BUILDING
RELATIONSHIPS.

Daylight and Sunlight Amenity Study

Redevelopment of
294-295 High Holborn
London
WC1V 7JG

Version

02

Report Date

21 March 2017

Watts.

Project Preface

Client Names and Addresses

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Watts Details

Supervising Director	Robert Hillman
Prepared at	Watts Group PLC 25 Marsh Street Bristol BS1 4AQ
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Job reference	125123
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Executive Summary

We have assessed the impact of the proposed development upon the daylight and sunlight currently enjoyed by the habitable rooms within the neighbouring properties, in accordance with the requirements of the London Borough of Camden. We have also assessed the potential daylight and sunlight amenity to the proposed habitable rooms within the development.

All of the existing residential properties surrounding the development are too remote to experience any noticeable changes in natural light and have not been assessed.

The results from the analysis of the proposed habitable rooms confirm that, whilst not strictly meeting the target values set out by the BRE, all of the rooms will continue to enjoy satisfactory levels of daylight and sunlight, in keeping with the spirit of the London Borough of Camden planning policy.

We therefore do not see any reason why planning permission for the development should be withheld on daylight & sunlight amenity grounds.

Table of Contents

1. Introduction

1.1 Instructions

Harry Manley of DP9 instructed Watts to undertake a daylight & sunlight amenity study of the surrounding properties to the proposed redevelopment of 294-295 High Holborn on 15 November 2016.

1.2 Brief

In conjunction with, and as part of, the application for planning permission for the development, we are required to:

1) study the architect's drawings for the proposed development and other relevant documentation;

2) inspect the development site and the adjoining properties externally, and if possible, internally;

3) conduct an appropriate technical assessment of the impact that the proposed development will have on surrounding properties and an internal study of the available light to the proposed habitable rooms within the scheme;

4) consider the relevant published planning policy statements and associated guidance documents; and

5) prepare a daylight and sunlight amenity study reporting our findings and the results of our technical assessment.

1.3 Site Inspection

An inspection of the development site was undertaken on 17 November 2016 where we were able to view the neighbouring properties externally only. No access was sought to any of the neighbouring properties. The inspection was carried out by Richard Howard of Watts Group Limited.

1.4 Documents Received and Information Utilized for the Analysis

The analysis carried out has been based on a 3D AutoCAD model of the development site and the relevant surrounding buildings. The model has been created using Point Cloud data, obtained by laser survey. Into the model we incorporated the latest proposals for the scheme, supplied by the project architects on 22 November 2016.

As part of the process, we undertook online searches of the relevant neighbouring properties to ascertain which properties were registered as paying Council Tax (and therefore in residential use) and, where necessary, to obtain internal layouts for inclusion within the 3D model. Our searches indicated that no properties within the vicinity of the proposed development are registered as paying Council Tax.

We have therefore not carried out a technical study of the surrounding properties.

1.5 Terminology

The expressions "neighbouring property", "adjoining property" and "surrounding property" are used interchangeably in this report and are not intended to denote any significant or material difference between one property and another.

2. Planning Policy Statements and Guidelines

2.1 Policy Statements

The local authority relevant to this planning application is London Borough of Camden. Their document: "CPG6 – Amenity", published in 2011 to support the Local Development Framework policies and replace Camden Planning Guidance 2006t relates to:

- Camden Core Strategy policy CS5 - Managing the Impact of Growth and Development;
- Core Strategy policy CS14 - Promoting high quality places and conserving our heritage; and
- Policy DP26 – Managing the impact of development on occupiers and neighbours of the Camden Development Policies. DP26 sets out how the Council will protect the quality of life of building occupiers and neighbours by only granting permission for development that does not cause harm to amenity.

In relation to Daylight and Sunlight, CPG6 recommends that all buildings receive adequate daylight and sunlight, that a report will be required where there is the potential to reduce existing levels of daylight and sunlight and that the London Borough of Camden will base their considerations on Average Daylight Factor (ADF) and Vertical Sky Component (VSC) calculations.

The document a makes mention of additional method of analysis: "*Other methods can be used to measure daylight and these can be incorporated in daylight and sunlight reports, where necessary, as a supplement to VSC and ADF measurements, such as the No Sky Line (NSL) test contained within BRE guidance.*"

CPG6 further states that "*…we strongly support the aims of the BRE methodology for assessing sunlight and daylight we will view the results flexibly and where appropriate we may accept alternative targets to address any special circumstances of a site. For example, to enable new development to respect the existing layout and form in some historic areas. This flexible approach is at the Council's discretion and any exception from the targets will assessed on a case by case basis.*"

We have therefore sought to assess the potential impact of the proposed development, as well at the potential for amenity with the proposed habitable rooms in a practical manner, in keeping with both London Borough of Camden planning policy and the BRE guidance, explained below.

3. Guidelines for the Assessment

3.1 General Approach

BRE Report 209, "Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice" provides guidance to designers, clients, consultants and planning officials on laying out proposed development sites to minimise impact on surrounding buildings and open spaces. This document is widely used in the construction industry and we have undertaken many studies on this basis for a variety of local planning authorities.

The BRE report states that living rooms, dining rooms and kitchens within dwellings should be assessed. Bedrooms should also be checked although it is acknowledged that they are less important. Non-domestic buildings where the occupants have a reasonable expectation of daylight should also be considered, although these are usually less sensitive than dwellings. Also, garages, hallways, storage, circulation areas and bathrooms "need not be assessed".

The BRE guide sets out criteria against which an assessment may be made of the levels of daylight / sunlight and the impact that development may cause. The advice given in the BRE report is not mandatory. Specifically, in the introduction to the report, it states that:

> *"The guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory and the guide should not be seen as an instrument of planning policy; its 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.*

3.2 Preliminary Test

The BRE report contains a preliminary test to find out whether an existing building within a reasonable distance should continue to receive enough skylight following the construction of a proposed development:

> *"draw a section in plane perpendicular to each affected main window wall of the existing building. Measure the angle to the horizontal subtended by the new development at the same level of the centre of the lowest window. If this angle is less than 25 degrees for the whole of the development then it is unlikely to have a substantial effect on the diffuse skylight enjoyed by the existing building. If for any part of the new development, this angle is more than 25 degrees, a more detailed check is needed to find the loss of skylight to the existing building."*

As mentioned above, all existing surrounding residential properties are too remote from the proposed development to infringe the Preliminary Test, and therefore should not experience any adverse effects as a results of the proposals.

3.3 Vertical Sky Component (VSC)

The VSC is a measure of the amount of light falling on a window and it is quantified as a ratio of the direct sky illuminance falling on the surface at a specific reference point against the horizontal illuminance under an unobstructed sky. The maximum possible ratio is just under 40% for a completely unobstructed vertical wall. The VSC values attained by windows of a building will not vary with the compass orientation of that building, therefore orientation does not give an appreciation of the interior daylighting.

The target value recommended is 27% but this is not to be strictly applied. This is because if the VSC for a window is less than 27% and is less than 0.8 times its former value, then the BRE numerical guidelines will not be satisfied.

Alternatively, if the Vertical Sky Component is less than 27%, but more than 0.8 times its former value then daylight levels might still be adequate to the neighbouring property. We find it useful to consider the Reduction Factor of 0.8 as a percentage, in other words 80% or put another way, a 20% reduction is recommended as the guideline figure within the BRE report.

It is notoriously difficult to achieve a level of 27% and it is notable that the diagrams in the BRE report show low rise suburban examples rather than a dense urban environment such as this. Therefore the degree of flexibility mentioned within the report should certainly be exercised in this instance as recommended in the guidelines.

3.4 Average Daylight Factor (ADF)

These are defined in BS8206 - Lighting for buildings: Part 2: 2008 as:

> *"The ratio of total daylight flux incident on the working plane to the area on the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to the unobstructed CIE Standard Overcast Sky."*

The ADF is a more complicated calculation than the Vertical Sky Component (VSC). The ADF calculation measures the distribution and quality of light within a room served by a window and takes account of the VSC, the size of the room, the size and number of windows, surface finishes, glazing qualities and room use. If a room is served by more than one window, the total ADF for that room will be based on the aggregate amount of natural light entering by all of the room windows together.

Even where a predominantly daylit appearance is required in dwellings the following ADF values should be considered the minimum:

- 2% for kitchens;
- 1.5% for living rooms;
- 1% for bedrooms.

3.5 Daylight Distribution (DD)/No Sky Line Test

The no-sky line divides those areas of the working plane in a room (normally about 850mm above floor level), which can receive direct sunlight, from those, which cannot. It is important because it provides an indication of how good the distribution of daylight is in a room. Areas beyond the no-sky line in a room will generally look gloomy.

The BRE report recommends that for a room to receive adequate daylight distribution, 80% of the working plane should have a view of the sky. In dense urban environments, it is generally accepted that this is difficult to achieve and a flexible approach should be adopted.

3.6 Sunlight

With regard to assessing sunlight, the BRE report gives recommendations for the assessment of the effect on sunlight enjoyed by individual windows. When considering sunlight, in the northern hemisphere, it is only those windows that face within 90 degrees of due south that will enjoy significant amounts of sunlight and the BRE Report limits the extent of assessments required to only these windows. Sunlight amenity is measured in terms of Annual Probable Sunlight Hours (APSH).

The assessment analyses a point in each window which receives at least a quarter of annual probable sunlight hours (represented as 25% in the results tables), including at least 5% of annual probable sunlight hours during the winter months, between 21 September and 21 March. Again, a Reduction Factor of 0.8 is also applied to the results.

4. Analysis

4.1 Daylight

The results of our study are included within Appendix 2 of this report.

4.1.1 ADF Results

Our study shows that of the 28 rooms assessed, 25 will meet the target values set out by the BRE. The three rooms that fall below the target values (Room 5 & 6 at third floor level, and Room 5 fifth floor level) all serve bedrooms.

With the proposed development in place, the three bedrooms will enjoy ADF levels of 0.9%, 0.88% & 0.87% respectively. Whilst falling below the 1.0% BRE guidance, the levels of ADF are adequate to provide sufficient daylight amenity in an urban environment such as this.

Furthermore, it is clear that the scheme has been designed to provide maximum daylight amenity to the areas within each flat with the greatest expectation of daylight and as such, we believe the light levels within the proposed development to be acceptable.

4.1.2 DD Results

Our assessment of the daylight distribution with the ten proposed living/kitchen/dining areas show that all except two of the rooms will experience daylight distribution levels greater than the 80% target value set out in the BRE guide. The two rooms that fall marginally below guidance (Room 2 at third floor and Room 2 at fourth floor level) will enjoy DD levels of 73% and 79% respectively. In our opinion, these levels of DD, in a dense urban environment such as this are more than sufficient to provide adequate daylight access.

4.1.3 Sunlight Results

All of the windows within the proposed development face that have an adequate expectation of daylight will meet the requirements set out in the BRE guide. The remaining windows face within 90º of due north and therefore do not require assessment.

5. Conclusions & Other Considerations

The findings set out in this report should be set against the following considerations relating to their interpretation and significance.

5.1 Planning Guidance

Our review has followed the guidelines contained within the BRE Report 209, "Site Layout Planning for Daylight and Sunlight – A Guide to Good Practice". We have also reviewed London Borough of Camden's planning policy and made references where necessary.

It should be noted that we are not planning consultants and have not concerned ourselves with any of the other policy considerations or factors that might be relevant to the proposed development. Nevertheless, our report should be seen in context with the various other planning policy requirements.

5.2 Daylight and Sunlight Results

5.2.1 ADF Results

A total of 28 rooms within the proposed development have been included within the analysis and all but 4 meet the recommended guideline level. All three of the rooms are all bedrooms and will enjoy ADF levels of 0.9%, 0.88% & 0.87% respectively. As stated in the BRE, bedrooms have a lesser expectation of daylight. We believe that ADF levels of this nature, within a city centre development, will provide adequate levels of amenity and should not be a reason to refuse planning permission.

5.2.2 DD Results

We have assessed 10 Living/kitchen/dining areas and all except two meet the 80% lit area target value. Both rooms will experience areas adequate distribution of 73% and 79% - more than adequate to provide good daylight amenity when considered in conjunction with the ADF values.

5.2.3 Sunlight Results

With regard to the sunlight results, these were satisfactory in every instance.

5.3 Areas of Further Consideration

We have highlighted that it is necessary to appreciate that the author of the BRE report does not intend the document to be used as an instrument of planning policy.

The author of the Report states in the introduction:

> *"The guide is intended for building designers and their clients, consultants and planning officials. The advice given is not mandatory and the guide should not be seen as an instrument of planning policy; its 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."*

Given the context of the location we believe the results merit being interpreted with an additional level of flexibility.

Appendix 1

General Context Drawings of the Site – as existing and proposed

NOTES:
No dimensions are to be scaled from this drawing. All dimensions are to be checked on site, where discrepancy occurs between specification and drawings the supervising officer must be notified.

Analysis

Produced using Waldram Tools
MBS Survey Software Ltd (www.surveymbs.com)

Existing Model & Surrounding Model

Models derived from 3d terrestrial laser scan survey pointcloud.

Supplemented with site photography, Bing maps and Google Streetmaps.

Proposed Model

151-10-Proposed-10-03-2017.DWG
151-10-Proposed Elevations-10-03-2017.DWG
151-10-Proposed Sections-10-03-2017.DWG

REV:	DATE:	DESCRIPTION:
-	-	-

Watts.

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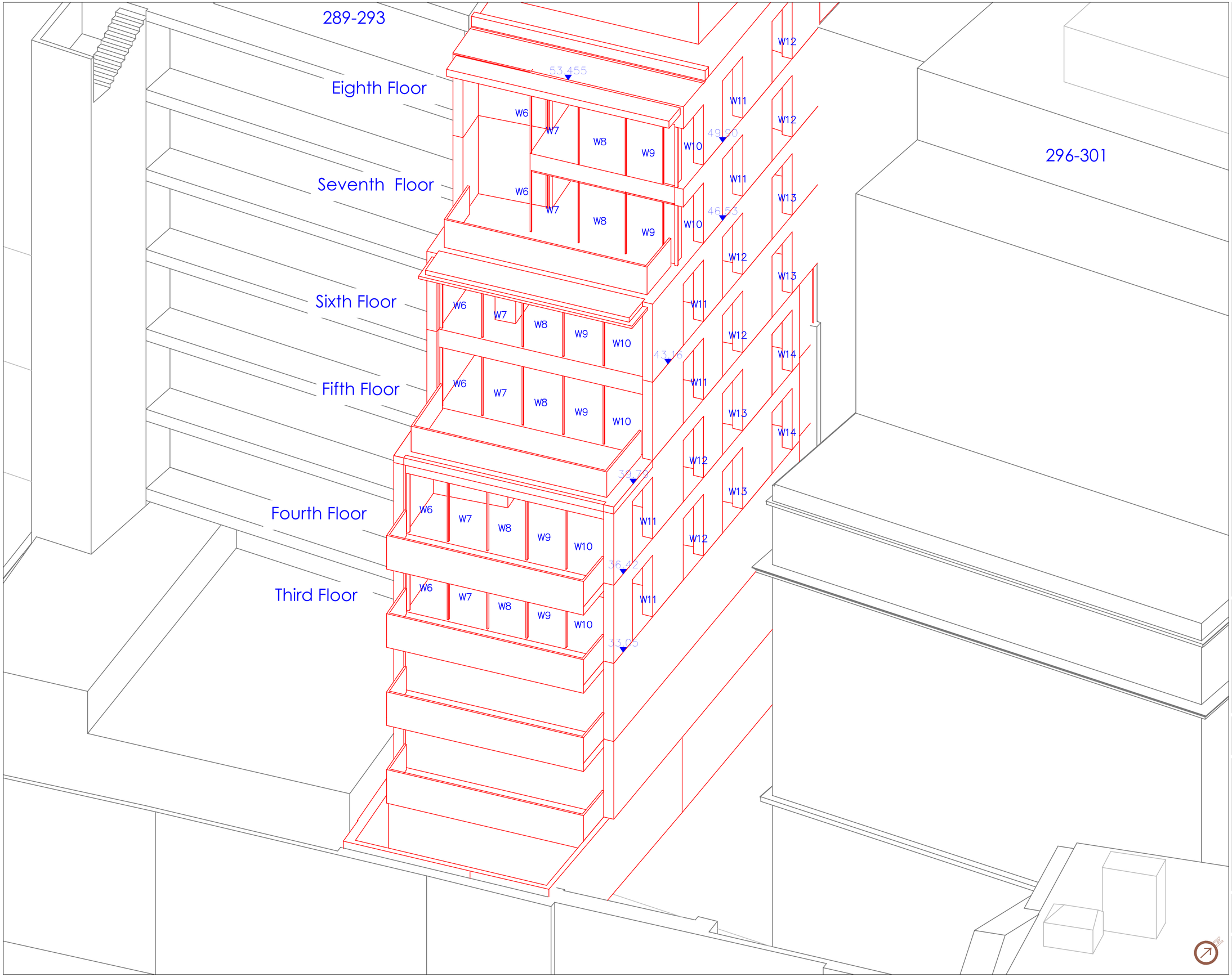
CLIENT:
CHH London Ltd

PROPERTY:
294-295 High Holborn
London

DRAWING TITLE:
Proposed Site Layout

SCALE @ A1:	DATE:	DRAWN:	CHECKED:
NTS	**20.03.17**	JM	CC

DRAWING NUMBER:	REV:
125123-02-01	-



NOTES:
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151-10-Proposed Elevations-10-03-2017.DWG
151-10-Proposed Sections-10-03-2017.DWG

REV:	DATE:	DESCRIPTION:
.	.	.

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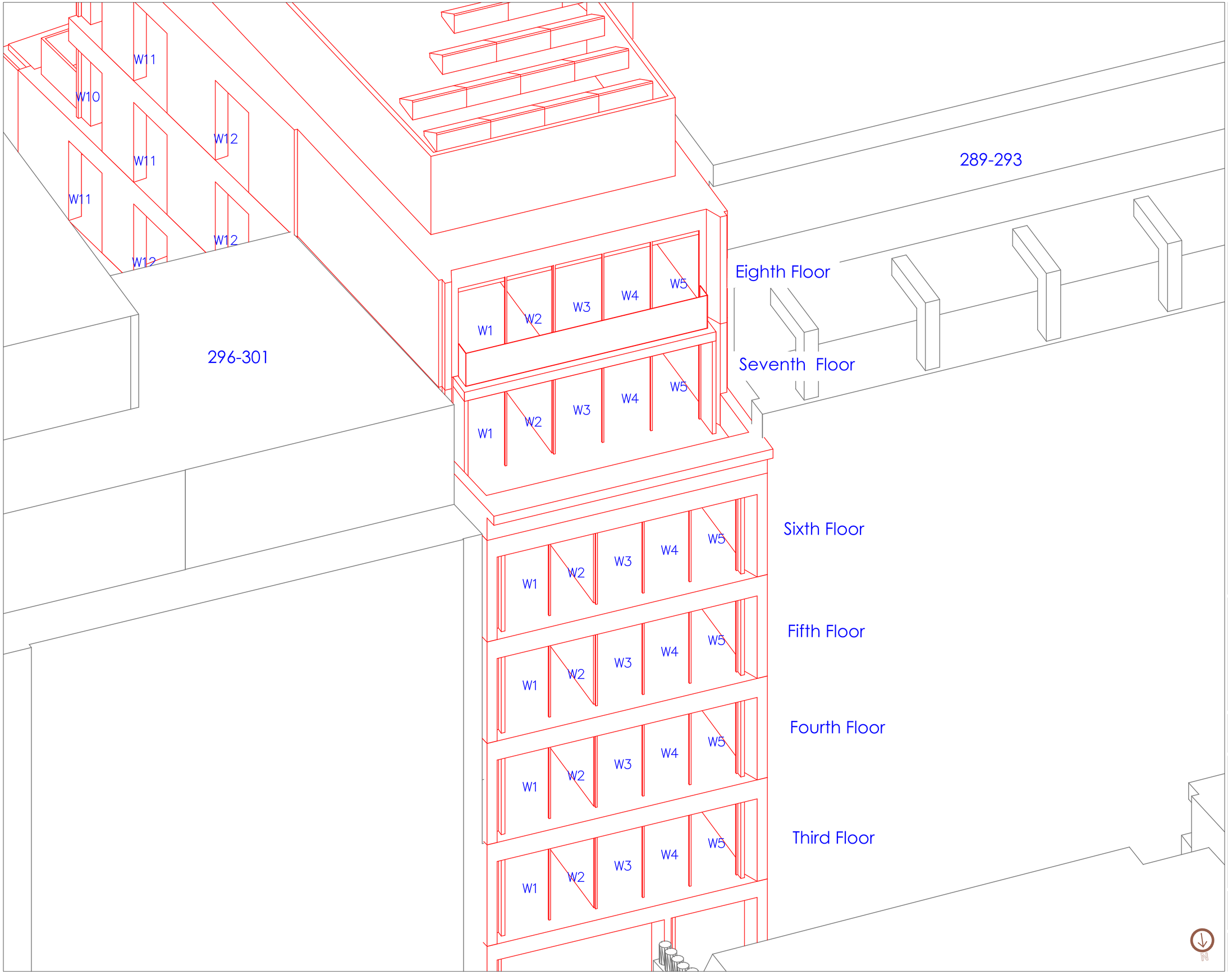
DRAWING TITLE:
Proposed 3D View
Looking North West

SCALE @ A1:	DATE:	DRAWN:	JM
NTS	**20.03.17**	CHECKED:	CC

DRAWING NUMBER:	REV:
125123-02-02	.



NOTES:
No dimensions are to be scaled from this drawing. All dimensions are to be checked on site, where discrepancy occurs between specification and drawings the supervising officer must be notified.

Analysis

Produced using Waldram Tools
MBS Survey Software Ltd (www.surveymbs.com)

Existing Model & Surrounding Model

Models derived from 3d terrestrial laser scan survey pointcloud.

Supplemented with site photography, Bing maps and Google Streetmaps.

Proposed Model

151-10-Proposed-10-03-2017.DWG
151-10-Proposed Elevations-10-03-2017.DWG
151-10-Proposed Sections-10-03-2017.DWG

REV:	DATE:	DESCRIPTION:
.	.	.

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DRAWING TITLE:
Proposed 3D View
Looking South

SCALE @ A1:	DATE:	DRAWN:	JM
NTS	**20.03.17**	CHECKED:	CC

DRAWING NUMBER:	REV:
125123-02-03	.

Appendix 2

Daylight and Sunlight Results

Project Name: 294-295 High Holborn
Project No.: 125123-02
Report Title: Internal Daylight Assessment -Average Daylight Factor
Date: 20/03/2017

Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	Glass Transmittance	Glazed Area	Clear Sky Angle Proposed	Room Surface Area	Average Surface Reflectance	Below Working Plane Factor	ADF Proposed	Req'd Value	Meets BRE Criteria
294-295 High Holborn													
Third	R1	Residential	Bedroom	W1-L	0.68	0.91	52.80	108.63	0.50	0.15	0.06		
				W1-U	0.68	2.02	46.43	108.63	0.50	1.00	0.78		
				W2-L	0.68	0.90	54.24	108.63	0.50	0.15	0.06		
				W2-U	0.68	2.01	46.95	108.63	0.50	1.00	0.79		
											1.69	1.00	YES
Third	R2	Residential	LD	W3-L	0.68	0.91	54.10	126.77	0.50	0.15	0.05		
				W3-U	0.68	2.03	46.65	126.77	0.50	1.00	0.68		
				W4-L	0.68	0.91	53.48	126.77	0.50	0.15	0.05		
				W4-U	0.68	2.02	46.15	126.77	0.50	1.00	0.67		
				W5-L	0.68	0.91	51.76	126.77	0.50	0.15	0.05		
				W5-U	0.68	2.02	45.31	126.77	0.50	1.00	0.65		
											2.15	1.50	YES
Third	R3	Residential	LD	W6-L	0.68	1.03	49.41	143.56	0.50	0.15	0.05		
				W6-U	0.68	2.12	50.61	143.56	0.50	1.00	0.68		
				W7-L	0.68	1.03	52.03	143.56	0.50	0.15	0.05		
				W7-U	0.68	2.12	45.33	143.56	0.50	1.00	0.61		
				W8-L	0.68	1.03	51.61	143.56	0.50	0.15	0.05		
				W8-U	0.68	2.12	44.49	143.56	0.50	1.00	0.59		
				W9-L	0.68	1.03	51.95	143.56	0.50	0.15	0.05		
				W9-U	0.68	2.12	45.11	143.56	0.50	1.00	0.60		
				W10-L	0.68	1.03	49.60	143.56	0.50	0.15	0.05		
				W10-U	0.68	2.12	49.83	143.56	0.50	1.00	0.67		
				W11-L	0.68	1.23	51.42	143.56	0.50	0.15	0.06		
				W11-U	0.68	2.60	52.39	143.56	0.50	1.00	0.86		
											4.31	1.50	YES
Third	R4	Residential	Bedroom	W12-L	0.68	1.23	35.07	62.88	0.50	0.15	0.09		
				W12-U	0.68	2.60	36.42	62.88	0.50	1.00	1.36		
											1.46	1.00	YES
Third	R5	Residential	Bedroom	W13-L	0.68	1.22	27.79	80.52	0.50	0.15	0.06		
				W13-U	0.68	2.59	28.83	80.52	0.50	1.00	0.84		
											0.90	1.00	NO
Third	R6	Residential	Bedroom	W14-L	0.68	1.22	20.50	58.84	0.50	0.15	0.06		
				W14-U	0.68	2.59	20.57	58.84	0.50	1.00	0.82		
											0.88	1.00	NO
Fourth	R1	Residential	Bedroom	W1-L	0.68	0.91	58.37	108.63	0.50	0.15	0.07		
				W1-U	0.68	2.02	52.14	108.63	0.50	1.00	0.88		
				W2-L	0.68	0.90	59.91	108.63	0.50	0.15	0.07		
				W2-U	0.68	2.01	52.74	108.63	0.50	1.00	0.89		
											1.90	1.00	YES
Fourth	R2	Residential	LD	W3-L	0.68	0.91	59.76	126.77	0.50	0.15	0.06		
				W3-U	0.68	2.03	52.46	126.77	0.50	1.00	0.76		
				W4-L	0.68	0.91	59.13	126.77	0.50	0.15	0.06		
				W4-U	0.68	2.02	51.98	126.77	0.50	1.00	0.75		
				W5-L	0.68	0.91	57.27	126.77	0.50	0.15	0.06		
				W5-U	0.68	2.02	51.07	126.77	0.50	1.00	0.74		
											2.42	1.50	YES
Fourth	R3	Residential	LD	W6-L	0.68	1.03	62.60	143.56	0.50	0.15	0.06		
				W6-U	0.68	2.12	81.67	143.56	0.50	1.00	1.09		
				W7-L	0.68	1.03	69.55	143.56	0.50	0.15	0.07		
				W7-U	0.68	2.12	83.54	143.56	0.50	1.00	1.12		
				W8-L	0.68	1.03	70.16	143.56	0.50	0.15	0.07		
				W8-U	0.68	2.12	83.63	143.56	0.50	1.00	1.12		
				W9-L	0.68	1.03	69.56	143.56	0.50	0.15	0.07		
				W9-U	0.68	2.12	83.50	143.56	0.50	1.00	1.12		
				W10-L	0.68	1.03	63.06	143.56	0.50	0.15	0.06		
				W10-U	0.68	2.12	81.51	143.56	0.50	1.00	1.09		
				W11-L	0.68	1.23	57.93	143.56	0.50	0.15	0.07		
				W11-U	0.68	2.60	59.46	143.56	0.50	1.00	0.97		
											6.90	1.50	YES
Fourth	R4	Residential	Bedroom	W12-L	0.68	1.23	43.94	62.88	0.50	0.15	0.12		
				W12-U	0.68	2.60	47.26	62.88	0.50	1.00	1.77		
											1.88	1.00	YES
Fourth	R5	Residential	Bedroom	W13-L	0.68	1.22	35.54	80.52	0.50	0.15	0.07		
				W13-U	0.68	2.59	37.92	80.52	0.50	1.00	1.11		
											1.18	1.00	YES
Fourth	R6	Residential	Bedroom	W14-L	0.68	1.22	24.97	58.84	0.50	0.15	0.07		
				W14-U	0.68	2.59	25.63	58.84	0.50	1.00	1.02		
											1.09	1.00	YES
Fifth	R1	Residential	Bedroom	W1-L	0.68	0.91	64.06	89.42	0.50	0.15	0.09		
				W1-U	0.68	2.02	57.47	89.42	0.50	1.00	1.18		
				W2-L	0.68	0.91	65.77	89.42	0.50	0.15	0.09		
				W2-U	0.68	2.02	58.23	89.42	0.50	1.00	1.19		
											2.55	1.00	YES
Fifth	R2	Residential	LKD	W3-L	0.68	0.91	65.65	146.61	0.50	0.15	0.06		
				W3-U	0.68	2.02	58.00	146.61	0.50	1.00	0.72		
				W4-L	0.68	0.91	65.03	146.61	0.50	0.15	0.05		
				W4-U	0.68	2.02	57.58	146.61	0.50	1.00	0.72		

Project Name: 294-295 High Holborn
Project No.: 125123-02
Report Title: Internal Daylight Assessment -Average Daylight Factor
Date: 20/03/2017

Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	Glass Transmittance	Glazed Area	Clear Sky Angle Proposed	Room Surface Area	Average Surface Reflectance	Below Working Plane Factor	ADF Proposed	Req'd Value	Meets BRE Criteria
				W5-L	0.68	0.91	63.02	146.61	0.50	0.15	0.05		
				W5-U	0.68	2.02	56.60	146.61	0.50	1.00	0.71		
											2.32	1.50	YES
Fifth	R3	Residential	LKD	W6-L	0.68	1.06	51.97	150.00	0.50	0.15	0.05		
				W6-U	0.68	2.18	51.96	150.00	0.50	1.00	0.69		
				W7-L	0.68	1.06	56.74	150.00	0.50	0.15	0.05		
				W7-U	0.68	2.18	47.07	150.00	0.50	1.00	0.62		
				W8-L	0.68	1.06	56.66	150.00	0.50	0.15	0.05		
				W8-U	0.68	2.18	46.32	150.00	0.50	1.00	0.61		
				W9-L	0.68	1.06	56.75	150.00	0.50	0.15	0.05		
				W9-U	0.68	2.18	47.00	150.00	0.50	1.00	0.62		
				W10-L	0.68	1.06	52.41	150.00	0.50	0.15	0.05		
				W10-U	0.68	2.18	51.50	150.00	0.50	1.00	0.68		
				W11-L	0.68	1.22	56.34	150.00	0.50	0.15	0.06		
				W11-U	0.68	2.59	57.29	150.00	0.50	1.00	0.90		
											4.44	1.50	YES
Fifth	R4	Residential	Bedroom	W12-L	0.68	1.22	45.36	59.11	0.50	0.15	0.13		
				W12-U	0.68	2.59	46.13	59.11	0.50	1.00	1.83		
											1.96	1.00	YES
Fifth	R5	Residential	Bedroom	W13-L	0.68	1.22	30.62	90.30	0.50	0.15	0.06		
				W13-U	0.68	2.59	31.43	90.30	0.50	1.00	0.82		
											0.87	1.00	NO
Sixth	R1	Residential	Bedroom	W1-L	0.68	0.91	68.88	89.36	0.50	0.15	0.10		
				W1-U	0.68	2.02	62.16	89.36	0.50	1.00	1.27		
				W2-L	0.68	0.91	70.86	89.36	0.50	0.15	0.10		
				W2-U	0.68	2.02	63.18	89.36	0.50	1.00	1.30		
											2.76	1.00	YES
Sixth	R2	Residential	LKD	W3-L	0.68	0.91	70.83	147.55	0.50	0.15	0.06		
				W3-U	0.68	2.02	63.07	147.55	0.50	1.00	0.78		
				W4-L	0.68	0.91	70.31	147.55	0.50	0.15	0.06		
				W4-U	0.68	2.02	62.76	147.55	0.50	1.00	0.78		
				W5-L	0.68	0.91	68.25	147.55	0.50	0.15	0.06		
				W5-U	0.68	2.02	61.76	147.55	0.50	1.00	0.77		
											2.51	1.50	YES
Sixth	R3	Residential	LKD	W6-L	0.68	1.06	52.68	165.34	0.50	0.15	0.05		
				W6-U	0.68	2.18	55.55	165.34	0.50	1.00	0.66		
				W7-L	0.68	1.06	56.53	165.34	0.50	0.15	0.05		
				W7-U	0.68	2.18	53.07	165.34	0.50	1.00	0.63		
				W8-L	0.68	1.06	56.46	165.34	0.50	0.15	0.05		
				W8-U	0.68	2.18	52.65	165.34	0.50	1.00	0.63		
				W9-L	0.68	1.06	56.53	165.34	0.50	0.15	0.05		
				W9-U	0.68	2.18	53.04	165.34	0.50	1.00	0.63		
				W10-L	0.68	1.06	53.02	165.34	0.50	0.15	0.05		
				W10-U	0.68	2.18	55.32	165.34	0.50	1.00	0.66		
				W11-L	0.68	1.22	62.02	165.34	0.50	0.15	0.06		
				W11-U	0.68	2.59	63.54	165.34	0.50	1.00	0.90		
											4.43	1.50	YES
Sixth	R4	Residential	Bedroom	W12-L	0.68	1.22	51.34	60.10	0.50	0.15	0.14		
				W12-U	0.68	2.59	53.52	60.10	0.50	1.00	2.09		
											2.24	1.00	YES
Sixth	R5	Residential	Bedroom	W13-L	0.68	1.22	37.34	90.30	0.50	0.15	0.07		
				W13-U	0.68	2.59	40.23	90.30	0.50	1.00	1.05		
											1.12	1.00	YES
Seventh	R1	Residential	Bedroom	W1-L	0.68	0.94	59.39	76.72	0.50	0.15	0.10		
				W1-U	0.68	2.16	58.69	76.72	0.50	1.00	1.50		
				W2-L	0.68	0.94	66.34	76.72	0.50	0.15	0.11		
				W2-U	0.68	2.16	63.19	76.72	0.50	1.00	1.61		
											3.32	1.00	YES
Seventh	R2	Residential	Bedroom	W3-L	0.68	0.94	67.23	100.59	0.50	0.15	0.09		
				W3-U	0.68	2.16	63.61	100.59	0.50	1.00	1.24		
				W4-L	0.68	0.94	66.05	100.59	0.50	0.15	0.08		
				W4-U	0.68	2.16	63.19	100.59	0.50	1.00	1.23		
				W5-L	0.68	0.94	59.41	100.59	0.50	0.15	0.08		
				W5-U	0.68	2.16	59.82	100.59	0.50	1.00	1.16		
											3.88	1.00	YES
Seventh	R3	Residential	LKD	W6-L	0.68	1.12	27.42	190.45	0.50	0.15	0.02		
				W6-U	0.68	2.31	24.25	190.45	0.50	1.00	0.27		
				W7-L	0.68	1.26	48.07	190.45	0.50	0.15	0.04		
				W7-U	0.68	2.60	44.15	190.45	0.50	1.00	0.55		
				W8-L	0.68	1.25	48.33	190.45	0.50	0.15	0.04		
				W8-U	0.68	2.58	44.56	190.45	0.50	1.00	0.55		
				W9-L	0.68	1.32	46.82	190.45	0.50	0.15	0.04		
				W9-U	0.68	2.71	51.56	190.45	0.50	1.00	0.67		
				W10-L	0.68	1.16	70.28	190.45	0.50	0.15	0.06		
				W10-U	0.68	2.38	70.31	190.45	0.50	1.00	0.80		
				W11-L	0.68	1.22	63.09	190.45	0.50	0.15	0.06		
				W11-U	0.68	2.59	69.04	190.45	0.50	1.00	0.85		
				W12-L	0.68	1.22	51.56	190.45	0.50	0.15	0.05		
				W12-U	0.68	2.59	59.86	190.45	0.50	1.00	0.74		
											4.72	1.50	YES

Project Name: 294-295 High Holborn
Project No.: 125123-02
Report Title: Internal Daylight Assessment -Average Daylight Factor
Date: 20/03/2017

Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	Glass Transmittance	Glazed Area	Clear Sky Angle Proposed	Room Surface Area	Average Surface Reflectance	Below Working Plane Factor	ADF Proposed	Req'd Value	Meets BRE Criteria
Eighth	R1	Residential	Bedroom	W1-L	0.68	0.94	38.06	78.43	0.50	0.15	0.06		
				W1-U	0.68	2.27	81.17	78.43	0.50	1.00	2.13		
				W2-L	0.68	0.94	40.54	78.43	0.50	0.15	0.07		
				W2-U	0.68	2.27	84.52	78.43	0.50	1.00	2.22		
											4.48	1.00	YES
Eighth	R2	Residential	Bedroom	W3-L	0.68	0.94	40.82	102.67	0.50	0.15	0.05		
				W3-U	0.68	2.27	84.76	102.67	0.50	1.00	1.70		
				W4-L	0.68	0.94	40.54	102.67	0.50	0.15	0.05		
				W4-U	0.68	2.27	84.36	102.67	0.50	1.00	1.69		
				W5-L	0.68	0.94	38.06	102.67	0.50	0.15	0.05		
				W5-U	0.68	2.27	81.25	102.67	0.50	1.00	1.63		
											5.17	1.00	YES
Eighth	R3	Residential	LKD	W6-L	0.68	1.12	31.05	193.59	0.50	0.15	0.02		
				W6-U	0.68	2.44	28.44	193.59	0.50	1.00	0.33		
				W7-L	0.68	1.26	61.66	193.59	0.50	0.15	0.05		
				W7-U	0.68	2.75	67.46	193.59	0.50	1.00	0.87		
				W8-L	0.68	1.25	61.56	193.59	0.50	0.15	0.05		
				W8-U	0.68	2.73	67.55	193.59	0.50	1.00	0.86		
				W9-L	0.68	1.32	56.48	193.59	0.50	0.15	0.05		
				W9-U	0.68	2.87	69.49	193.59	0.50	1.00	0.93		
				W10-L	0.68	1.16	78.94	193.59	0.50	0.15	0.06		
				W10-U	0.68	2.38	77.16	193.59	0.50	1.00	0.86		
				W11-L	0.68	1.22	77.43	193.59	0.50	0.15	0.07		
				W11-U	0.68	2.59	78.79	193.59	0.50	1.00	0.96		
				W12-L	0.68	1.22	72.70	193.59	0.50	0.15	0.06		
				W12-U	0.68	2.59	76.07	193.59	0.50	1.00	0.92		
											6.11	1.50	YES

Project Name: 294-295 High Holborn
Project No.: 125123 - 02
Report Title: Internal Daylight Assessment - VSC & APSH Analysis
Date of Analysis: 20/03/2017

Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	VSC	Meets BRE Criteria	Window Orientation	Annual	Meets BRE Criteria	Winter	Meets BRE Criteria	Total Suns per Room Annual	Meets BRE Criteria	Total Suns per Room Winter	Meets BRE Criteria
294-295 High Holborn															
Third	R1	Residential	Bedroom	W1	18.65	NO	350°N		*North*		*North*				
				W2	19.05	NO	350°N		*North*		*North*				
												1	NO	0	NO
	R2	Residential	LD	W3	18.86	NO	350°N		*North*		*North*				
				W4	18.58	NO	350°N		*North*		*North*				
				W5	17.94	NO	350°N		*North*		*North*				
												1	NO	0	NO
	R3	Residential	LD	W6	20.62	NO	162°	34	YES	25	YES				
				W7	17.39	NO	162°	26	YES	23	YES				
				W8	16.86	NO	162°	24	NO	21	YES				
				W9	17.27	NO	162°	24	NO	21	YES				
				W10	20.15	NO	162°	35	YES	21	YES				
				W11	21.10	NO	73°N		*North*		*North*				
												58	NO	26	NO
	R4	Residential	Bedroom	W12	11.53	NO	73°N		*North*		*North*				
												15	NO	4	NO
	R5	Residential	Bedroom	W13	7.81	NO	73°N		*North*		*North*				
												10	NO	2	NO
	R6	Residential	Bedroom	W14	4.48	NO	73°N		*North*		*North*				
													NO	0	NO
Fourth	R1	Residential	Bedroom	W1	22.09	NO	350°N		*North*		*North*				
				W2	22.54	NO	350°N		*North*		*North*				
												3	NO	0	NO
	R2	Residential	LD	W3	22.35	NO	350°N		*North*		*North*				
				W4	22.08	NO	350°N		*North*		*North*				
				W5	21.39	NO	350°N		*North*		*North*				
												3	NO	0	NO
	R3	Residential	LD	W6	36.97	YES	162°	73	YES	26	YES				
				W7	37.66	YES	162°	79	YES	27	YES				
				W8	37.68	YES	162°	79	YES	27	YES				
				W9	37.65	YES	162°	77	YES	27	YES				
				W10	36.90	YES	162°	74	YES	27	YES				
				W11	25.46	NO	73°N		*North*		*North*				
												81	NO	27	NO
	R4	Residential	Bedroom	W12	17.67	NO	73°N		*North*		*North*				
												23	NO	5	NO
	R5	Residential	Bedroom	W13	12.30	NO	73°N		*North*		*North*				
												19	NO	2	NO
	R6	Residential	Bedroom	W14	6.36	NO	73°N		*North*		*North*				
												10	NO	2	NO
Fifth	R1	Residential	Bedroom	W1	25.38	NO	350°N		*North*		*North*				
				W2	25.90	NO	350°N		*North*		*North*				
												3	NO	0	NO
	R2	Residential	LKD	W3	25.74	NO	350°N		*North*		*North*				
				W4	25.50	NO	350°N		*North*		*North*				
				W5	24.78	NO	350°N		*North*		*North*				
												3	NO	0	NO
	R3	Residential	LKD	W6	21.52	NO	162°	34	YES	25	YES				
				W7	18.43	NO	162°	27	YES	24	YES				
				W8	17.96	NO	162°	25	YES	22	YES				
				W9	18.40	NO	162°	26	YES	22	YES				
				W10	21.24	NO	162°	36	YES	22	YES				
				W11	24.18	NO	73°N		*North*		*North*				
												60	NO	27	NO
	R4	Residential	Bedroom	W12	17.16	NO	73°N		*North*		*North*				
												24	NO	5	NO
	R5	Residential	Bedroom	W13	8.92	NO	73°N		*North*		*North*				
												11	NO	3	NO
Sixth	R1	Residential	Bedroom	W1	28.24	YES	350°N		*North*		*North*				
				W2	28.88	YES	350°N		*North*		*North*				
												4	NO	0	NO
	R2	Residential	LKD	W3	28.80	YES	350°N		*North*		*North*				
				W4	28.63	YES	350°N		*North*		*North*				
				W5	27.93	YES	350°N		*North*		*North*				
												4	NO	0	NO
	R3	Residential	LKD	W6	23.85	NO	162°	38	YES	26	YES				
				W7	22.21	NO	162°	34	YES	27	YES				
				W8	21.92	NO	162°	33	YES	25	YES				
				W9	22.18	NO	162°	33	YES	25	YES				
				W10	23.70	NO	162°	39	YES	25	YES				
				W11	27.92	YES	73°N		*North*		*North*				
												59	NO	28	NO
	R4	Residential	Bedroom	W12	21.51	NO	73°N		*North*		*North*				
												24	NO	5	NO
	R5	Residential	Bedroom	W13	13.40	NO	73°N		*North*		*North*				
												16	NO	3	NO
Seventh	R1	Residential	Bedroom	W1	25.92	NO	350°N		*North*		*North*				
				W2	28.78	YES	350°N		*North*		*North*				
												2	NO	0	NO
	R2	Residential	Bedroom	W3	29.05	YES	350°N		*North*		*North*				
				W4	28.76	YES	350°N		*North*		*North*				
				W5	26.51	NO	350°N		*North*		*North*				
												1	NO	0	NO
	R3	Residential	LKD	W6	5.45	NO	249°	10	NO	10	YES				
				W7	16.60	NO	162°	22	NO	20	YES				
				W8	16.84	NO	162°	24	NO	20	YES				
				W9	20.94	NO	162°	38	YES	20	YES				
				W10	31.57	YES	73°N		*North*		*North*				
				W11	29.71	YES	73°N		*North*		*North*				
				W12	24.02	NO	73°N		*North*		*North*				
												50	NO	23	NO
Eighth	R1	Residential	Bedroom	W1	36.24	YES	350°N		*North*		*North*				
				W2	37.59	YES	350°N		*North*		*North*				
												8	NO	0	NO
	R2	Residential	Bedroom	W3	37.69	YES	350°N		*North*		*North*				
				W4	37.55	YES	350°N		*North*		*North*				
				W5	36.27	YES	350°N		*North*		*North*				
												8	NO	0	NO
	R3	Residential	LKD	W6	7.45	NO	249°	17	NO	17	YES				
				W7	31.07	YES	162°	61	YES	28	YES				
				W8	31.12	YES	162°	61	YES	28	YES				
				W9	32.10	YES	162°	64	YES	28	YES				
				W10	35.31	YES	73°N		*North*		*North*				

Project Name: 294-295 High Holborn
Project No.: 125123 - 02
Report Title: Internal Daylight Assessment - VSC & APSH Analysis
Date of Analysis: 20/03/2017

Floor Ref.	Room Ref.	Property Type	Room Use.	Window Ref.	VSC	Meets BRE Criteria	Window Orientation	Annual	Meets BRE Criteria	Winter	Meets BRE Criteria	Total Suns per Room Annual	Meets BRE Criteria	Total Suns per Room Winter	Meets BRE Criteria
				W11	36.57	YES	73°N		*North*		*North*				
				W12	35.01	YES	73°N		*North*		*North*				
												68	NO	28	NO

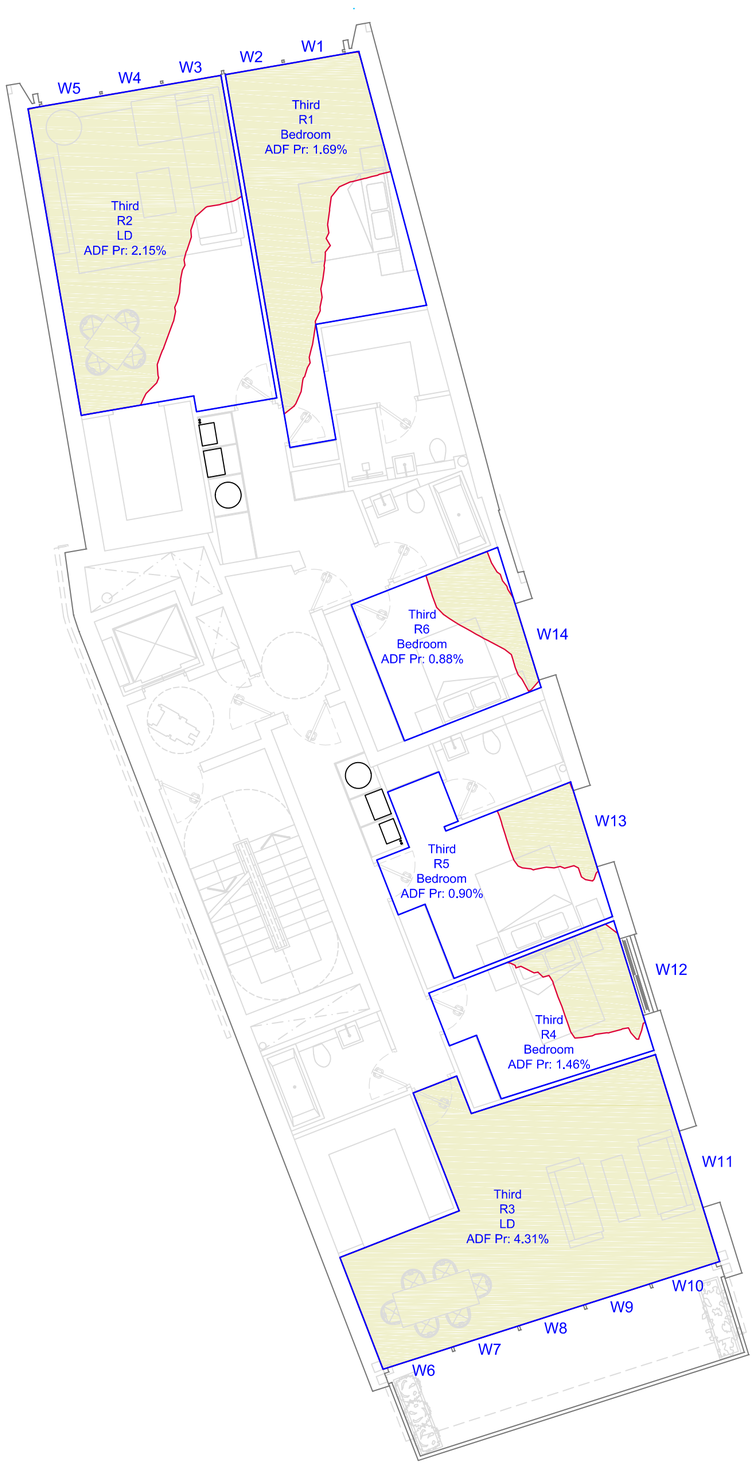
Project Name: 294-295 High Holborn
Project No.: 125123-02
Report Title: Internal Daylight Assessment - Daylight Distribution Analysis
Date of Analysis: 20/03/2017

Floor Ref.	Room Ref.	Property Type	Room Use.		Room Area	Lit Area Proposed	Meets BRE Criteria
294-295 High Holborn							
Third	R1	Residential	Bedroom	Area m2	22.31	14.98	
				% of room		67%	NO
	R2	Residential	LD	Area m2	31.57	22.89	
				% of room		73%	NO
	R3	Residential	LD	Area m2	34.53	34.53	
				% of room		100%	YES
	R4	Residential	Bedroom	Area m2	11.73	4.23	
				% of room		36%	NO
	R5	Residential	Bedroom	Area m2	14.90	3.05	
				% of room		20%	NO
	R6	Residential	Bedroom	Area m2	11.27	3.25	
				% of room		29%	NO
Fourth	R1	Residential	Bedroom	Area m2	22.31	17.53	
				% of room		79%	NO
	R2	Residential	LD	Area m2	31.57	24.86	
				% of room		79%	NO
	R3	Residential	LD	Area m2	34.53	34.53	
				% of room		100%	YES
	R4	Residential	Bedroom	Area m2	11.73	9.20	
				% of room		78%	NO
	R5	Residential	Bedroom	Area m2	14.90	6.17	
				% of room		41%	NO
	R6	Residential	Bedroom	Area m2	11.27	3.91	
				% of room		35%	NO
Fifth	R1	Residential	Bedroom	Area m2	19.69	19.69	
				% of room		100%	YES
	R2	Residential	LKD	Area m2	35.57	32.11	
				% of room		90%	YES
	R3	Residential	LKD	Area m2	39.05	39.05	
				% of room		100%	YES
	R4	Residential	Bedroom	Area m2	10.22	6.98	
				% of room		68%	NO
	R5	Residential	Bedroom	Area m2	18.80	7.14	
				% of room		38%	NO
Sixth	R1	Residential	Bedroom	Area m2	19.66	19.66	
				% of room		100%	YES
	R2	Residential	LKD	Area m2	36.04	36.04	
				% of room		100%	YES
	R3	Residential	LKD	Area m2	38.74	38.53	
				% of room		99%	YES
	R4	Residential	Bedroom	Area m2	10.71	8.88	
				% of room		83%	YES
	R5	Residential	Bedroom	Area m2	18.80	9.23	
				% of room		49%	NO
Seventh	R1	Residential	Bedroom	Area m2	16.12	16.12	
				% of room		100%	YES
	R2	Residential	Bedroom	Area m2	23.27	23.26	
				% of room		100%	YES

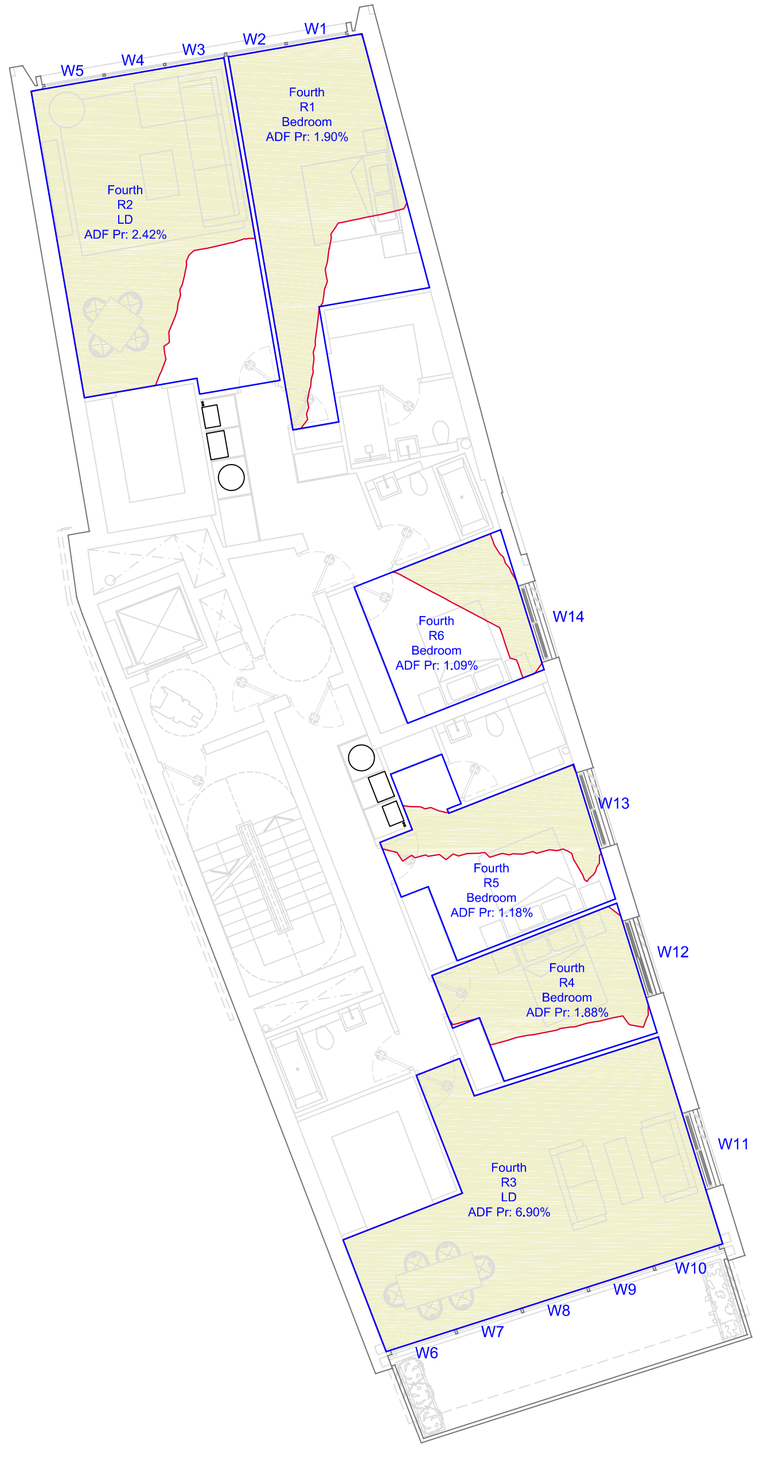
Project Name: 294-295 High Holborn
Project No.: 125123-02
Report Title: Internal Daylight Assessment - Daylight Distribution Analysis
Date of Analysis: 20/03/2017

Floor Ref.	Room Ref.	Property Type	Room Use.		Room Area	Lit Area Proposed	Meets BRE Criteria
	R3	Residential	LKD	Area m2	54.25	54.25	
				% of room		100%	YES
Eighth	R1	Residential	Bedroom	Area m2	16.12	16.12	
				% of room		100%	YES
	R2	Residential	Bedroom	Area m2	23.27	23.27	
				% of room		100%	YES
	R3	Residential	LKD	Area m2	54.25	54.25	
				% of room		100%	YES

Third Floor
294-295 High Holborn



Fourth Floor
294-295 High Holborn



NOTES:
No dimensions are to be scaled from this drawing. All dimensions are to be checked on site, where discrepancy occurs between specification and drawings the supervising officer must be notified.

Analysis

Produced using Waldram Tools
MBS Survey Software Ltd (www.surveymbs.com)

Existing Model & Surrounding Model

Models derived from 3d terrestrial laser scan survey pointcloud.

Supplemented with site photography, Bing maps and Google Streetmaps.

Proposed Model

151-10-Proposed-10-03-2017.DWG
151-10-Proposed Elevations-10-03-2017.DWG
151-10-Proposed Sections-10-03-2017.DWG

KEY

- Room Area (Measured Layout)
- Proposed Sky Area
- Area with Sky Visibility

REV:	DATE:	DESCRIPTION:
-	-	-

Watts.

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CHH London Ltd

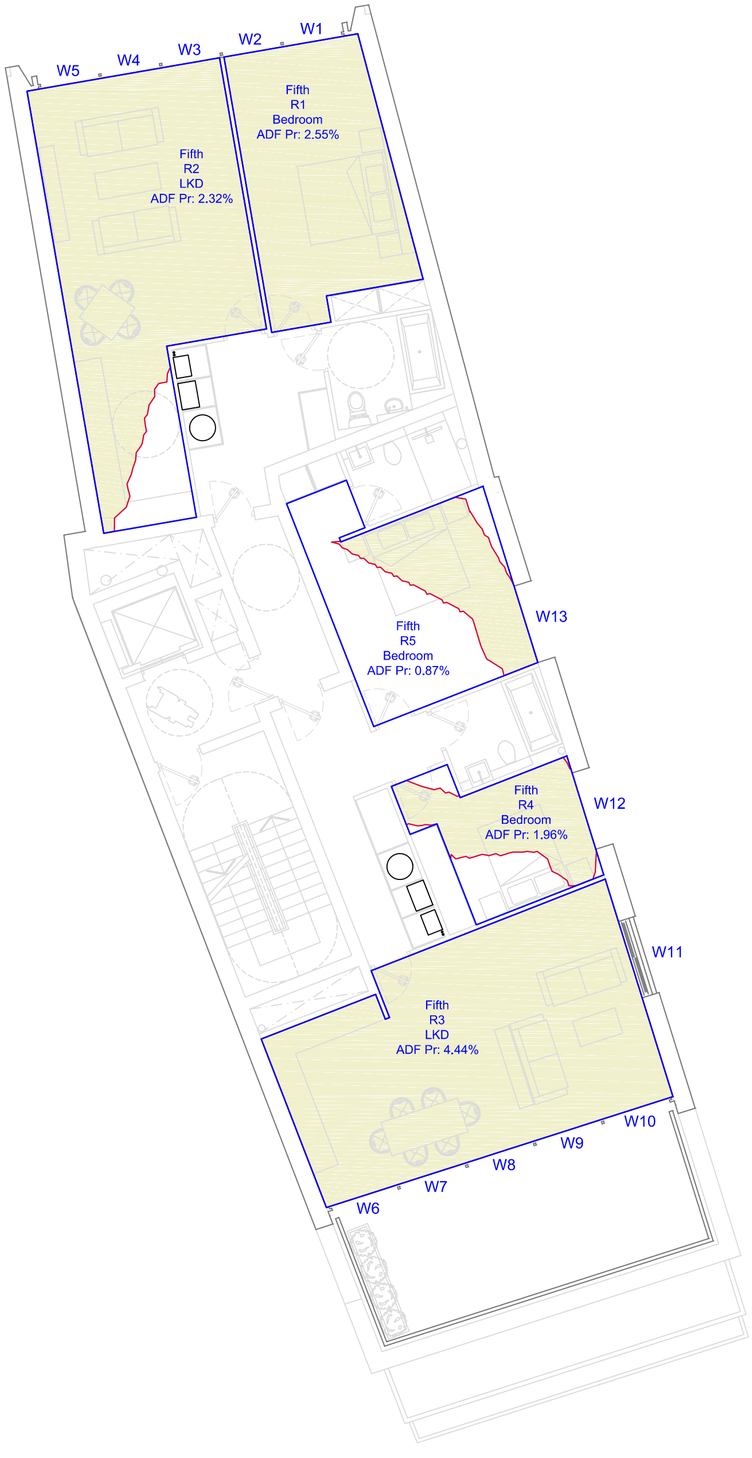
PROPERTY:
294-295 High Holborn
London

DRAWING TITLE:
Daylight Distribution & ADF Values

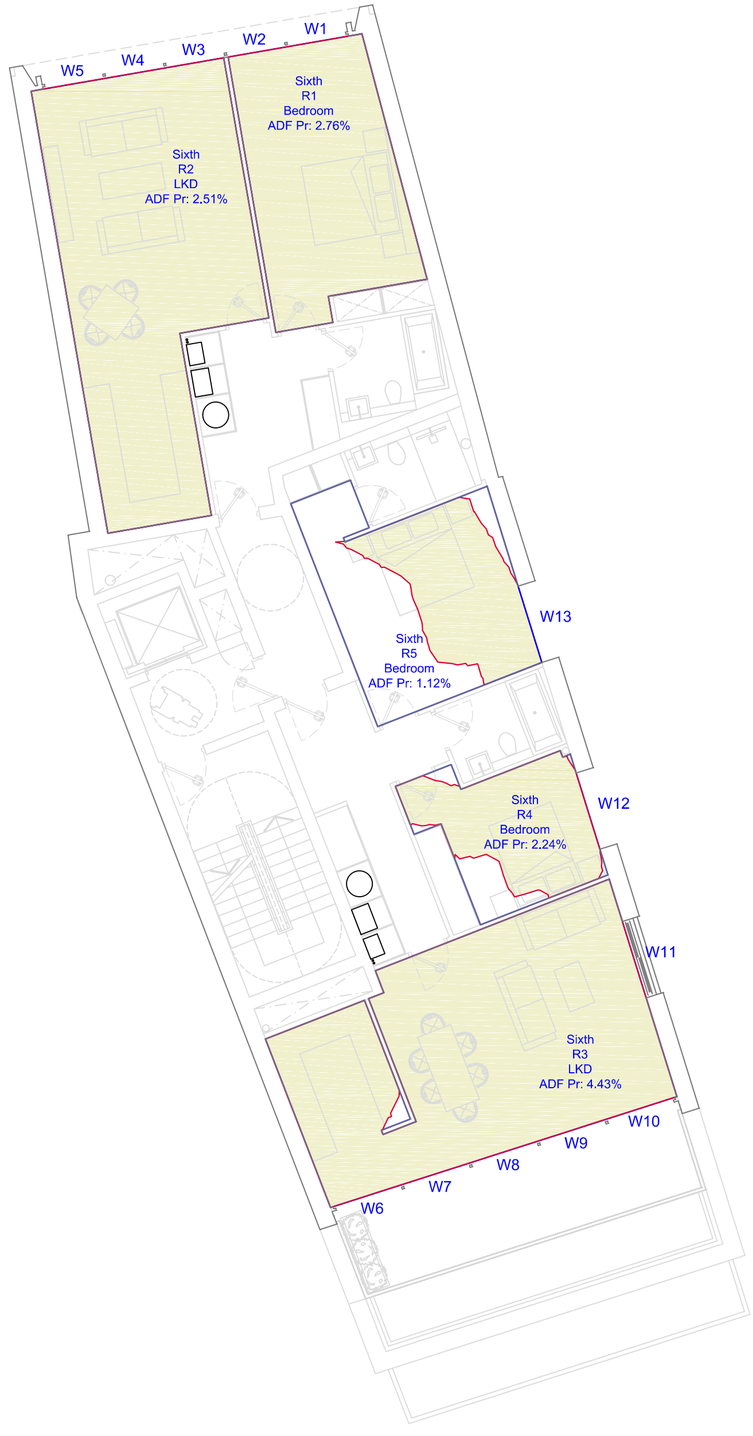
SCALE @ A1:	DATE:	DRAWN:	JM
NTS	**20.03.17**	CHECKED:	CC

DRAWING NUMBER:	REV:
125123-02-04	-

Fifth Floor
294-295 High Holborn



Sixth Floor
294-295 High Holborn



NOTES:
No dimensions are to be scaled from this drawing. All dimensions are to be checked on site, where discrepancy occurs between specification and drawings the supervising officer must be notified.

Analysis

Produced using Waldram Tools
MBS Survey Software Ltd (www.surveymbs.com)

Existing Model & Surrounding Model

Models derived from 3d terrestrial laser scan survey pointcloud.

Supplemented with site photography, Bing maps and Google Streetmaps.

Proposed Model

151-10-Proposed-10-03-2017.DWG
151-10-Proposed Elevations-10-03-2017.DWG
151-10-Proposed Sections-10-03-2017.DWG

KEY

- Room Area (Measured Layout)
- Proposed Sky Area
- Area with Sky Visibility

REV:	DATE:	DESCRIPTION:
.	.	.

Watts.

Watts Group Limited
1 Great Tower Street
London EC3R 5AA
T: 020 7280 8000
watts.co.uk

CLIENT:
CHH London Ltd

PROPERTY:
294-295 High Holborn
London

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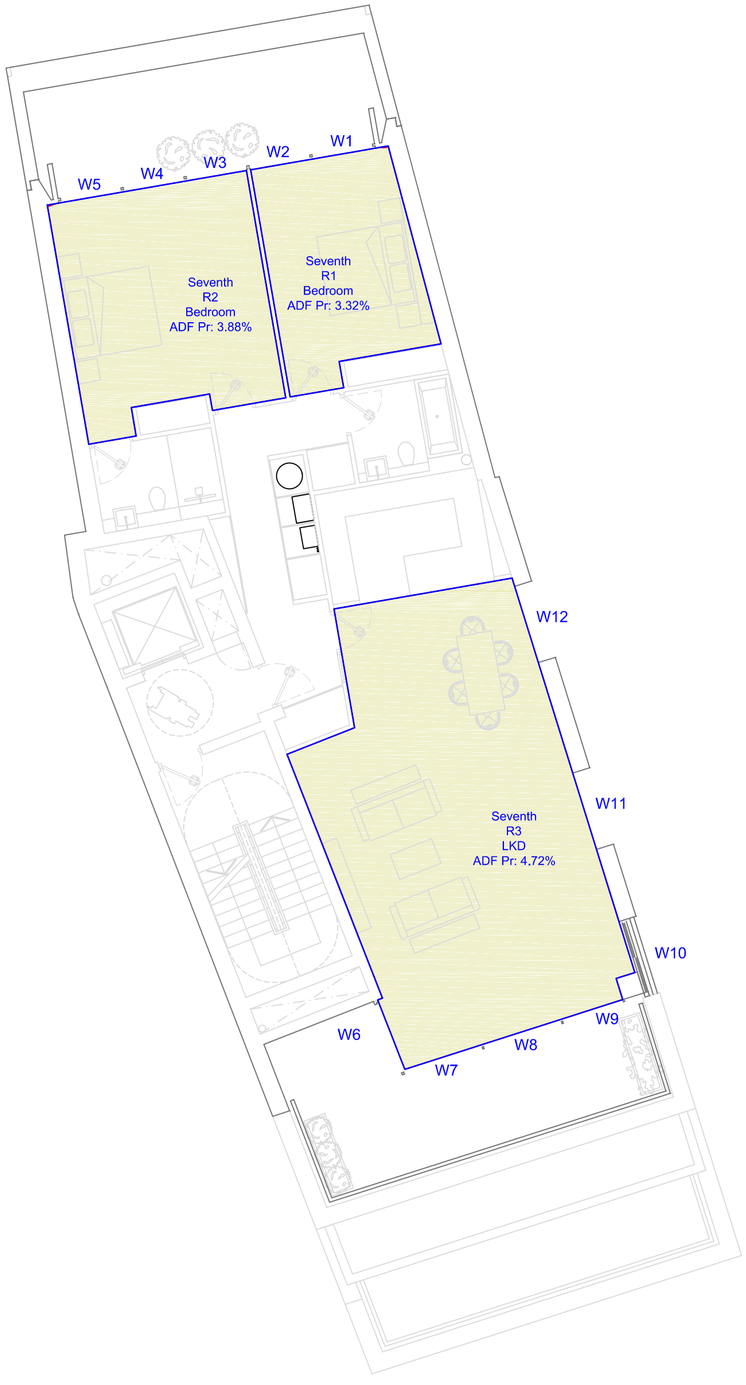
Daylight Distribution & ADF Values

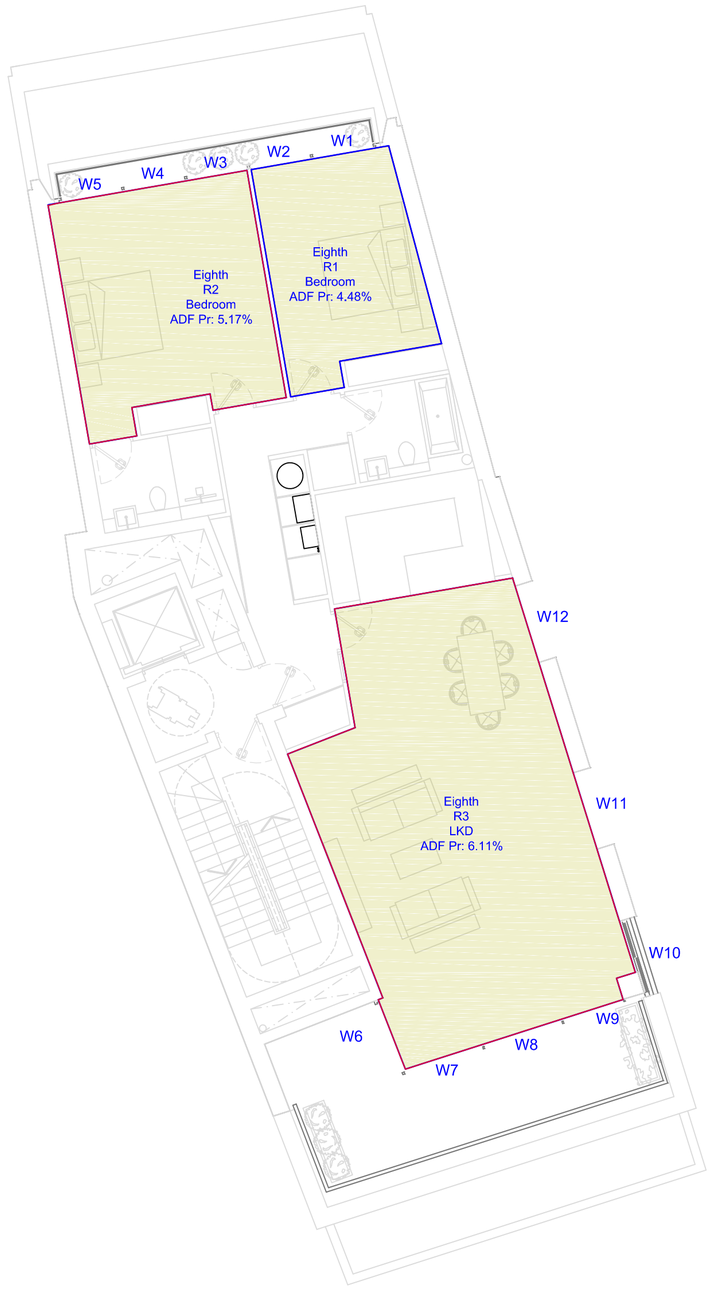
SCALE @ A1:	DATE:	DRAWN:	JM
NTS	**20.03.17**	CHECKED:	CC

DRAWING NUMBER:	REV:
125123-02-05	.

Seventh Floor
294-295 High Holborn



Eighth Floor
294-295 High Holborn



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Analysis

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MBS Survey Software Ltd (www.surveymbs.com)

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Proposed Model

151-10-Proposed-10-03-2017.DWG
151-10-Proposed Elevations-10-03-2017.DWG
151-10-Proposed Sections-10-03-2017.DWG

KEY

- Room Area (Measured Layout)
- Proposed Sky Area
- Area with Sky Visibility

REV:	DATE:	DESCRIPTION:
-	-	-

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294-295 High Holborn
London

DRAWING TITLE:
Daylight Distribution & ADF Values

SCALE @ A1:	DATE:	DRAWN:	CHECKED:
NTS	**20.03.17**	JM	CC

DRAWING NUMBER: 125123-02-06

REV: -

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