

Daylight Analysis

19 Fitzroy Square

BREEAM DR 2014

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Introduction

An analysis of the daylight condition of the 19 Fitzroy Square development has been carried out. The project comprises the refurbishment of five-bedroom house located in the London Borough of Camden.

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Summary:

A daylight analysis was conducted for the proposed development, located on the 19 Fitzroy Square. The daylight conditions of the kitchen/dining room, drawing room and the study have been analysed. The daylight analysis concludes that all the analysed spaces have adequate daylight conditions and two credits can be awarded under the Hea 01 credit of the BREEAM Domestic Refurbishment 2014.

Aim:

The daylighting analysis was undertaken to demonstrate compliance with the BREEAM DR 2014 Hea 01-Daylighting credit for the kitchen/dining room, drawing room and study room of the 19 Fitzroy Square.

The details of the available credits and the requirements are shown below.

BREEAM DR 2014 Hea 01:

Hea 01 Daylighting

Number of credits available	Minimum standards
2	No

Aim

To improve the quality of life in homes through the provision of good daylighting and to reduce the need for energy to light the home.

Assessment criteria

Up to two credits may be awarded for this issue as follows:

First credit – maintaining good daylighting

- 1 For existing dwellings and change of use projects (e.g. conversions):
 - 1.a The refurbishment results in a neutral impact on the dwellings daylighting levels in the kitchen, living room, dining room and study with "no" answered for all questions in Checklist A-7: Daylight Factor, parts 1 and 2 (for existing dwellings) or parts 3 and 4 (for change of use e.g. conversions).
- 2 Where the property is being extended:
 - 2.a New spaces achieve minimum daylighting levels. See CN1
 - 2.b The extension does not significantly reduce daylighting levels in the kitchen, living room, dining room or study of neighbouring properties. See CN4

Second credit – minimum daylighting

- 3 The dwelling achieves minimum daylighting levels in the kitchen, living room, dining room and study. See CN1

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BREEAM DR 2014 Hea 01:
(Continued)

Compliance notes		
CN1	Minimum daylighting levels	<p>First Credit – New spaces created from an extension</p> <ol style="list-style-type: none"> 1. Where any new spaces created meet a minimum average daylight factor including: <ol style="list-style-type: none"> a. Where kitchens achieve a minimum daylight factor of at least 2% b. Where living rooms, dining rooms and studies achieve a minimum average daylight factor of at least 1.5% c. Where 80% of the working plane in each new space including kitchens, living rooms, dining rooms and studies, receive direct light from the sky 2. Where the dwelling is extended (including loft conversions), 80% of the working plane in each new space created including a kitchen, living room, dining room and study, receives direct light from the sky 3. There is a neutral impact on existing spaces as a result of refurbishment in accordance with criterion 1 <p>Second Credit – Existing dwellings and dwellings created from a change of use (i.e. conversions):</p> <p>One credit is awarded where the dwelling achieves the following daylighting criteria:</p> <ol style="list-style-type: none"> 1. Where kitchens achieve a minimum daylight factor of at least 2% 2. Where living rooms, dining rooms and studies achieve a minimum average daylight factor of at least 1.5% 3. Where 80% of the working plane in the kitchen, living room, dining room and study, receives direct light from the sky

Methodology:

The daylight analysis was based on the 14113_20_200C, 14113_20_201A, 14113_20_202A, 14113_20_203C, 14113_20_210A, 14113_20_211 and 14113_20_212A drawings provided by Andrew Lett Architects.

The daylight conditions of the analysed spaces have been calculated according to the formulas provided in the BRE Report "Site Layout Planning for Daylight and Sunlight - A guide to good practice" (second edition) by Paul Littlefair.

Basis for Calculations:

The following values have been used for the daylight calculations:

- Area weighted reflectance of the room surface (ceiling, floor walls and windows of 0.5;
- Correction factor for dirt of 0.9, which corresponds to vertical glazing that can be cleaned easily;
- Glass transmission factor of 0.65 (double glazing with low emissivity coating);
- Working Plane of 0.85m above the floor.

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BREEAM DR 2014 Criteria

According to the BREEAM DR 2014 Hea 01-Daylighting criteria, kitchens must have an average daylight factor of 2% and the living room, dining room and study must have an average daylight factor of at least 1.5%.

Daylight Factor Criterion

The following table shows the calculation for the Average Daylight Factor (ADF) and the compliance with the BREEAM DR 2014 Hea 1-Daylighting criteria.

Room	Area (m ²)		Angle of Visible Sky (°)	Calculated ADF (%)	Compliance
	Room surface	Glazed			
Kitchen / Dining room	217.05	8.98 2.88	46.7 58.84	2.12	PASS
Drawing Room	123.74	11.05	65	4.53	PASS
Study Room	135.32	9.58	65	3.59	PASS

Direct light from the sky criterion

The following table shows the calculation for the area that receives direct light from the sky and the compliance with the BREEAM DR 2014 Hea 1-Daylighting criteria.

Room	Room depth (m)	No-sky line depth (m)	% of area with direct view of the sky	Compliance
Kitchen / Dining room	5.87	>5.87	100%	PASS
Drawing Room	4.66	>4.66	100%	PASS
Study Room	5.02	>5.02	100%	PASS

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The daylighting analysis shows that all analysed spaces of the 19 Fitzroy Square receive adequate daylight levels according to the BREEAM DR 2014 Hea 01 requirements. The results of daylight analysis and the awarded credits for each house/apartment are presented in the table below.

Conclusion

According to the BREEAM DR 2014 Hea 01 Daylight credit, to promote good daylight and thereby improve the quality of life and reduce the need for energy to light the home, the following requirements should be met:

- Kitchen must have an Average Daylight Factor of at least 2% (1 credit)
- Living room, dining room and study room must achieve a minimum Average Daylight Factor of at least 1.5% (1 credit)
- At least 80% of the working plane in each kitchen, living room, dining room and study room must receive direct light from the sky

The following table shows the daylight results for the kitchen/dining room, living room and study room of the 19 Fitzroy Square scheme and compliance with the BREEAM DR 2014 Hea 01- Daylighting credit.

Unit	Average Daylight Factor (%)			Area of the working plane with direct light from the sky (%)			Credits Awarded
	Kitchen / Dining	Living room	Study room	Kitchen / Dining	Living room	Study room	
19 Fitzroy Square	2.12	4.53	3.59	100	100	100	2