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engineering sustainable buildings

Technical Report -
Daylighting & Sunlight Analysis
Ref: Z29226

79-85 Hathersage Road, Manchester

For

Lee Architects Ltd.



Energy Council
Viridor House
No.3 Bolholt Terrace
Bury/Gtr Manchester
BL8 1PP
Tel: +44 (0)161-762 1055
Fax: +44 (0)161-761 1094
E-mail: mail@energycouncil.co.uk
Web: www.energycouncil.co.uk

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1.0 Introduction

This report has been prepared to support the submission of a planning application for the new development of 79-85 Hathersage Road, Manchester. The new development is to provide a seven-storey residential accommodation block. We have undertaken an assessment of the potential reduction in daylight / sunlight to the surrounding properties as a result of the new development, as follows:

- Darbishire House
- 60-74 Hathersage Road
- Coniston Hall
- 295 Upper Brook Street

This report and analysis reviews the potential daylight / sunlight issues from the proposed new-build development.

In accordance with good practise and planning policy we have therefore reviewed the following against the BRE's daylighting and sunlighting standards:

- Vertical sky component
- Daylight distribution / no sky line
- Annual probable sunlight hours

Basis of Assessment

It is usual to assess daylight and sunlight in relation to the guidelines set out in the 2011 Building Research Establishment (BRE) Report 'Site layout planning for daylight and sunlight - A guide to good practice' by Paul Littlefair.

The BRE guidelines provide two principal measures of daylight for assessing the impact of a proposal on neighbouring properties – namely Vertical Sky Component (VSC), and No-Sky Line (NSL). These measures of daylight are discussed in the following report below.

Vertical Sky Component (VSC) - VSC is a measure of the skylight reaching a point from an overcast sky. For existing buildings, the BRE guideline is based on the loss of VSC at a point at the centre of a window, on the outer plane of the wall. The BRE guidelines state that if the VSC at the centre of a window is less than 27%, and it is less than 0.8 times its former value, then the diffuse daylighting of the existing building may be adversely affected.

No-Sky Line (NSL) - No-Sky Line (NSL) is a measure of the distribution of daylight within a room. As it maps out the region within a room where light can penetrate directly from the sky, it therefore accounts for the size of and number of windows by simple geometry. The BRE guidelines suggest the area of the working plane within a room that can receive direct skylight should not be reduced to less than 0.8 times its former value.

Sunlight (APSH) - In relation to sunlight, the BRE recommends that the Annual Probable Sunlight Hours (APSH) received at a given window in the proposed case should be at least 25% of the total available including at least 5% in winter (September-March). Where the proposed values fall short of these, and the loss is greater than 4%, then the proposed values should not be less than 0.8 times their previous value in each period.

Generally trees and shrubs have not been included within the analysis, partly because their exact shape is very hard to predict, and partly because the dappled shade of a tree is more pleasant than the deep shadow of a building or wall. Only where there is a dense belt or group of evergreen planting will this be included within and shading modelling.

2.0 Executive Summary

We have reviewed the proposals for the new residential extension against the BRE's criteria. Section 6.0 of our report shows the proposed massing after development. It also shows the labelling of the potentially impacted windows associated with the attached numerical results table.

We have modelled existing building massing provided by the existing buildings on site currently and the proposed design as provided by Lee Architects Ltd. The submitted Site Plan and new building proposals have resulted in difficulties in meeting the BRE criteria for 295 Upper Brook Street. However, there are still very good levels of daylight and sunlight received by the other affected windows (in Darbishire House, Coniston Hall and 60-74 Hathersage Road) pre and post-development.

The analysis shows that for the proposed development:

1. **Impact to the majority of the windows is minimal and fully accords with the BRE VSC criteria, except for the windows to each floor in 295 Upper Brook Street** – the proposed VSC in the majority of cases achieve the minimum level of 27%, however not for the NW-facing windows on the gable end of 295 Upper Brook Street. For the majority of windows the VSC has only marginally reduced, therefore within the minimum requirement of 0.8. However, with 295 Upper Brook Street the VSC has been reduced by over 90%.

2. **All rooms comfortably achieve the BRE's NSL criteria, except for the rooms on each floor in 295 Upper Brook Street. In most cases there is no loss of 'View of the Sky' from the working plane, therefore within acceptable levels, however not for 295 Upper Brook Street** – the View of the Sky provision has not changed as a result of the new development, for all but the 3 rooms in 295 Upper Brook Street where the view of the sky has been significantly reduced.

3. **Impact to the majority of the windows is minimal and fully accords with the BRE APSH criteria** – the proposed APSH in the majority of cases achieves the minimum value of 25%, however we have still assessed the current APSH value against the proposed value. For all windows in all rooms the APSH has only

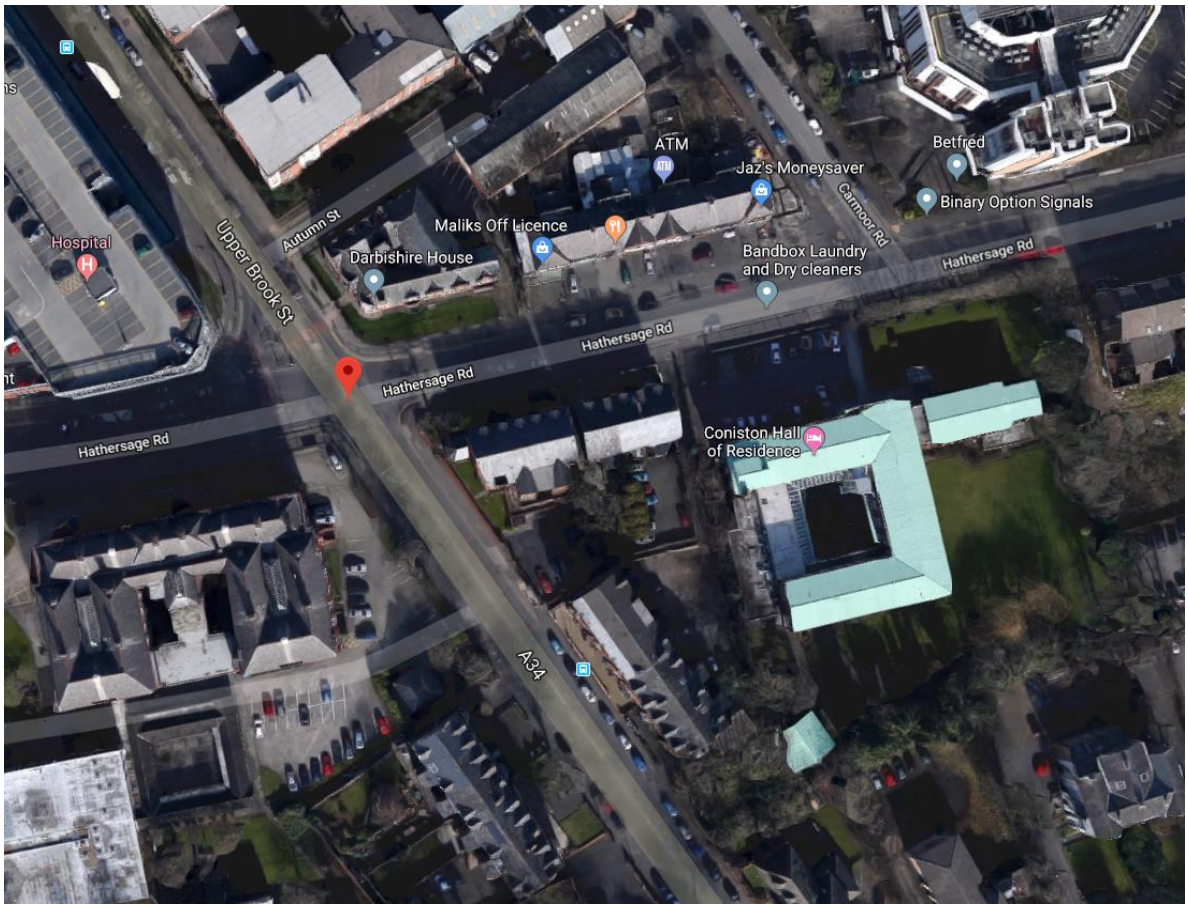
marginally reduced, therefore within the minimum requirement of 0.8. If any windows face an orientation more than 90° of due South they do not need to be assessed.

Conclusion -

We therefore conclude that, in respect of the proposed development, the impact on the daylight/sunlight amenity to the surrounding buildings will not be material, except for 295 Upper Brook Street. There is 1 room at each floor which fails to meet the VSC and View of the Sky criteria. The remainder of the surrounding buildings are compliant with all criteria.

3.0 Existing Site

3.1 The existing site plan of the development plot is shown below:



3.2 Existing Location Plan:



4.0 Proposed Development

4.1 Proposed Block Plan:



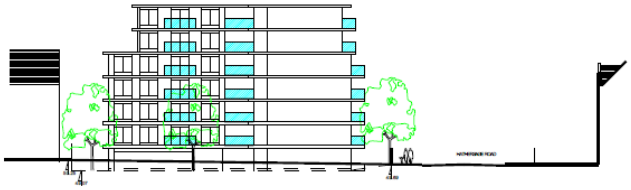
4.2 Proposed Elevations:



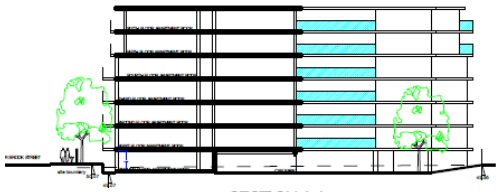
NORTH (HATHERSAGE ROAD) ELEVATION



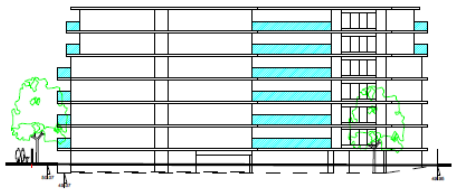
WEST (UPPER BROOK STREET) ELEVATION



EAST ELEVATION



SECTION A-A



SOUTH ELEVATION

5.0 Selection of Photos of the Existing Site

Darbishire House on Hathersage Road (opposite the new development)



60-74 Hathersage Road



Coniston Hall (adjacent to the development on Hathersage Road)

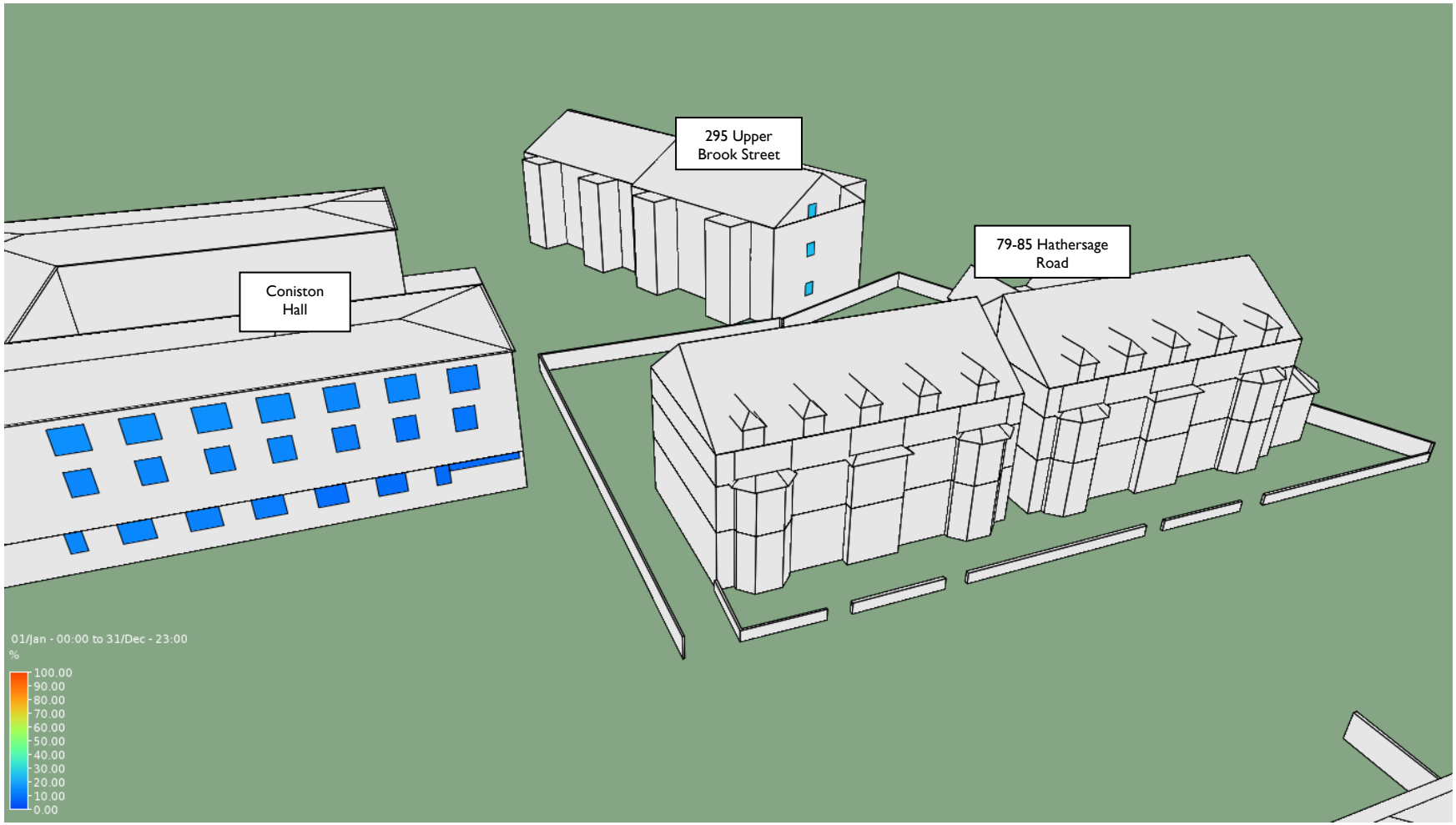


Gable end of 295 Upper Brook Street (facing the new development)

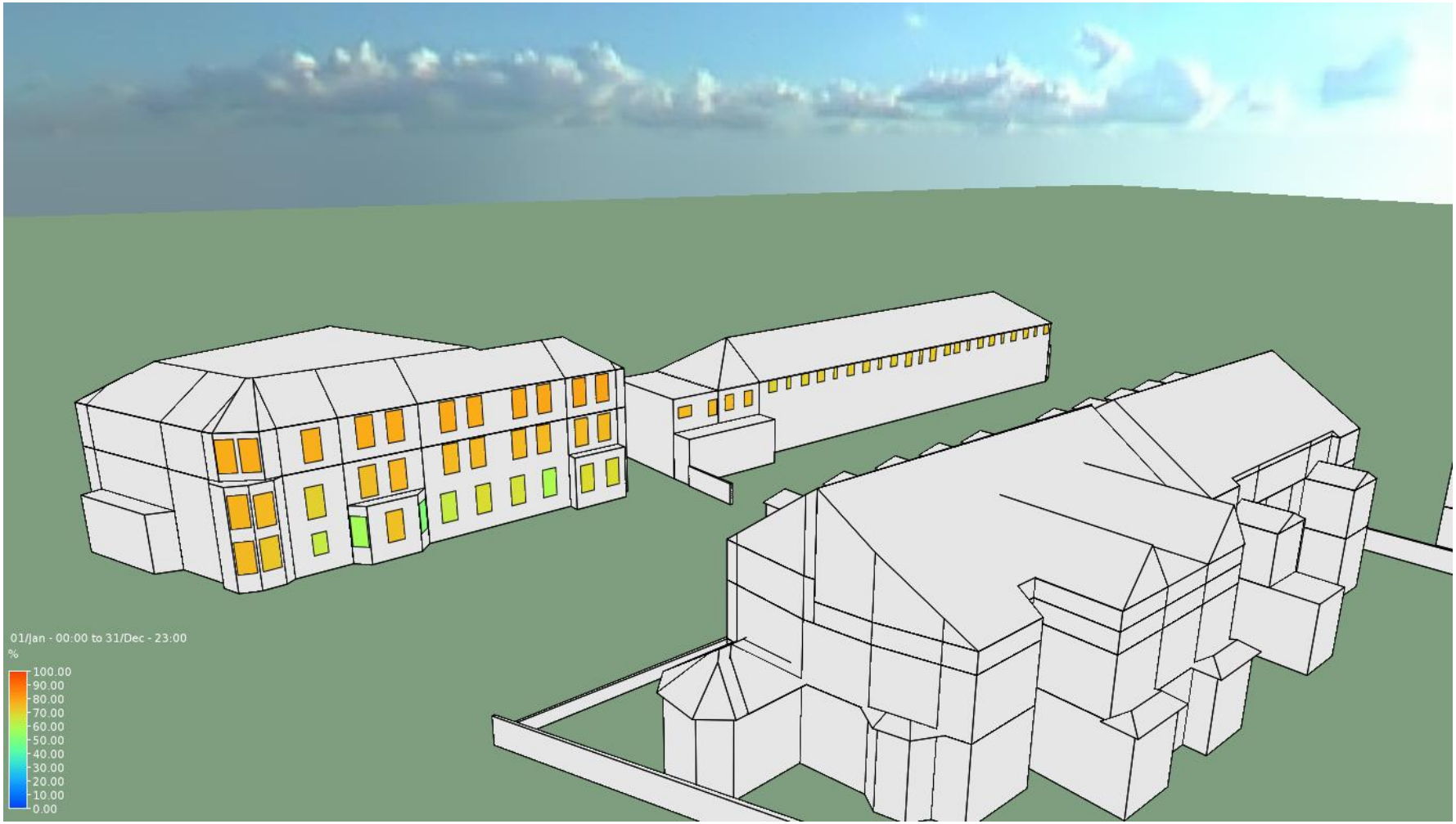


6.0 Daylight and Sunlight Analysis

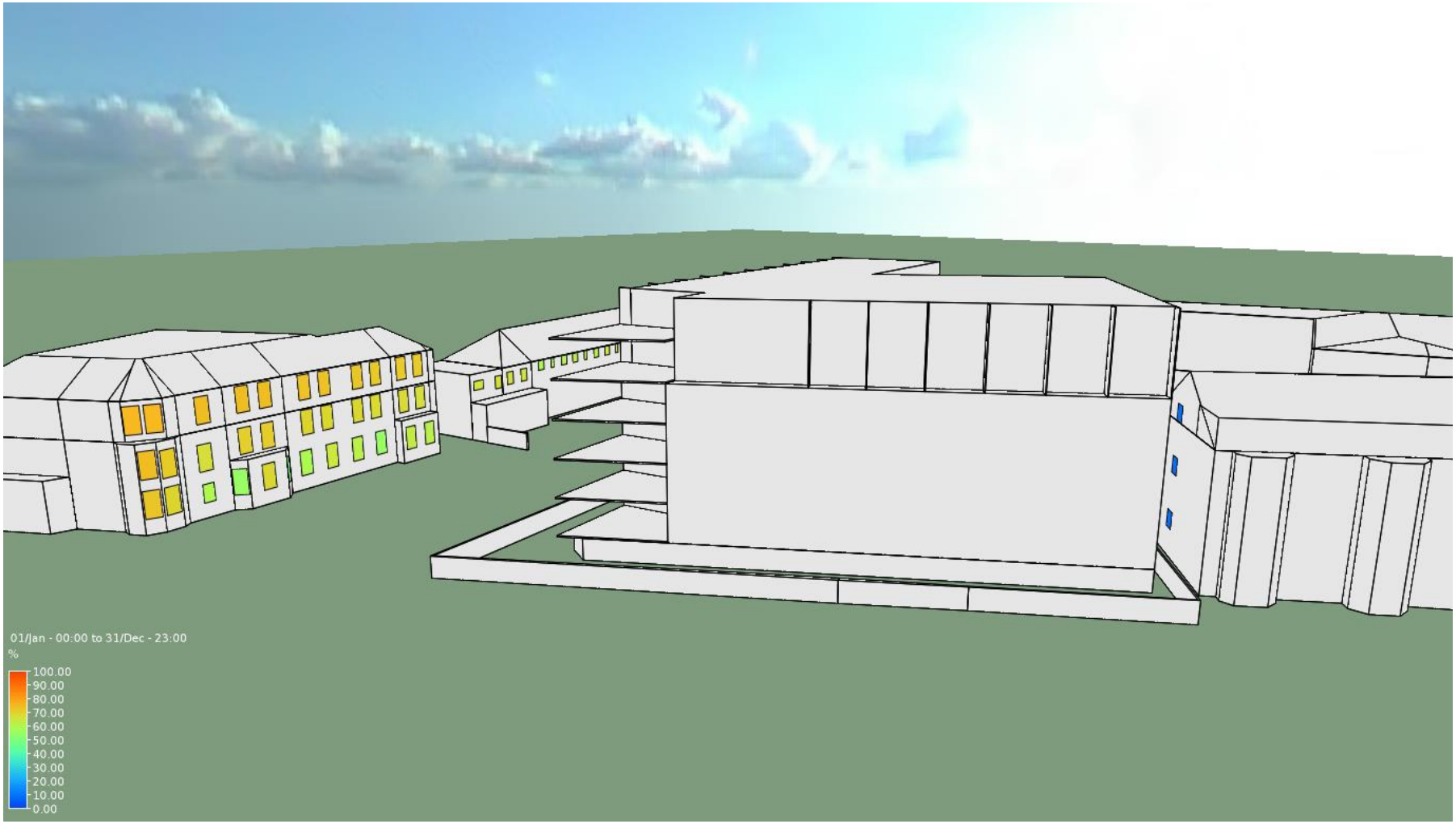
View of the existing site from Hathersage Road, showing the percentage of Annual Probable Sunlight Hours (APSH) for each window:



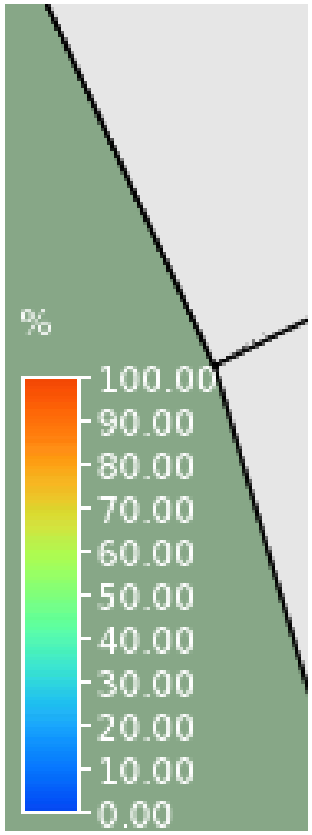
View of Darbishire House and 60-74 Hathersage Road (Existing site in the foreground), showing the percentage of APSH for each window:



View of the proposed building with Darbishire House to the left and 295 Upper Brook Street to the right, showing the percentage of APSH for each window:



The legend in the bottom left corner of the image shows the percentage of Annual Probable Sunlight Hours (APSH) that is received by each window. The warmer the colour, the higher the percentage of APSH.



Results table to confirm compliance

Location			Vertical Sky Component (VSC)						No-Sky Line (NSL)				Window		Annual Probable Sunlight Hours (APSH) (window)					
			EXISTING	PROPOSED	LOSS	%LOSS	Reduction	PASS/	EXISTING	PROPOSED	%Loss	Reduction	Angle from	Aspect	EXISTING		PROPOSED		Reduction	PASS/
Room	Room Use	Window	VSC	VSC	VSC	VSC	Factor	FAIL	% of room	% of room		Factor	North (°)		Winter %	Annual %	Winter %	Annual %	Factor	FAIL
Darbishire House																				
D1/1	GF Living/Bedroom	W1	38.82	38.13	0.69	1.78	0.98	PASS	100.00	100.00	0.00	1.00	164	S/SE		74.00		72.00	0.97	PASS
D1/2	GF Living/Bedroom	W2	36.78	34.49	2.29	6.23	0.94	PASS	100.00	100.00	0.00	1.00	165	S/SE		73.00		69.00	0.95	PASS
D1/3	GF Living/Bedroom	W3	35.85	33.09	2.76	7.70	0.92	PASS	100.00	100.00	0.00	1.00	165	S/SE		66.00		61.00	0.92	PASS
D1/4	GF Living/Bedroom	W4	35.54	31.34	4.20	11.82	0.88	PASS	100.00	100.00	0.00	1.00	165	S/SE		63.00		58.00	0.92	PASS
D1/5	GF Living/Bedroom	W5	35.51	30.98	4.53	12.76	0.87	PASS	100.00	100.00	0.00	1.00	165	S/SE		67.50		62.50	0.93	PASS
D1/6	FF Living/Bedroom	W6	39.09	38.44	0.65	1.66	0.98	PASS	100.00	100.00	0.00	1.00	165	S/SE		76.00		73.00	0.96	PASS
D1/7	FF Living/Bedroom	W7	37.86	35.87	1.99	5.26	0.95	PASS	100.00	100.00	0.00	1.00	165	S/SE		74.50		70.00	0.94	PASS
D1/8	FF Living/Bedroom	W8	37.56	35.06	2.50	6.66	0.93	PASS	100.00	100.00	0.00	1.00	165	S/SE		74.00		69.00	0.93	PASS
D1/9	FF Living/Bedroom	W9	37.07	34.08	2.99	8.07	0.92	PASS	100.00	100.00	0.00	1.00	165	S/SE		74.00		68.00	0.92	PASS
D1/10	FF Living/Bedroom	W10	36.53	33.37	3.16	8.65	0.91	PASS	100.00	100.00	0.00	1.00	165	S/SE		74.00		67.00	0.91	PASS
D1/11	SF Living/Bedroom	W11	39.58	39.05	0.53	1.34	0.99	PASS	100.00	100.00	0.00	1.00	165	S/SE		77.00		75.00	0.97	PASS
D1/12	SF Living/Bedroom	W12	38.98	37.23	1.75	4.49	0.96	PASS	100.00	100.00	0.00	1.00	165	S/SE		77.50		73.00	0.94	PASS
D1/13	SF Living/Bedroom	W13	38.72	36.46	2.26	5.84	0.94	PASS	100.00	100.00	0.00	1.00	165	S/SE		78.00		72.00	0.92	PASS
D1/14	SF Living/Bedroom	W14	38.23	35.71	2.52	6.59	0.93	PASS	100.00	100.00	0.00	1.00	165	S/SE		78.00		71.50	0.92	PASS
D1/15	SF Living/Bedroom	W15	38.14	35.26	2.88	7.55	0.92	PASS	100.00	100.00	0.00	1.00	165	S/SE		78.00		71.00	0.91	PASS
74 Hathersage Road																				
74/1	FF Office	W16	35.84	32.03	3.81	10.63	0.89	PASS	100.00	100.00	0.00	1.00	165	S/SE		69.00		65.50	0.95	PASS
74/2	FF Office	W17	35.60	32.11	3.49	9.80	0.90	PASS	100.00	100.00	0.00	1.00	165	S/SE		70.00		65.50	0.94	PASS
72 Hathersage Road																				
72/1	FF Living/Bedroom	W18	36.16	32.74	3.42	9.46	0.91	PASS	100.00	100.00	0.00	1.00	165	S/SE		70.00		60.00	0.86	PASS
72/2	FF Living/Bedroom	W19	36.48	32.83	3.65	10.01	0.90	PASS	100.00	100.00	0.00	1.00	165	S/SE		70.00		60.00	0.86	PASS
70 Hathersage Road																				
70/1	FF Living/Bedroom	W20	36.47	33.19	3.28	8.99	0.91	PASS	100.00	100.00	0.00	1.00	165	S/SE		70.00		61.00	0.87	PASS
70/2	FF Living/Bedroom	W21	36.31	34.16	2.15	5.92	0.94	PASS	100.00	100.00	0.00	1.00	165	S/SE		70.00		61.50	0.88	PASS
68 Hathersage Road																				
68/1	FF Living/Bedroom	W22	36.80	34.22	2.58	7.01	0.93	PASS	100.00	100.00	0.00	1.00	165	S/SE		71.00		62.00	0.87	PASS
68/2	FF Living/Bedroom	W23	37.02	34.63	2.39	6.46	0.94	PASS	100.00	100.00	0.00	1.00	165	S/SE		71.00		62.00	0.87	PASS
66 Hathersage Road																				
66/1	FF Living/Bedroom	W24	37.18	35.13	2.05	5.51	0.94	PASS	100.00	100.00	0.00	1.00	165	S/SE		71.00		63.00	0.89	PASS
66/2	FF Living/Bedroom	W25	37.18	35.56	1.62	4.36	0.96	PASS	100.00	100.00	0.00	1.00	165	S/SE		71.00		64.00	0.90	PASS
64 Hathersage Road																				
64/1	FF Living/Bedroom	W26	36.99	35.60	1.39	3.76	0.96	PASS	100.00	100.00	0.00	1.00	165	S/SE		71.00		65.00	0.92	PASS
64/2	FF Living/Bedroom	W27	37.52	35.83	1.69	4.50	0.95	PASS	100.00	100.00	0.00	1.00	165	S/SE		71.00		65.00	0.92	PASS
62 Hathersage Road																				
62/1	FF Living/Bedroom	W28	37.31	35.95	1.36	3.65	0.96	PASS	100.00	100.00	0.00	1.00	165	S/SE		71.00		66.00	0.93	PASS
62/2	FF Living/Bedroom	W29	37.48	36.49	0.99	2.64	0.97	PASS	100.00	100.00	0.00	1.00	165	S/SE		71.00		66.00	0.93	PASS
60 Hathersage Road																				
60/1	FF Living/Bedroom	W30	37.39	36.44	0.95	2.54	0.97	PASS	100.00	100.00	0.00	1.00	165	S/SE		72.00		68.00	0.94	PASS
60/2	FF Living/Bedroom	W31	37.32	36.80	0.52	1.39	0.99	PASS	100.00	100.00	0.00	1.00	165	S/SE		73.00		68.00	0.93	PASS

Location			Vertical Sky Component (VSC)						No-Sky Line (NSL)				Window		Annual Probable Sunlight Hours (APSH) (window)					
Room	Room Use	Window	EXISTING VSC	PROPOSED VSC	LOSS VSC	%LOSS VSC	Reduction Factor	PASS/ FAIL	EXISTING % of room	PROPOSED % of room	%Loss	Reduction Factor	Angle from North (°)	Aspect	EXISTING Winter %	EXISTING Annual %	PROPOSED Winter %	PROPOSED Annual %	Reduction Factor	PASS/ FAIL
Coniston Hall																				
C/1	GF Bedroom	W32	36.03	34.61	1.42	3.94	0.96	PASS	100.00	100.00	0.00	1.00	345	N/NW	Not Applicable due to orientation of the window.					
C/2	GF Bedroom	W33	36.85	35.99	0.86	2.33	0.98	PASS	100.00	100.00	0.00	1.00	345	N/NW						
C/3	GF Bedroom	W34	37.27	36.75	0.52	1.40	0.99	PASS	100.00	100.00	0.00	1.00	345	N/NW						
C/4	FF Bedroom	W35	36.66	34.84	1.82	4.96	0.95	PASS	100.00	100.00	0.00	1.00	345	N/NW						
C/5	FF Bedroom	W36	37.65	36.01	1.64	4.36	0.96	PASS	100.00	100.00	0.00	1.00	345	N/NW						
C/6	FF Bedroom	W37	38.05	37.19	0.86	2.26	0.98	PASS	100.00	100.00	0.00	1.00	345	N/NW						
C/7	FF Bedroom	W38	38.54	37.92	0.62	1.61	0.98	PASS	100.00	100.00	0.00	1.00	345	N/NW						
C/8	SF Bedroom	W39	38.20	35.91	2.29	5.99	0.94	PASS	100.00	100.00	0.00	1.00	345	N/NW						
C/9	SF Bedroom	W40	38.60	37.28	1.32	3.42	0.97	PASS	100.00	100.00	0.00	1.00	345	N/NW						
C/10	SF Bedroom	W41	38.85	38.06	0.79	2.03	0.98	PASS	100.00	100.00	0.00	1.00	345	N/NW						
C/11	SF Bedroom	W42	39.12	38.26	0.86	2.20	0.98	PASS	100.00	100.00	0.00	1.00	345	N/NW						
295 Upper Brook Street																				
295/1	GF Bedroom	W43	33.37	1.46	31.91	95.62	0.04	FAIL	100.00	1.00	99.00	0.01	325	NW	Not Applicable due to orientation of the window.					
295/2	FF Bedroom	W44	36.54	1.64	34.90	95.51	0.04	FAIL	100.00	3.00	97.00	0.03	325	NW						
295/3	FF Bedroom	W45	38.49	3.04	35.45	92.10	0.08	FAIL	100.00	12.00	88.00	0.12	325	NW						