



ABBEYCONSULTANTS

Sunlight and Daylight Report

80-82 Highgate Road, London, NW5
1PB

Houshang Sakhai

Report No: PA-DAY-HR-HS-24-01

Report Date: August 2024

About Abbey Consultants (Southern) Ltd

Abbey Consultants (Southern) Ltd is an established consultancy practice specialising in providing building solutions throughout the UK.

We offer a full range of independent energy and sustainability services from pre-planning through to completion for both residential and commercial buildings from small individual properties through to highly complex mixed-use developments.

We are an industry leader in delivering a professional, accredited and certified service to a wide range of clients including architects, developers, builders, housing associations, the public sector and private householders.

Employing highly qualified staff, our team comes from a variety of backgrounds within the construction industry with combined knowledge of building design, engineering, assessment, construction, development, research and surveying.

Abbey Consultants maintains its position at the forefront of changes in building regulations as well as technological advances. Our clients, large or small are therefore assured of a cost effective, cohesive and fully integrated professional service.

About the Authors

Andrew Webb is a Senior Sustainability Consultant at Abbey Consultants (Southern) Ltd. Andrew has a BSC with honours in Environmental Management and over 6 years' experience in providing sustainable building solutions and leads the Dynamic Modelling team at Abbey Consultants. He undertakes daylighting, sunlight and shadow cast analysis for planning applications. Andrew is also a qualified BREEAM AP and assessor and Code for Sustainable Homes assessor and has worked with some of the UK's largest national and regional developers, as well as housing associations and local authorities.

Assessment Information

Nature of Assessment:	Sunlight and Daylight Report-80-82 Highgate Road
Project Name:	80-82 Highgate Road
Project Address:	80-82 Highgate Road, London, NW5 1PB
Client:	Houshang Sakhai
Architect:	HealyCornelius
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Issue Number	Date	Reason	Author
01	30/08/2024	Issue	AW

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2. GLOSSARY

Average daylight factors (ADF) - Ratio of total daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky. Thus a 1% ADF would mean that the average indoor illuminance would be one hundredth the outdoor unobstructed illuminance.

Daylight, natural light - Combined skylight and sunlight

Probable sunlight hours - The long-term average of the total number of hours during a year in which direct sunlight reaches the unobstructed ground (when clouds are taken into account)

CIE standard overcast sky - A completely overcast sky for which the ratio of its luminance L_y at an angle of elevation y above the horizontal to the luminance L_z at the zenith is given by:

$$L_y = L_z (1 + 2\sin y) / 3$$

A CIE standard overcast sky is darkest at the horizon and brightest at the zenith (vertically overhead)

Vertical sky component (VSC) - Ratio of that part of illuminance, at a point on a given vertical plane, that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of the sky. Usually the 'given vertical plane' is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings

Annual probable sunlight hours (APSH) - The number of annual sunlight hours an unobstructed area would receive.

Winter probable sunlight hours (APSH) - The number of winter sunlight hours an unobstructed area would receive.

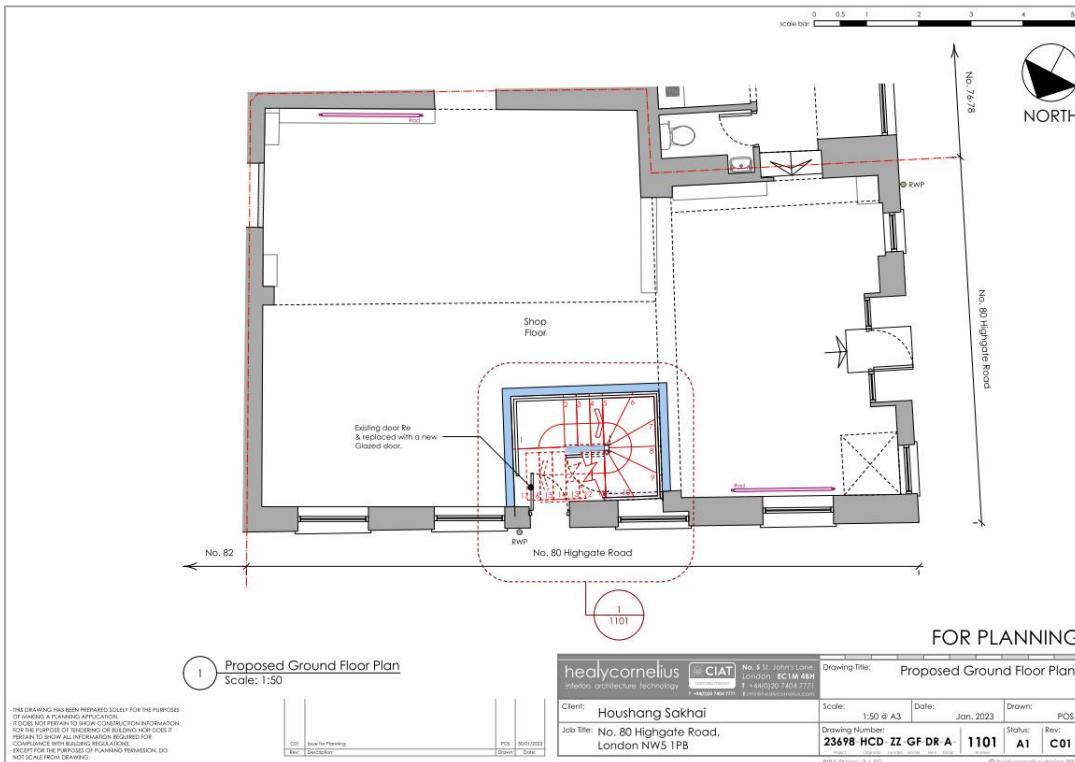
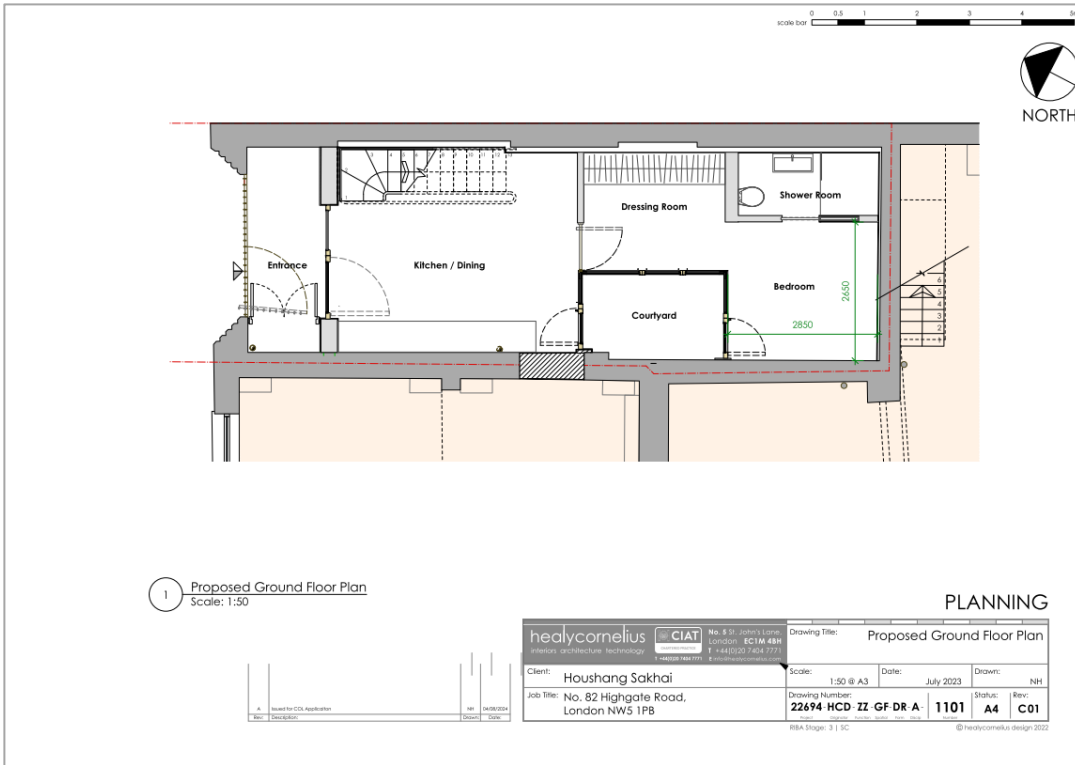
No sky line - The outline on the working plane of the area from which no sky can be seen

Obstruction angle - The angular altitude of the top of an obstruction above the horizontal, measured from a reference point in a vertical plane in a section perpendicular to the vertical plane.

Sky Factor - Ratio of the parts of illuminance at a point on a given plane that would be received directly through unglazed openings from a sky of uniform luminance, to illuminance on a horizontal plane due to the unobstructed hemisphere of this sky. The sky factor does not include reflected light, either from outdoor or indoor surfaces.

Working Plane - Horizontal, vertical or inclined plane in which a visual task lies. Normally the working plane may be taken to be horizontal, 0.85m above the floor in houses and factories, 0.7m above the floor in offices.

3. PROPOSED DEVELOPMENT



4. EXECUTIVE SUMMARY

Abbey Consultants (Southern) Ltd have been instructed by Houshang Sakhai to review the internal Sunlight and Daylight on the proposed 80-82 Highgate Road development to determine if the proposed scheme complies with good practice guidelines.

The aim of the study is to assess the levels of internal light available in all of the proposed habitable rooms. The study is based on the various numerical tests laid down in the Building Research Establishments (BRE) guide 'Site Layout Planning for Daylight and Sunlight: a guide to good practice' by P J Littlefair 2011.

The Sunlight and Daylight analysis reviews the scheme against the good practice guidance as set out in "Site Layout Planning for Daylight and Sunlight: A guide to good practice v6" (2022), with regard to the available daylight in the proposed dwelling.

The Target Daylight Factor analysis as per appendix 1 and 2, confirms that with the proposed design and window schedule 100% of the rooms across the development exceed the minimum 50% threshold compliance requirement for good practice daylight factors and the proposed site is therefore in full compliance with good practice.

Each of the first floor habitable rooms exceed the 1.5 hours of direct sunlight on March 21st in excess of the minimum 1 habitable room required the proposed development is deemed to be in full compliance with the sunlight requirements of the BRE guide.

The above numerical results confirm that all of the habitable rooms in the proposed development exceed the good practice internal daylight levels and therefore the proposed development is in full compliance with good practice and sunlight and daylight should not be considered a constraint to the planning application.

5. INFORMATION SOURCES

5.1 DOCUMENTS CONSIDERED

This report has been produced based on the following drawings:

Table 1: Documents Considered

Drawing Title	Issue Date	Drawing Number
80 - Proposed Ground Floor Plan	Jan 2023	1101 - Rev C01
80 - Proposed First Floor Plan	Feb 2024	1202 - Rev C01
80 - Proposed Roof Plan	Jan 2023	1203 - Rev C02
80 - Proposed Sections	Jan 2023	3101 - Rev C01
80 - Existing Elevations	Jan 2023	2001 - Rev C01
82 - Proposed Ground Floor Plan	July 2023	1101 - Rev C01
82 - Proposed First Floor Plan	Aug 2024	1102 - Rev P01
82 - Proposed Sections	Aug 2024	3101 - Rev P01

6. NATIONAL PLANNING POLICY FRAMEWORK

The BRE numerical guidelines should be considered in the context of the National Planning Policy Framework (NPPF) 2019, which stipulates that local planning authorities should take a flexible approach to daylight and sunlight to ensure the efficient use of land. The NPPF states:

"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)."

7. METHODOLOGY OF THE STUDY

7.1 BRE GUIDE: SITE LAYOUT PLANNING FOR DAYLIGHT AND SUNLIGHT

The study is based on the various numerical tests laid down in the Building Research Establishment (BRE) guide 'Site Layout Planning for Daylight and Sunlight: a guide to good practice' 2022 Edition. In general, the BRE tests are based on the requirements of the British Standard, BS EN 17037.

The standards set out in the BRE guide are intended to be used flexibly. The following sentiments are taken from the BRE guide:

(Its) "main aim is... to help to ensure good conditions in the local environment, considered broadly, with enough sunlight and daylight on or between buildings for good interior and exterior conditions." (Para 1.1)

"The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and this document should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer." (Para 1.6)

"Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design." (Para 1.6)

The BRE guide is an advisory document, not a rigid set of rules. Care must therefore be taken to apply its recommendations in a manner fitting to the location of the proposed development.

In theory the BRE report's numerical guidelines may be applied to any setting, whether that is a city centre, suburban area or rural village. However, it notes, "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... The calculation methods...are entirely flexible in this respect." (Para 1.6)

At paragraph 2.2.3 it states "Note that numerical values given here are purely advisory. Different criteria may be used, based upon the requirements for daylighting in an area viewed against other site layout constraints." Appendix F of the BRE Guide gives advice on setting alternative target values for skylight access. At page 62 it states "different targets may be used, based on the special requirements of the proposed development or its location".

Rigid application of the numerical guidelines could well give rise to an inappropriate answer and form of development for city centre sites, in which case it may be appropriate to adopt lower target values that are more appropriate to the location concerned.

7.2 DAYLIGHT TO WINDOWS

Diffuse daylight is the light received from the sun which has been diffused through the sky. Even on a cloudy day when the sun is not visible, a room will continue to be lit with light from the sky. This is diffuse daylight.

Diffuse daylight calculations should be undertaken to all rooms where daylight is required, including living rooms, kitchens and bedrooms. Usually, if a kitchen is less than 13m² it is considered to be a non-habitable room and the daylight tests need not be applied. The BRE guide states that windows to bathrooms, toilets, storerooms, circulation areas and garages need not be analysed.

The BRE guide contains two tests which measure diffuse daylight:

7.2.1 Test 1 Vertical Sky Component

The percentage of the sky visible from the centre of a window is known as the Vertical Sky Component. Diffuse daylight may be adversely affected if after a development the Vertical Sky Component is both less than 27% and less than 0.8 times its former value.

7.2.2 Test 2 Daylight Distribution

The BRE guide states that where room layouts are known, the impact on the daylighting distribution can be found by plotting the 'no sky line' in each of the main rooms. The no-sky line is a line which separates areas of the working plane that can and cannot have a direct view of the sky. Daylight may be adversely affected if after the development the area of the working plane in a room which can receive direct skylight is reduced to less than 0.8 times its former value.

7.2.3 Test 3 Target Daylight Factors

Point values for the daylight factors need to be calculated throughout an assessed room with a minimum target value determined by room type and site latitude in line with the below table, each of the habitable room types assessed need to achieve the target daylight factor values for a at least 50% of the assessed floor area, excluding a 0.3m boarder around the room.

Table C3 – Target daylight factors (D_T) to achieve over at least 50% of the assessment grid in UK domestic habitable rooms with vertical and/or inclined daylight apertures			
Location	D_T for 100 lx (Bedroom)	D_T for 150 lx (Living room)	D_T for 200 lx (Kitchen)
St Peter (Jersey)	0.6%	0.9%	1.2%
London (Gatwick Airport)	0.7%	1.1%	1.4%
Birmingham	0.6%	0.9%	1.2%
Hemsby (Norfolk)	0.6%	0.9%	1.3%
Finningley (Yorkshire)	0.7%	1.0%	1.3%
Aughton (Lancashire)	0.7%	1.1%	1.4%
Belfast	0.7%	1.0%	1.4%
Leuchars (Fife)	0.7%	1.1%	1.4%
Oban	0.8%	1.1%	1.5%
Aberdeen	0.7%	1.1%	1.4%

8. RESULTS

8.1 INTERNAL TARGET DAYLIGHT FACTORS

A 3D simulation on DesingBuilder version 7.2.0.032 was utilised to calculate the Daylight Factors for the newly proposed dwellings across an analysis grid at working place height, in line with the BRE methodology set out in BR209 2022 version.

As the nearest available assessment location to the proposed site is London (Gatwick Airport) Target Daylight Factor targets of 0.7% for bedrooms 1.1% for living rooms and 1.4% for the kitchens have been adopted.

The Target Daylight Factor analysis as per appendix 1 and 2, confirms that with the proposed design and window schedule 100% of the rooms across the development exceed the minimum requirements for good practice daylight factors and the proposed site is therefore in full compliance with good practice.

8.2 1.5 HOURS OF SUNLIGHT ON MARCH 21ST

Access to sunlight can be quantified. BS EN 17037 [1] recommends that a space should receive a minimum of 1.5 hours of direct sunlight on a selected date between 1 February and 21 March with cloudless conditions. It is suggested that 21 March (equinox) be used. The medium level of recommendation is three hours and the high level of recommendation four hours. For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion.

In line with the above, calculations have been carried out which concluded that all habitable rooms at 80 Highgate Road and all the top floor habitable rooms, including the living room at 82 Highgate Road are achieving in excess of 1.5 hours of direct sunlight on 21st March. However in compliance with the BRE guide all dwellings have at least one habitable room complying as well as all of the living/kitchens exceed 1.5 hours.

As all dwellings have at least one habitable room exceeding the 1.5 hours of direct sunlight on March 21st and all Living Rooms/Kitchens comply, the proposed development is deemed to be in full compliance with the sunlight requirements of the BRE guide.

9. CONCLUSION

Abbey Consultants (Southern) Ltd have been instructed by Houshang Sakhai to review the Sunlight and Daylight impacts on the proposed 80-82 Highgate Road development to determine if the proposed scheme complies with good practice guidelines.

The Sunlight and Daylight analysis reviews the scheme against the good practice guidance as set out in "Site Layout Planning for Daylight and Sunlight: A guide to good practice v6" (2022), with regard to the available daylight in the proposed dwelling.

The Target Daylight Factor analysis as per appendix 1 and 2, confirms that with the proposed design and window schedule 100% of the rooms across the development exceed the minimum 50% threshold compliance requirement for good practice daylight factors and the proposed site is therefore in full compliance with good practice.

As all dwellings have at least one habitable room exceeding the 1.5 hours of direct sunlight on March 21st and all Living Rooms/Kitchens comply, the proposed development is deemed to be in full compliance with the sunlight requirements of the BRE guide.

The above numerical results confirm that all of the habitable rooms in the proposed development exceed the good practice internal daylight levels and therefore the proposed development is in full compliance with good practice and sunlight and daylight should not be considered a constraint to the planning application.

APPENDIX 1: TARGET DAYLIGHT FACTOR AND SUNLIGHT RESULTS

Block	Zone	Threshold daylight factors	Floor Area (m2)	Floor Area above Threshold (m2)	Floor Area above Threshold (minimum 50%)	1.5 hours of sunlight (21st March)
82 Ground Floor	Kitchen	1.4	18.29	9.337	51.05	No
82 Ground Floor	Bedroom	0.7	13.757	8.855	64.37	No
82 First Floor	Bedroom	0.7	13.655	13.655	100.00	Yes
82 First Floor	Living	1.1	23.52	23.52	100.00	Yes
80 First Floor	1 Bedroom	0.7	16.193	12.406	76.61	Yes
80 First Floor	1 Living Kitchen	1.1	16.915	16.915	100.00	Yes
80 First Floor	2 Bedroom	0.7	11.251	7.635	67.86	Yes
80 First Floor	2 Living Kitchen	1.1	14.42	14.42	100.00	Yes

APPENDIX 2: TARGET DAYLIGHT FACTOR ANALYSIS

Figure 1: Internal Daylight Map 82 Highgate Road Ground Floor

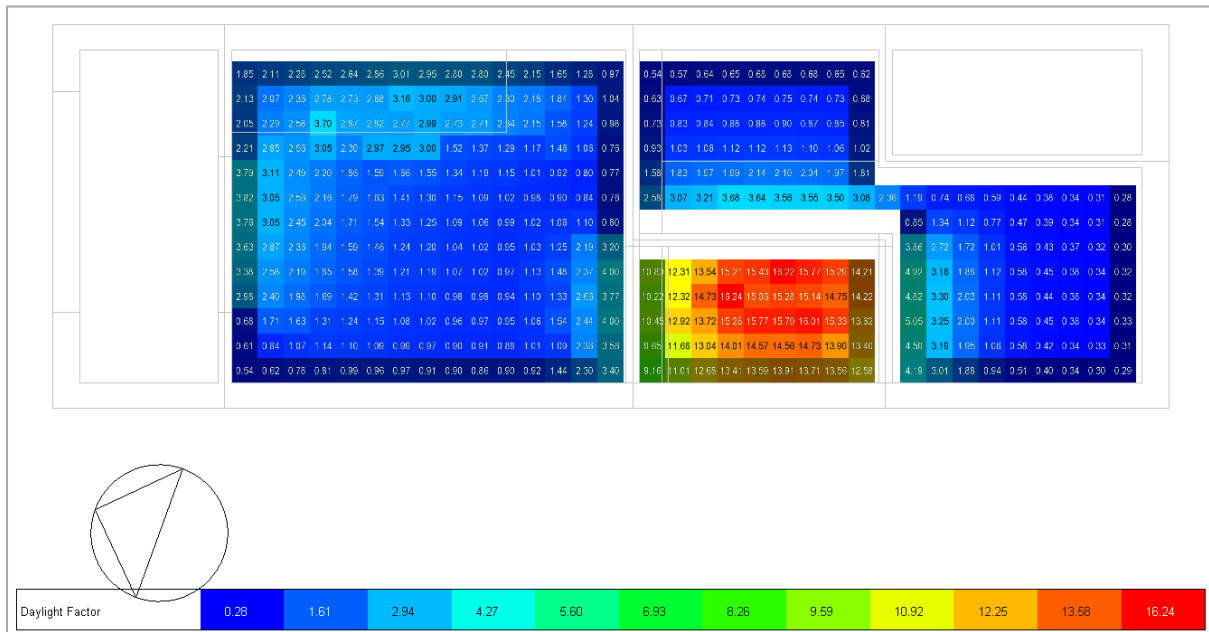


Figure 2: Internal Daylight Map 82 Highgate Road First Floor

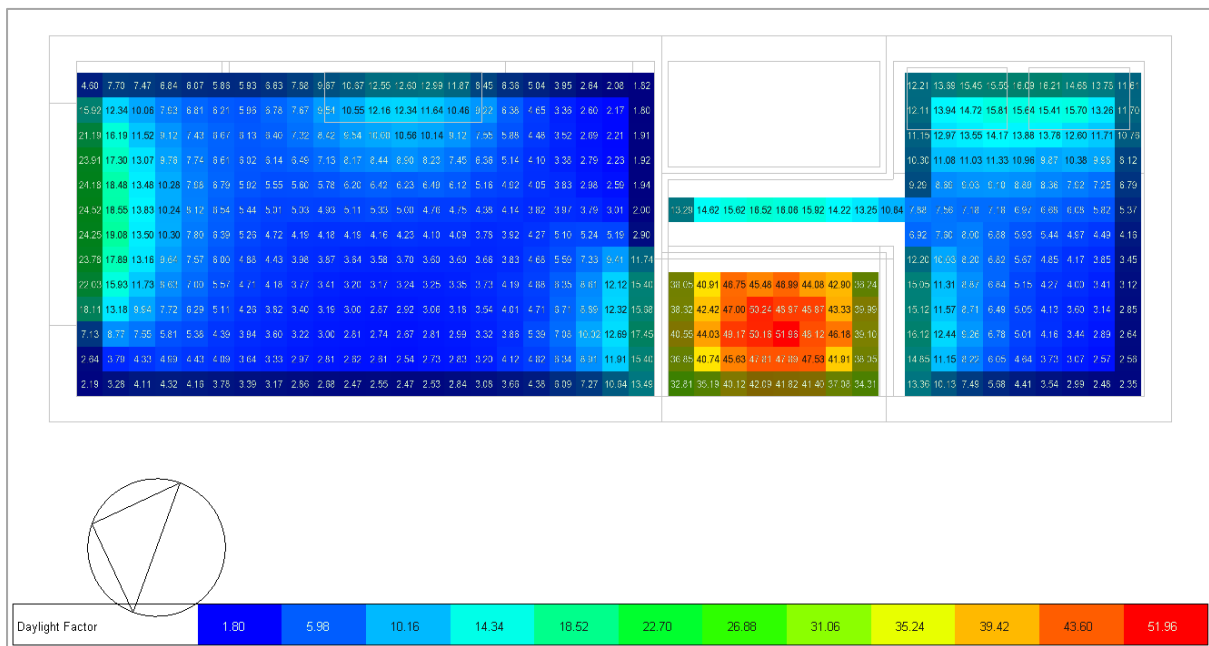


Figure 3: Internal Daylight Map 80 Highgate Road First Floor

