Daylight Analysis

Larkfield House, Coldcut Rd
Co. Dublin

24/03/2021

Contents

1. Executive Summary

H3D were engaged by Hughes Planning and Development Consultants to provide a daylight/sunlight assessment for the proposed development at Larkfield House, Coldcut Rd, Co. Dublin. H3D were instructed to carry out the following:

- To create a 3D computer analysis model of the scheme based upon drawings provided by HA Design Studio
- Analyse the Average Daylight Factor (ADF) of the habitable spaces of the proposed development.
- Prepare a report setting out the analysis and the findings.

Methodology

The assessment of the proposed development was prepared using the methodology's set out in the British Standard: Lighting for Buildings – Part 2: Code for Practice for Daylighting, BRE 209, 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice', Second Edition 2011, by P. J. Littlefair and the Design Standards for New Apartments - Guidelines for Planning Authorities (March 2018).

BRE Guide and Advisory Note

The numerical guidelines given in these documents are purely advisory. The BRE Guide states that:

> "The advice given here is not mandatory and the guide should not be 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."
>
> "It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location" (Section 1.6, p1)

Overall Conclusion.

In our opinion, after carrying out a comprehensive daylight and sunlight assessment of the proposed development using simulation modelling and comparing results achieved against the BRE Guide and BS recommended guidelines, all 130 spaces analysed meet or exceed the guideline levels.

In our opinion, the proposed apartments are considered to provide an acceptable standard of amenity from a daylight perspective.

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2. Average Daylight Factor (ADF)

This portion of the report considers the daylight analysis of the proposed apartments of of Larkfield House. The objective of this analysis is to demonstrate that the proposed residential units provided as part of the proposed development provide an acceptable standard of amenity in respect of daylight.

The BRE document defines ADF as: The 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.

In housing *BS 8206-2:2008: Lighting for buildings - Part 2: Code of practice for daylighting*[1] gives minimum values of ADF of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms. The results of the ADF for the tested rooms are shown in the tables below.

[1] It is noted that BS 8206-2:2008: Lighting for buildings - Part 2: Code of practice for daylighting was recently replaced with BS EN 17037:2018 Daylight in Buildings. However, given that the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities refer to the BS 8206-2:2008 and not to BS EN 17037:2018, BS 8206:2008 has been referenced in the preparation of this report.

Average Daylight Factor (ADF)					
Floor	Unit	Room	Minimum ADF recommended in BS 8206[7]	Predicted ADF	Compliance Demonstrated
Ground Floor	01	Bedroom 1	1.0	2.6	Yes
	01	Living	1.5	1.7	Yes
	02	Bedroom 1	1.0	3.9	Yes
	02	Bedroom 2	1.0	2.3	Yes
	02	Living	1.5	1.9	Yes
	03	Bedroom 1	1.0	3.0	Yes
	03	Bedroom 2	1.0	2.3	Yes
	03	Living	1.5	1.5	Yes
	04	Bedroom 1	1.0	3.0	Yes
	04	Bedroom 2	1.0	2.2	Yes
	04	Living	1.5	1.4	Yes
	05	Bedroom 1	1.0	3.7	Yes
	05	Bedroom 2	1.0	2.2	Yes
	05	Living	1.5	1.6	Yes
	06	Bedroom 1	1.0	4.7	Yes
	06	Bedroom 2	1.0	2.8	Yes
	06	Living	1.5	1.7	Yes
	07	Bedroom 1	1.0	4.5	Yes
	07	Bedroom 2	1.0	2.8	Yes
	07	Living	1.5	1.5	Yes
	08	Bedroom 1	1.0	4.4	Yes
	08	Bedroom 2	1.0	2.8	Yes
	08	Living	1.5	1.6	Yes
	09	Bedroom 1	1.0	4.5	Yes
	09	Bedroom 2	1.0	2.8	Yes
	09	Living	1.5	1.5	Yes
	10	Bedroom 1	1.0	4.4	Yes
	10	Bedroom 2	1.0	2.9	Yes
	10	Living	1.5	1.6	Yes
	11	Bedroom 1	1.0	3.3	Yes
	11	Bedroom 2	1.0	3.4	Yes
	11	Bedroom 3	1.0	2.4	Yes
	11	Living	1.5	8.7	Yes

Average Daylight Factor (ADF)					
Floor	Unit	Room	Minimum ADF recommended in BS 8206[7]	Predicted ADF	Compliance Demonstrated
First Floor	12	Bedroom 1	1.0	4.2	Yes
	12	Bedroom 2	1.0	3.9	Yes
	12	Living	1.5	1.9	Yes
	13	Bedroom 1	1.0	7.9	Yes
	13	Bedroom 2	1.0	4.6	Yes
	13	Bedroom 3	1.0	2.4	Yes
	13	Living	1.5	1.6	Yes
	14	Bedroom 1	1.0	6.6	Yes
	14	Bedroom 2	1.0	3.7	Yes
	14	Living	1.5	1.5	Yes
	15	Bedroom 1	1.0	4.4	Yes
	15	Living	1.5	2.8	Yes
	16	Bedroom 1	1.0	3.2	Yes
	16	Bedroom 2	1.0	2.9	Yes
	16	Living	1.5	1.5	Yes
	17	Bedroom 1	1.0	3.9	Yes
	17	Bedroom 2	1.0	2.8	Yes
	17	Living	1.5	1.7	Yes
	18	Bedroom 1	1.0	3.2	Yes
	18	Bedroom 2	1.0	3.9	Yes
	18	Living	1.5	1.6	Yes
	19	Bedroom 1	1.0	3.7	Yes
	19	Bedroom 2	1.0	2.8	Yes
	19	Living	1.5	1.7	Yes
	20	Bedroom 1	1.0	3.1	Yes
	20	Bedroom 2	1.0	3.9	Yes
	20	Living	1.5	1.6	Yes
	21	Bedroom 1	1.0	2.8	Yes
	21	Bedroom 2	1.0	3.3	Yes
	21	Bedroom 3	1.0	2.3	Yes
	21	Living	1.5	8.7	Yes

Average Daylight Factor (ADF)					
Floor	Unit	Room	Minimum ADF recommended in BS 8206[7]	Predicted ADF	Compliance Demonstrated
Second Floor	22	Bedroom 1	1.0	4.1	Yes
	22	Bedroom 2	1.0	3.8	Yes
	22	Bedroom 3	1.0	3.6	Yes
	22	Living	1.5	1.5	Yes
	23	Bedroom 1	1.0	3.7	Yes
	23	Bedroom 2	1.0	4.0	Yes
	23	Living	1.5	1.7	Yes
	24	Bedroom 1	1.0	4.1	Yes
	24	Bedroom 2	1.0	3.8	Yes
	24	Living	1.5	1.7	Yes
	25	Bedroom 1	1.0	3.8	Yes
	25	Bedroom 2	1.0	4.0	Yes
	25	Living	1.5	1.7	Yes
	26	Bedroom 1	1.0	4.0	Yes
	26	Bedroom 2	1.0	4.8	Yes
	26	Living	1.5	3.1	Yes
	27	Bedroom 1	1.0	3.9	Yes
	27	Bedroom 2	1.0	4.1	Yes
	27	Living	1.5	1.7	Yes
	28	Bedroom 1	1.0	3.0	Yes
	28	Bedroom 2	1.0	4.3	Yes
	28	Living	1.5	1.7	Yes
	29	Bedroom 1	1.0	3.8	Yes
	29	Bedroom 2	1.0	4.1	Yes
	29	Living	1.5	1.7	Yes
	30	Bedroom 1	1.0	3.2	Yes
	30	Bedroom 2	1.0	4.3	Yes
	30	Living	1.5	1.7	Yes
	31	Bedroom 1	1.0	3.9	Yes
	31	Bedroom 2	1.0	3.4	Yes
	31	Bedroom 3	1.0	2.9	Yes
	31	Living	1.5	11.6	Yes

Average Daylight Factor (ADF)					
Floor	Unit	Room	Minimum ADF recommended in BS 8206[1]	Predicted ADF	Compliance Demonstrated
Third Floor	32	Bedroom 1	1.0	3.2	Yes
	32	Bedroom 2	1.0	2.8	Yes
	32	Living	1.5	1.5	Yes
	33	Bedroom 1	1.0	3.7	Yes
	33	Bedroom 2	1.0	3.6	Yes
	33	Living	1.5	1.7	Yes
	34	Bedroom 1	1.0	3.7	Yes
	34	Bedroom 2	1.0	3.8	Yes
	34	Living	1.5	1.5	Yes
	35	Bedroom 1	1.0	3.8	Yes
	35	Bedroom 2	1.0	2.2	Yes
	35	Living	1.5	1.7	Yes
	36	Bedroom 1	1.0	4.6	Yes
	36	Bedroom 2	1.0	2.9	Yes
	36	Living	1.5	2.7	Yes
	37	Bedroom 1	1.0	3.8	Yes
	37	Bedroom 2	1.0	3.8	Yes
	37	Living	1.5	1.5	Yes
	38	Bedroom 1	1.0	3.2	Yes
	38	Bedroom 2	1.0	4.0	Yes
	38	Living	1.5	1.6	Yes
	39	Bedroom 1	1.0	3.7	Yes
	39	Bedroom 2	1.0	3.8	Yes
	39	Living	1.5	1.5	Yes
	40	Bedroom 1	1.0	3.3	Yes
	40	Bedroom 2	1.0	4.0	Yes
	40	Living	1.5	1.6	Yes
	41	Bedroom 1	1.0	3.3	Yes
	41	Bedroom 2	1.0	3.8	Yes
	41	Living	1.5	2.1	Yes

Average Daylight Factor (ADF)					
Floor	Unit	Room	Minimum ADF recommended in BS 8206[1]	Predicted ADF	Compliance Demonstrated
Fourth Floor	42	Bedroom 1	1.0	7.2	Yes
	42	Bedroom 2	1.0	9.0	Yes
	42	Bedroom 3	1.0	2.3	Yes
	42	Living	1.5	11.2	Yes

[1] It is noted that BS 8206-2:2008: Lighting for buildings - Part 2: Code of practice for daylighting was recently replaced with BS EN 17037:2018 Daylight in Buildings. However, given that the Sustainable Urban Housing: Design Standards for New Apartments Guidelines for Planning Authorities refer to the BS 8206-2:2008 and not to BS EN 17037:2018, BS 8206:2008 has been referenced in the preparation of this report.

3. Conclusion

Average Daylight Factor (ADF)

Average daylight factor (ADF) is a measure of the adequacy of diffuse daylight within a room, and accounts for factors such as the size of a window in relation to the size of the room; the reflectance of the walls; and, the nature of the glazing and number of windows. Clearly a small room with a large window will be better illuminated by daylight than a large room with a small window, and the ADF measure accounts for this.

BRE guidelines confirm that the acceptable minimum ADF target value depends on the room use. That is 1% for a bedroom, 1.5% for a living room and 2% for a family kitchen. In cases where one room serves more than one purpose, the minimum ADF should be that for the room type with the higher value. Notwithstanding this, the independent daylight and sunlight review states that, in practice, the principal use of rooms designed as a 'living room/kitchen/dining room' is as a living room. Accordingly, it would be reasonable to apply a target of 1.5% to such rooms.

The proposed development at Larkfield House was assessed for ADF. All 130 spaces assessed meet or exceed the BRE guideline levels, so the proposed apartments are considered to provide an acceptable standard of amenity from a daylight perspective.

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