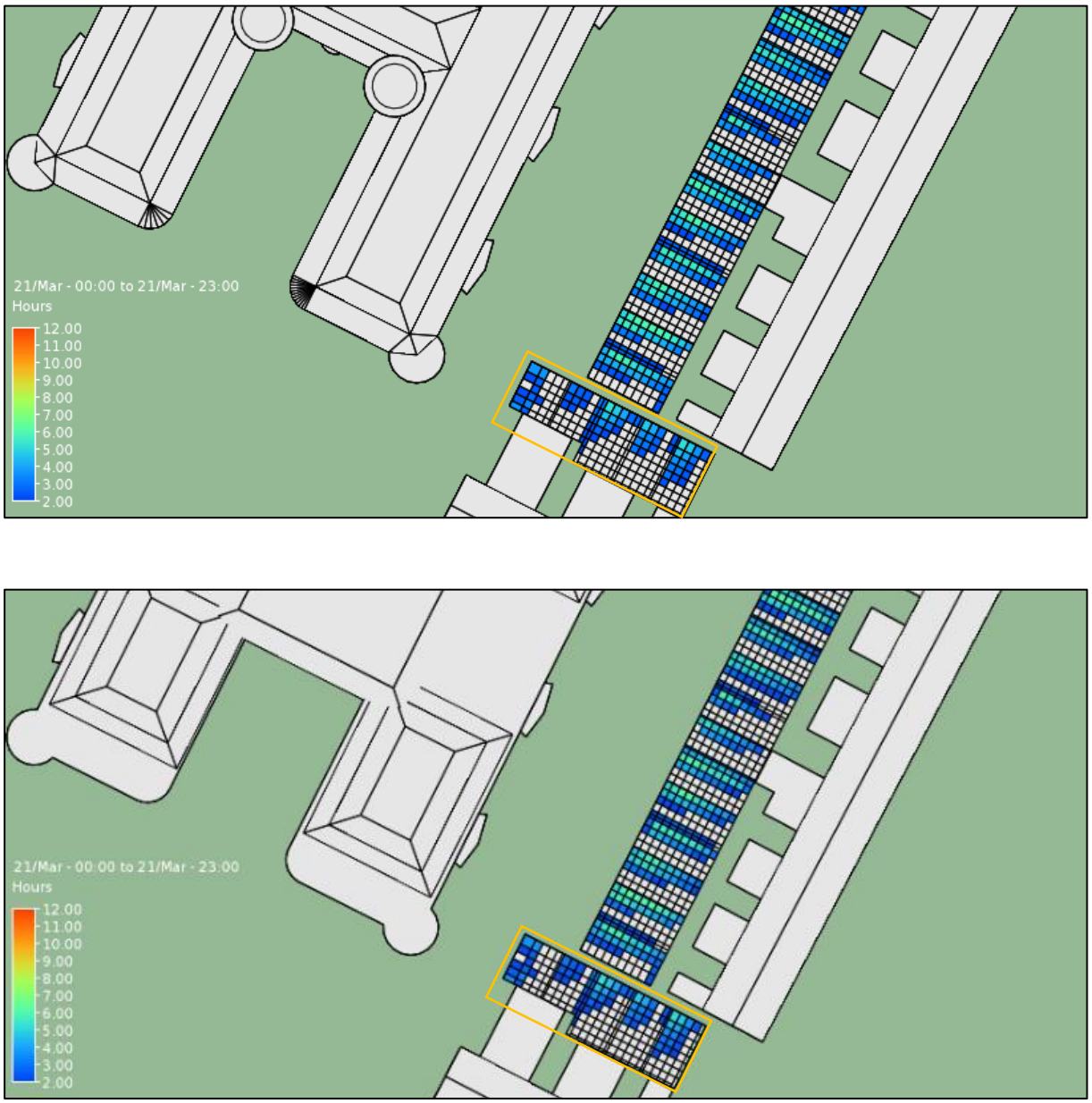

Figure 18: Amenity area 21 March (Existing & Proposed)

6.20 West of Caversham Road

6.21 The front of the properties are shown below (ground floor comprises retail use, 1st floor has been assessed), along with the 3D model indicating 25-degree line from centre of windows:

Figure 19: West of Caversham Road

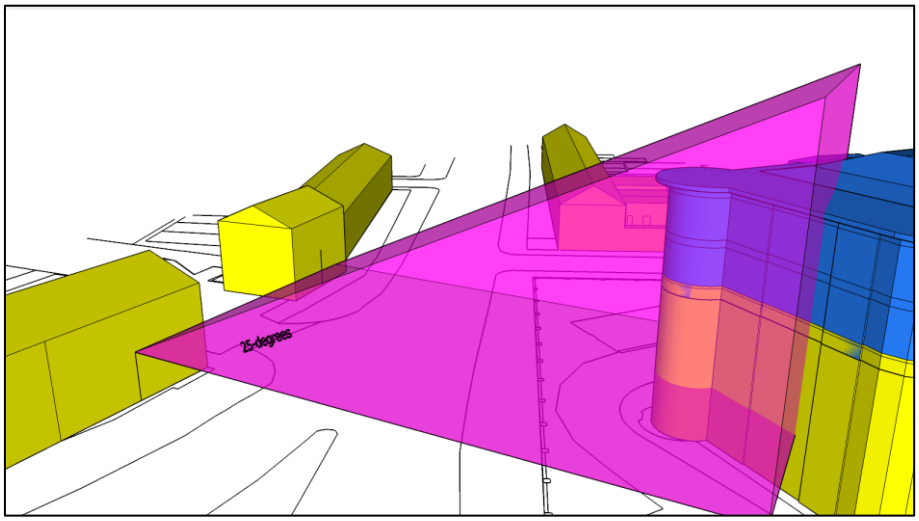

Figure 20: 3D Model – 25-degree line

6.22 Results of Daylight Analysis

6.23 Where the proposed development has been demonstrated to fall beneath a 25° angle taken from the centre of the lowest window at an existing property, then no further assessment is required.

6.24 For the remaining windows, a Vertical Sky Component (VSC) assessment criteria of 27% is usually adopted, however the BRE advises that in certain situations, lower values can be acceptable. For example, if the existing VSC is below 27%, then the target VSC would be not less than 0.8 times its former value.

6.25 The results of the daylight assessment (Appendix 1) indicate that all of the assessed windows would retain a VSC of above 27% or not less than 0.8 times their former value. Thus the reduction in daylight levels to these windows would not be noticeable according to the BRE guidance.

6.26 Thus the impact of the proposed extension on neighbouring daylight levels would be considered to be acceptable according to the BRE guidance.

6.27 Results of Sunlight Analysis

6.28 Windows W1-W10 face within 90 degrees of due south and are assumed to serve living spaces, therefore annual probable sunlight hours (APSH) analysis has been performed on these windows.

6.29 The guideline criteria for assessing annual sunlight at a reference point (centre of window) of the main living room of an existing building is that it should receive 25% of APSH including at least 5% of APSH in winter, or not less than 0.8 times its former value.

6.30 The results of the sunlight analysis indicate that the assessed windows have been shown to pass both the APSH tests (annual & winter). The results are presented in Appendix 2.

6.31 The analysis shows that more than half the area of the amenity spaces of neighbouring properties would receive at least 2 hours of sunlight on 21st March.

6 Conclusion

6.1 This report has detailed a Daylight & Sunlight Assessment for the proposed extension at Great Brighams Mead, Reading RG1. The proposal entails the erection of a 2-storey rooftop extension comprising 72no. flats.

6.2 The existing building is a 3-storey office building which benefits from permitted development (PD) approval from office to residential.

6.3 The proposed extension has been designed with consideration to the existing neighbouring properties, and as such the roof of the extension will be pitched to minimise impact to the neighbouring habitable windows, and to visually replicate the form of the existing building.

6.4 The results of the daylight assessment indicate that all of the assessed neighbouring windows would meet the BRE guidance. Where windows have not met the 25° test, these have been shown to retain a VSC of 27% or not less than 0.8 times their former level. Thus the reduction in daylight levels to these windows would not be noticeable according to the BRE guidance.

6.5 In terms of Annual Probable Sunlight Hours (APSH), the results of the sunlight analysis indicate that the assessed windows have been shown to pass both the APSH tests (annual & winter).

6.6 The analysis shows that more than half the area of the amenity spaces of neighbouring properties would receive at least 2 hours of sunlight on 21st March.

6.7 The values of daylight levels and annual sunlight hours are thus considered to be acceptable for all surrounding properties, according to the BRE guidance.

7 Appendix 1: VSC Results

Window ID	Address	Existing VSC (%)	Proposed VSC (%)	Ratio	Degree of impact
W1	BRIGHAM MEWS	31.42	28.21	0.90	Negligible
W2	BRIGHAM MEWS	31.44	28.28	0.90	Negligible
W3	1 BRIGHAM ROAD	31.59	28.47	0.90	Negligible
W4	3 BRIGHAM ROAD	32.18	29.42	0.91	Negligible
W5	5 BRIGHAM ROAD	32.47	29.87	0.92	Negligible
W6	7 BRIGHAM ROAD	33.14	30.95	0.93	Negligible
W7	9 BRIGHAM ROAD	33.43	31.44	0.94	Negligible
W8	11 BRIGHAM ROAD	34.09	32.55	0.95	Negligible
W9	REGENTS RIVERSIDE (W)	21.22	19.37	0.91	Negligible
W10	REGENTS RIVERSIDE (E)	21.16	19.18	0.91	Negligible
W11	31 DE MONTFORT ROAD	33.29	30.71	0.92	Negligible
W12	29 DE MONTFORT ROAD	32.89	30.07	0.91	Negligible
W13	27 DE MONTFORT ROAD	32.03	28.73	0.90	Negligible
W14	25 DE MONTFORT ROAD	31.71	28.24	0.89	Negligible
W15	23 DE MONTFORT ROAD	31.14	27.35	0.88	Negligible
W16	21 DE MONTFORT ROAD	30.97	27.09	0.87	Negligible
W17	19 DE MONTFORT ROAD	30.59	26.56	0.87	Negligible
W18	17 DE MONTFORT ROAD	30.11	26.02	0.86	Negligible
W19	15 DE MONTFORT ROAD	29.64	24.98	0.84	Negligible
W20	11 DE MONTFORT ROAD	23.00	19.66	0.85	Negligible
W21	9 DE MONTFORT ROAD	30.32	26.27	0.87	Negligible
W22	7 DE MONTFORT ROAD	30.59	26.58	0.87	Negligible
W23	5 DE MONTFORT ROAD	30.83	26.99	0.88	Negligible
W24	3 DE MONTFORT ROAD	30.86	27.14	0.88	Negligible
W25	1 DE MONTFORT ROAD	30.60	27.22	0.89	Negligible
W26	17 VASTERN ROAD	32.21	29.17	0.91	Negligible
W27	17 VASTERN ROAD	19.60	16.44	0.84	Negligible

8 Appendix 2: APSH Results

Existing:

Win ID	Window Location	Orien-tation	Annual (%)	Summer (%)	Winter (%)	Annual Result	Winter Result
W1	BRIGHAM MEWS	110.52	42.96	27.08	15.88	Pass	Pass
W2	BRIGHAM MEWS	110.52	43.02	27.08	15.94	Pass	Pass
W3	1 BRIGHAM ROAD	110.52	44.69	28.31	16.38	Pass	Pass
W4	3 BRIGHAM ROAD	110.52	45.78	29.27	16.51	Pass	Pass
W5	5 BRIGHAM ROAD	110.52	45.20	29.33	15.87	Pass	Pass
W6	7 BRIGHAM ROAD	110.52	46.55	29.19	17.36	Pass	Pass
W7	9 BRIGHAM ROAD	110.52	46.74	29.38	17.36	Pass	Pass
W8	11 BRIGHAM ROAD	110.52	48.03	29.28	18.75	Pass	Pass
W9	REGENTS RIVERSIDE (W)	206.72	35.56	27.78	7.78	Pass	Pass
W10	REGENTS RIVERSIDE (E)	207.62	41.67	20.36	21.31	Pass	Pass

Proposed:

Win ID	Window Location	Orien-tation	Annual (%)	Summer (%)	Winter (%)	Annual Result	Winter Result
W1	BRIGHAM MEWS	110.52	35.23	23.43	11.81	Pass	Pass
W2	BRIGHAM MEWS	110.52	35.31	23.51	11.81	Pass	Pass
W3	1 BRIGHAM ROAD	110.52	39.07	26.57	12.50	Pass	Pass
W4	3 BRIGHAM ROAD	110.52	39.03	26.53	12.50	Pass	Pass
W5	5 BRIGHAM ROAD	110.52	39.80	28.00	11.81	Pass	Pass
W6	7 BRIGHAM ROAD	110.52	41.42	28.23	13.19	Pass	Pass

W7	9 BRIGHAM ROAD	110.52	41.75	28.55	13.19	Pass	Pass
W8	11 BRIGHAM ROAD	110.52	43.86	29.28	14.58	Pass	Pass
W9	REGENTS RIVERSIDE (W)	206.72	33.30	27.78	5.52	Pass	Pass
W10	REGENTS RIVERSIDE (E)	207.62	39.28	20.36	18.91	Pass	Pass