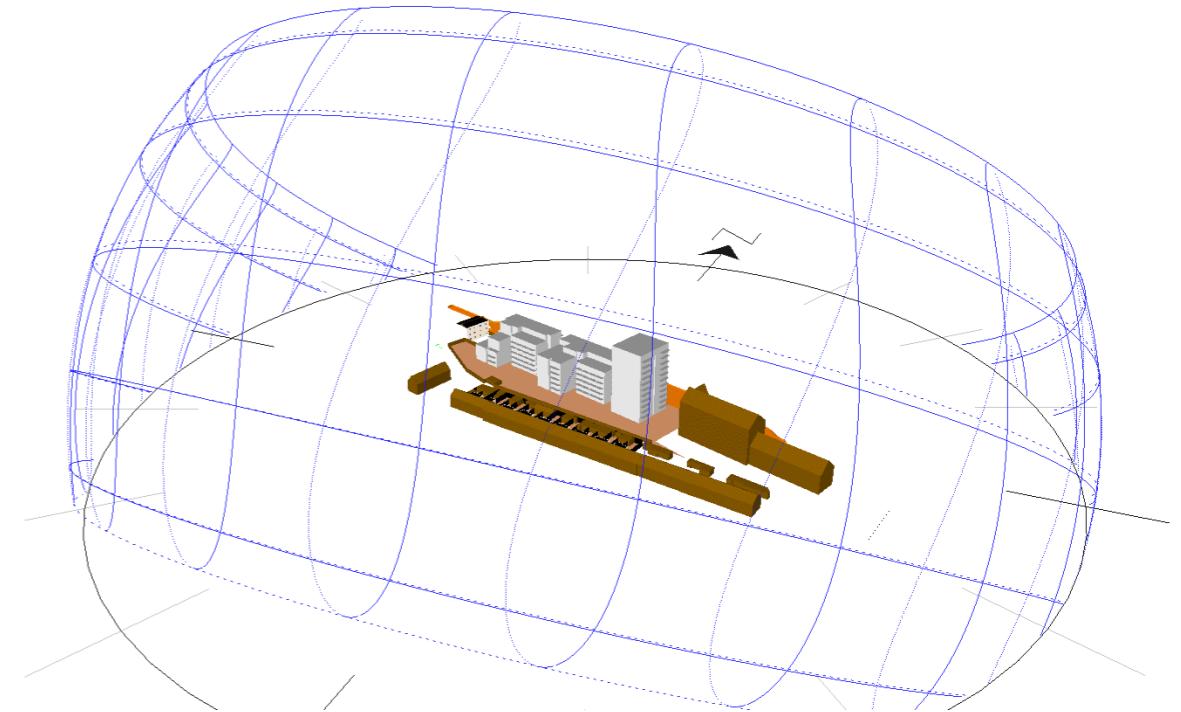


PROPOSED DEVELOPMENT AT CROSS GUNS BRIDGE PHIBSBOROUGH



Sunlight & Daylight Analysis
IN2 Project No. D2012
29/01/2021

Revision History

Date	Revision	Description
06/10/2020	00	Initial issue for review
07/12/2020	01	Revised review
29/01/2021	02	Formal Issue

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1.0 Executive Summary

This report complies analysis as carried out for Daylight and Sunlight for the proposed residential development at Cross Guns in Phibsborough.

The scheme has been designed specifically to take account of the potential for overshadowing and loss of light to neighbouring dwellings. The images in Fig 1.1 illustrate how the massing of the proposed scheme has evolved through an iterative process to ensure overshadowing is in line with BRE best practice guidelines.

Section 2.0 illustrates the results from the amenity sunlight analysis as undertaken based on the BRE best practice for garden amenities. Due to proposed massing and orientation the proposed amenity space was found to receive excellent sunlight availability with 98% of the amenity space receiving more than two hours of daylight on March 21st significantly more than the BRE minimum of 50%.

Section 3.0 illustrates the Daylight and Sunlight impact on neighbouring Buildings. The scheme has been designed with respect to the neighbouring environs. By siting the scheme at the northern edge of the site, availability of daylight, sunlight and the risk of overlooking have been mitigated. There is no impact of neighbouring dwellings as a result of the scheme based on the BRE guidance.

Section 4.0 illustrates the Internal Daylight Analysis. Internal daylight analysis has been undertaken for the units across the development. The analysis determined that 97% (411/422) of rooms were in excess of the BRE guidelines for average daylight factors (ADF). Additionally, the scheme has been designed to ensure that no living space achieves a daylight factor less than 1% nor a bedroom less than 0.7% ensuring no sub-quality daylit spaces are provided for the development.

The results determined an average ADF of 3.5% for all living / dining space across the development, with 50% (i.e. Median) of the living spaces achieving an ADF in excess of 3.5%, as illustrated in Figure 5.2.2. Similarly, the average daylight factor in the bedrooms across the scheme was in excess of 3.5%. Thereby comfortably exceeding minimum requirements and indicative of the overall excellent quality of daylight designed for the Residential Units throughout the Proposed Development, ensuring an enhanced environment can be provided whilst minimising lighting energy usage.

We note the BRE guide should be seen as advisory only, as the guide was developed for low density urban housing, and was developed to inform design rather than to constrain it. Although the guide provides numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design.

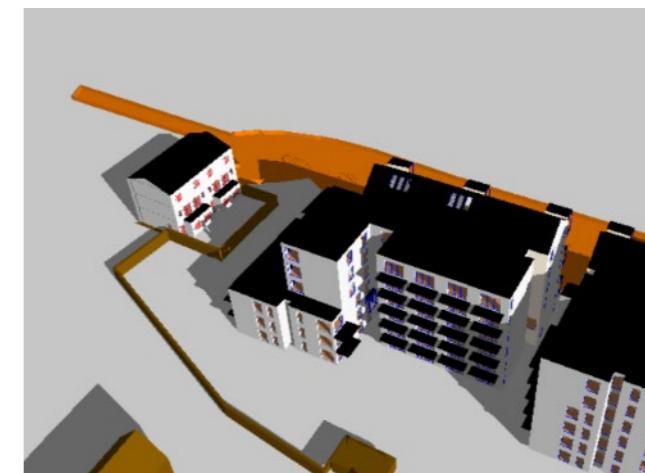
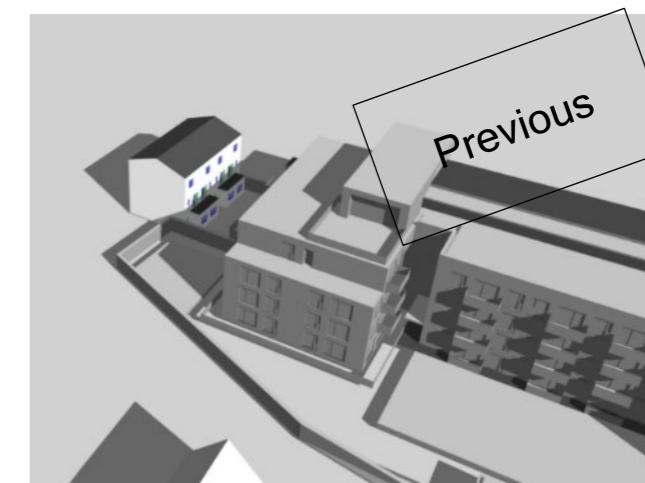
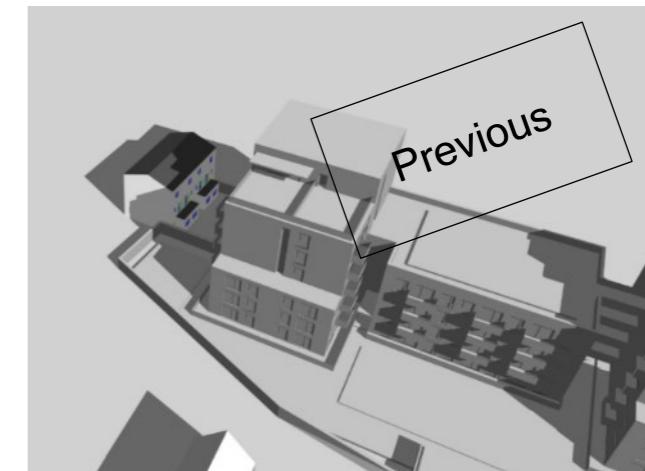


Fig 1.1 -3D models, Design Development Process

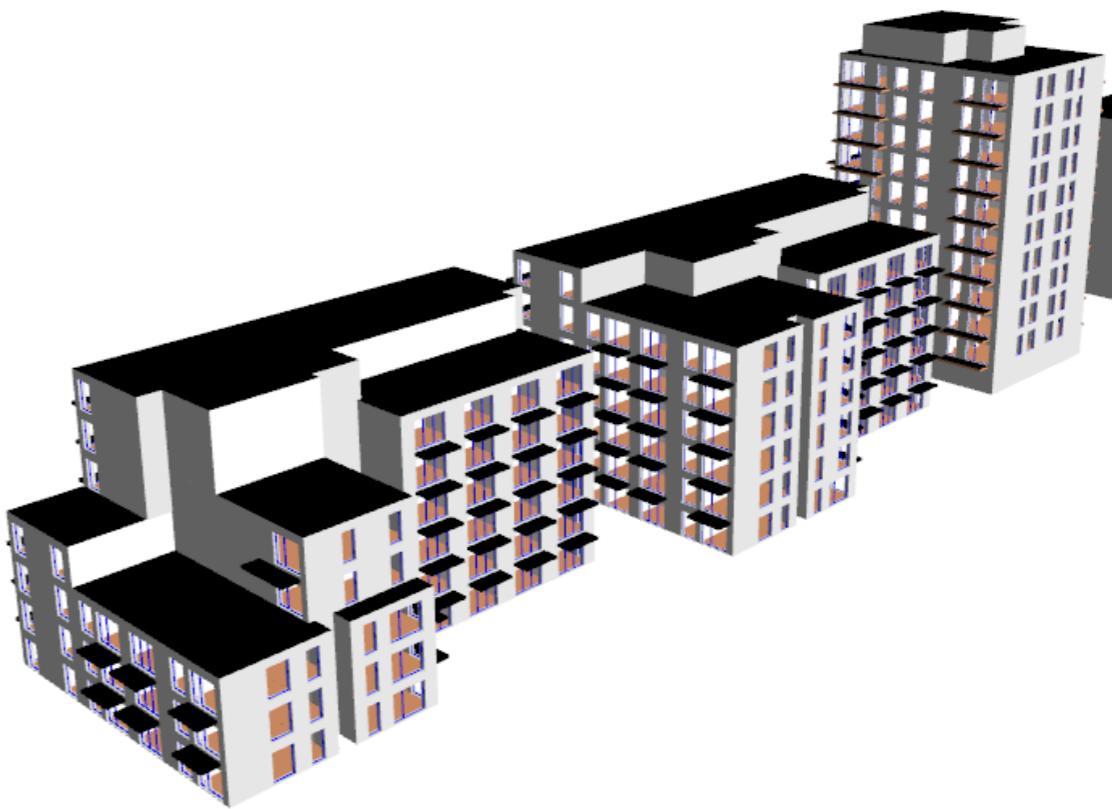
2.0 Development Overview

Bindford Ltd intend to apply to An Bord Pleanála for permission for a strategic housing development at this site, Cross Guns Bridge, Phibsborough, Dublin 7.

The proposal is for a Strategic Housing Development for Build -To-Rent apartments and will comprise the demolition of all derelict buildings on site and the construction of a new residential development comprising 3 no. blocks ranging in height up to 12 storeys consisting of 205 no. dwellings and associated residential amenities, basement and surface carparking with vehicular and pedestrian access from the eastern end of the site off Phibsborough Road. Additional pedestrian only accesses to the north of the site off the Royal Canal Way.

A new café/ retail area will be located at ground floor level of block C along with a new public open space to the east of the site. All associated site development works, landscaping and boundary treatment, children's play area, cycle parking, bin stores, substation, and services provision.

A full description is set out in the statutory notices.



3.0 Sight Sunlighting and Shading

3.1 Methodology

The BRE Site Layout Planning for Daylight and Sunlight Design Guide 209 provides guidance with regards to sunlighting and shading to external Amenity spaces within proposed developments.

The guidance recommends “that for it to appear adequately sunlit throughout the year, at least half of a garden or amenity area should receive at least two hours of sunlight on 21st March”.

The methodology assesses sunlight performance at the Equinox, as this is the mid solar position throughout the year (as illustrated in Fig.3.1), with compliance indicative of spaces that will receive adequate sunlight and appealing useful spaces, including that the following attributes will be achieved as identified in BRE.209:

- Provide attractive sunlit views (all year)
- Make Outdoor Activities like sitting out and children’s play more pleasant (mainly warmer months).
- Encourage plant growth (mainly spring and summer).
- Dry out the ground, reducing moss and slime (mainly in colder months).

An example analysis of Amenity Spaces is indicated in Figure 3.1. In this development, the main amenity space (to right hand side) is located to the North of a building block which provides some degree of overshadowing (dark green contours).

However, as the majority of the Amenity Space was determined to be able to receive at least 2 hours of sunlight at the Equinox (light green contours), this would be deemed to be compliant.

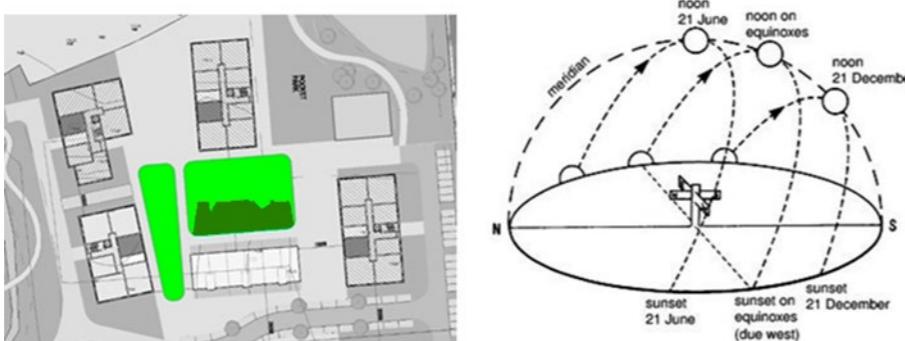


Fig 3.1 – Example Amenity Spaces

3.2 Methodology

Fig 3.2 confirms, due to building orientation, the vast majority of potential amenity spaces within the Cross Guns development, well above the recommended 50%, will be compliant with 98% meeting the criterion.



Fig 3.2 –Sunlight Availity to Amenity Spaces for Proposed Development

4.0 Daylight and Sunlight Impact on Neighbouring Buildings

The industry best practice guideline for daylight and sunlight is the BRE publication "Site Layout Planning for Daylight and Sunlight – A guide to good Practice (Second Edition)"

BRE Guidelines state:

Light from the Sky

"If any part of a new building or extension, measured in a vertical section perpendicular to a main window wall of an existing building, from the centre of the lowest window, subtends an angle of more than 25° to the horizontal, then the diffuse daylighting of the existing building may be adversely affected. This will be the case if either:

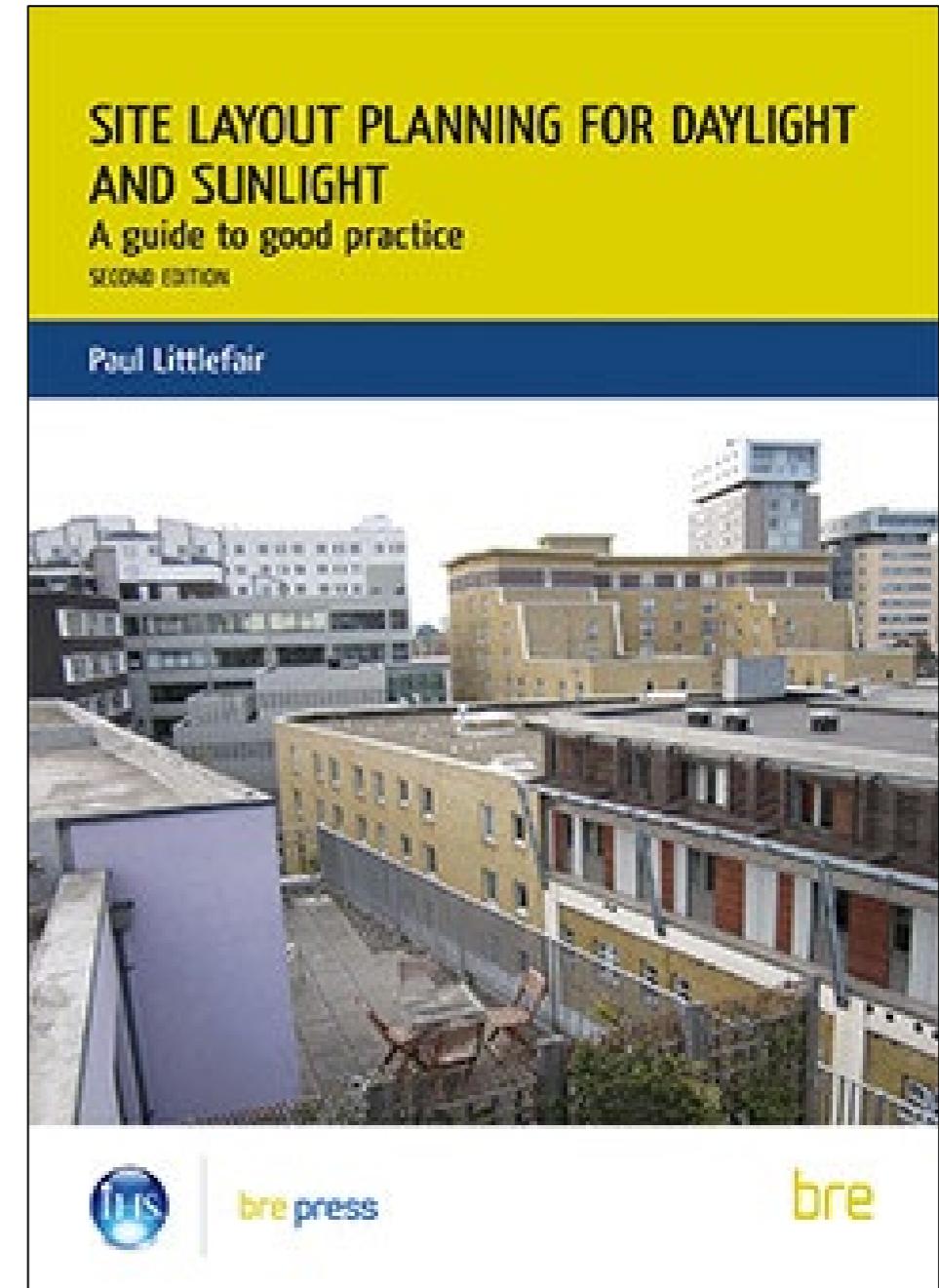
- *The VSC (Vertical Sky Component) measured at the centre of an existing main window is less than 27%, and less than 0.8 times its former value*

The analysis is based on measuring the VSC at the existing main windows. Main windows included, living rooms, kitchens, and bedrooms.

Sunlighting

If a living room of an existing dwelling has a main window facing within 90° of due south, *and any part of a new development subtends an angle of more than 25° to the horizontal measured from the centre of the window in a vertical section perpendicular to the window, then the sunlighting of the existing dwelling may be adversely affected. This will be the case if the centre of the window:*

- *receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between 21 September and 21 March and*
- *receives less than 0.8 times its former sunlight hours during either period and*
- *has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.*



4.1 Neighbouring Building 3D Modelling

A 3D model (including environs) was created for both existing conditions and proposed. Window locations were determined (where possible) from Google Maps.

The following neighbourhood buildings were assessed.

- 1-8 Shandon Mill, Cabra East 
- 25-57 Leinster Street N (Odd Numbers) 

As window use is unknown for houses on Leinster Street, and to allow for worst case assessment, an individual 1m² window in the centre of the wall facing the development was assessed.



Fig 4.1.1 – Numbers 1-8 Shandon Mill



Fig 4.1.2 –Odd Numbers Between 25-57 Leinster St N

4.2 Results – Daylighting

Analysis determines that whilst proposed VSC to house of Leinster Street were below 27% VSC, this does not represent less than 80% of their previous (existing) condition. Conversely, units on Shandon Mill all receive a VSC of greater than 27% for the proposed condition. Therefore all windows were found to be compliant with the BRE guidance.

Building Ref	Orientation	VSC Existing (%)	VSC Proposed (%)	Proposed/Existing
Leinster St No. 57	11	21.27	19.78	0.93
Leinster St No. 55	12	24.21	22.54	0.93
Leinster St No. 53	10	21.71	21.51	0.99
Leinster St No. 51	12	25.14	22.24	0.88
Leinster St No. 49	12	25.04	21.86	0.87
Leinster St No. 47	12	24.93	21.14	0.85
Leinster St No. 45	12	24.65	21.32	0.86
Leinster St No. 43	12	23.25	20.21	0.87
Leinster St No. 41	12	23.68	20.96	0.88
Leinster St No. 39	11	22.05	19.63	0.89
Leinster St No. 37	13	22.76	19.34	0.85
Leinster St No. 35	13	21.14	18.7	0.88
Leinster St No. 33	12	20.15	17.62	0.87
Leinster St No. 31	11	20.55	18.24	0.89
Leinster St No. 29	14	20.35	17.84	0.88
Leinster St No. 27	14	21.51	19.43	0.9
Leinster St No. 25	13	20.16	18.3	0.91
Shandon Mill No. 1	112	32.8	27.08	0.83
Shandon Mill No. 3	112	36.39	29.55	0.81
Shandon Mill No. 5	112	36.17	28.83	0.8
Shandon Mill No. 7	112	34.54	27.09	0.78
Shandon Mill No. 2 Fl 1	112	37.77	33.11	0.88
Shandon Mill No. 4 Fl 1	112	37.73	32.32	0.86
Shandon Mill No. 6 Fl 1	112	37.99	31.72	0.83
Shandon Mill No. 8 Fl 1	112	37.79	31.13	0.82
Shandon Mill No. 2 Fl 2	112	38.24	34.33	0.9
Shandon Mill No. 4 Fl 2	112	38.37	33.72	0.88
Shandon Mill No. 6 Fl 2	112	38.44	33.59	0.87
Shandon Mill No. 8 Fl 2	112	38.33	33.37	0.87

4.3 Results – Sunlighting

As the neighbouring houses receive sufficient available annual and winter sunlight percentages in excess of 25% and 5% respectively, the analysis indicates all houses assessed for sunlight impact achieve compliance with BRE recommendations and are not adversely affected by the proposed new development.

It should be noted that only windows within 90° of south are assessed therefore Leinster Street house were not assessed.

Building Ref:	Annual Sunlight Existing (%)	Annual Sunlight Proposed (%)	Proposed/ Existing	Winter Sunlight Existing (%)	Winter Sunlight Proposed (%)	Proposed/ Existing	Total Potential Annual Sunny Hours	Room Annual Existing (%)	Room Annual Proposed (%)	Room Winter Existing (%)	Room Winter Proposed (%)
No. 1	59	48	0.81	22	15	0.65	1277	59	48	22	15
No. 3	64	51	0.8	23	16	0.71	1277	64	51	23	16
No. 5	64	49	0.76	23	17	0.74	1277	64	49	23	17
No. 7	54	40	0.74	13	10	0.75	1277	54	40	13	10
No. 2 Fl 1	65	57	0.87	23	17	0.72	1277	65	57	23	17
No. 4 Fl 1	65	55	0.85	23	17	0.75	1277	65	55	23	17
No. 6 Fl 1	66	53	0.81	24	18	0.77	1277	66	53	24	18
No. 8 Fl 1	66	55	0.84	24	21	0.86	1277	66	55	24	21
No. 2 Fl 2	66	59	0.89	24	18	0.74	1277	66	59	24	18
No. 4 Fl 2	66	59	0.9	24	20	0.84	1277	66	59	24	20
No. 6 Fl 2	66	59	0.89	24	21	0.87	1277	66	59	24	21
No. 8 Fl 2	66	58	0.88	24	22	0.89	1277	66	58	24	22

5.0 Internal Daylight Analysis

5.1 Methodology

Daylighting analysis was undertaken for the proposed Residential development using Tas Dynamic Simulation Modelling (DSM) to determine Average Daylight Factors (ADF's) in accordance with BS.8206-2:2008 Code of Practice for Daylighting, as required for Sustainable Urban Housing: Design Standards for New Apartments-Guidelines for Planning Authorities.

ADF's were determined for a CIE Overcast Sky equivalent to providing an external, unobstructed illumination level of 10,000 Lux. CIE Overcast skies are theoretical sky models, with brightness highest at the zenith and reducing to the horizon, but also unidirectional (as illustrated in Figure 5.1.1), therefore ADF's do not differ for façade orientation, with North facing rooms achieving identical metric performance to South facing, all else being equal, with results accounting for diffuse natural light excluding any direct sunlight effects.

The daylight analysis accounted for all aspects that can potentially restrict natural light availability including adjacent buildings, along with explicitly modelling Building Details as indicated in Figure 5.1.2 such as balcony structures, window frames, reveal and cill depth etc. in accordance with the architectural design drawings.

The daylighting models were calculated based on the following assumptions regarding transmittance and reflectance (based on measured manufacturer's test data):

Glazing Transmission = 70%

Glazing Transmission with perforated screens = 35%

Ceilings: 82% reflectance (BS 00E55 White)

Walls: 62% reflectance (BS 10C31 Ivory)

Floors: 36% reflectance (BS 00A05 Platinum Grey)

Daylight Factors for each space were then calculated for a working plane height of 0.85m on a 0.1 x 0.1m grid basis to enable a detailed calculation within each room, the average of which was then determined to calculate ADF.

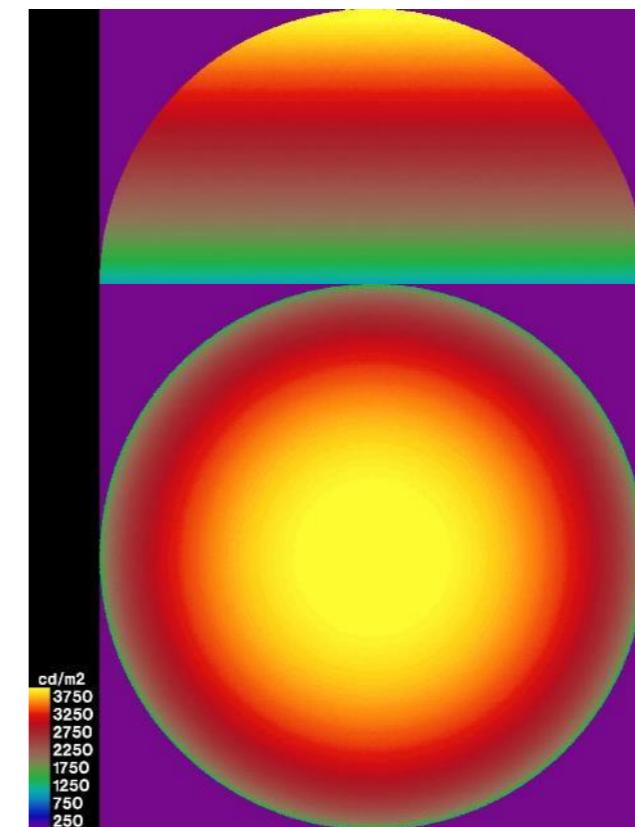


Fig 5.1.1 - CIE Overcast sky as viewed in elevation and from below

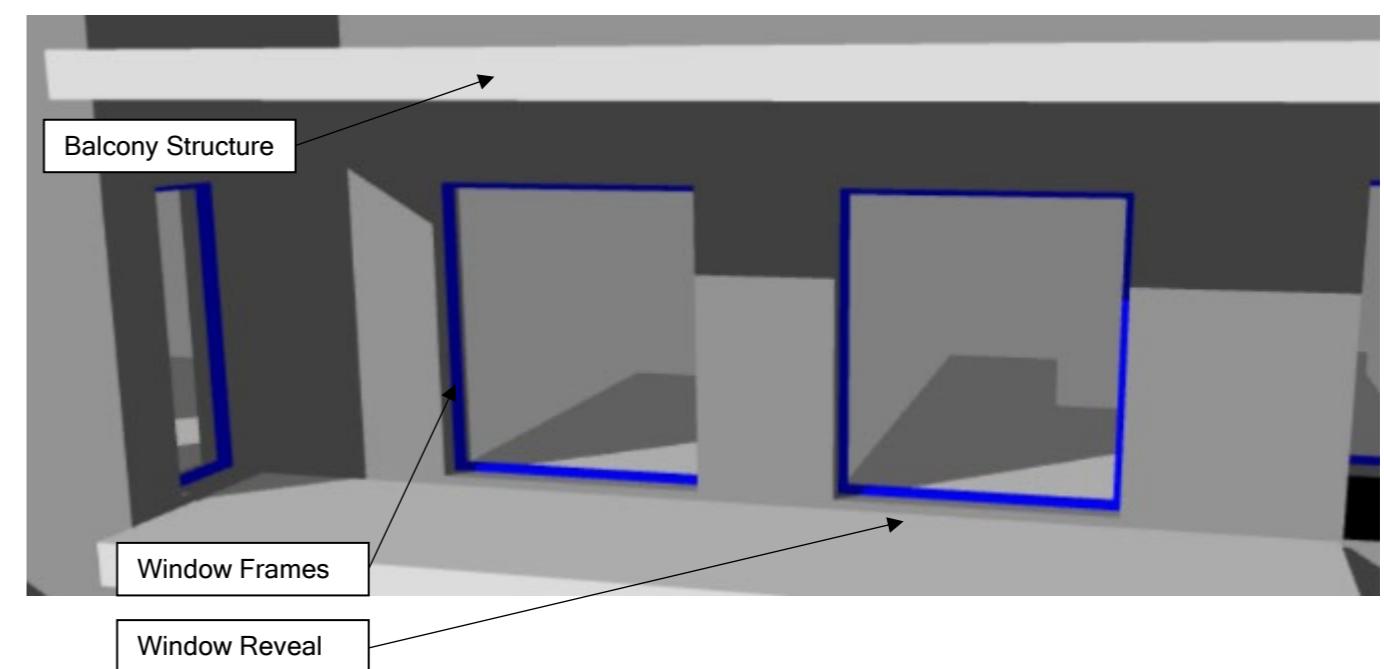


Fig 5.1.2 – Building Details included within Daylight Analysis

5.2 Results Summary

Figure 5.2.1 indicates the overall summary of ADF's determined for the Proposed Development, at each floor level. It can be seen that 97% of Living/ Dining and Bedrooms assessed (totalling 411 of 422 rooms) were determined to be compliant based on the following compliance, in accordance with BS.8206-2: 7

- > 1.5% for Living/ Dining Areas
- > 1.0% for Bedrooms

It may be noted that for the purpose of analysis, and as per accepted practice, the Kitchenettes to Apartments have been excluded as these types of galley kitchens do not provide dining/sitting area. The associated requirement within BS.8206-2 for "Kitchens" (ADF>2.0%) was developed for residential housing where the kitchen would be an identifiable separate room with seating and where occupants would be expected to eat and spend time as well as being generally present throughout the day.

The Apartments assessed do not include a kitchen of this type; they instead include a kitchenette which would be expected to be used solely to prepare food with the residents spending most of their time in the Living area. We therefore assessed each Living/ Dining Area in its entirety, with Daylighting deemed compliant only where the combined space of these was found to achieve at least 1.5% ADF.

We note the BRE guide should be seen as advisory only as the guide was developed for low density urban housing and was developed to inform design rather than to constrain it. Although the guide provides numerical guidelines, it notes that these should be interpreted flexibly since natural lighting is only one of many factors in site layout design.

However, aside from meeting minimum requirements, many Living/ Dining Areas and Bedrooms were determined to receive Daylighting comfortably exceeding these ADF targets, with the range of performance assessed below.

The results determined an average ADF of 3.5% for all living / dining space across the development, with 50% (i.e. Median) of the living spaces achieving an ADF in excess of 3.5%, as illustrated in Figure 5.2.2. Similarly, the average daylight factor in the bedrooms across the scheme was in excess of 3.5%. Thereby comfortably exceeding minimum requirements and indicative of the overall excellent quality of daylight designed for the Residential Units throughout the Proposed Development, ensuring an enhanced environment can be provided whilst minimising lighting energy usage.

	Pass	Fail	Total
Level 00	46	4	50
Floor 01	57	5	62
Floor 02	60	2	62
Floor 03	57	0	57
Floor 04	55	0	55
Floor 05	52	0	52
Floor 06	36	0	36
Floor 07	12	0	12
Floor 08	12	0	12
Floor 09	12	0	12
Floor 10	12	0	12
Total	411	11	422
Percentage	97%	3%	

Fig 5.2.1 – Daylight Summary

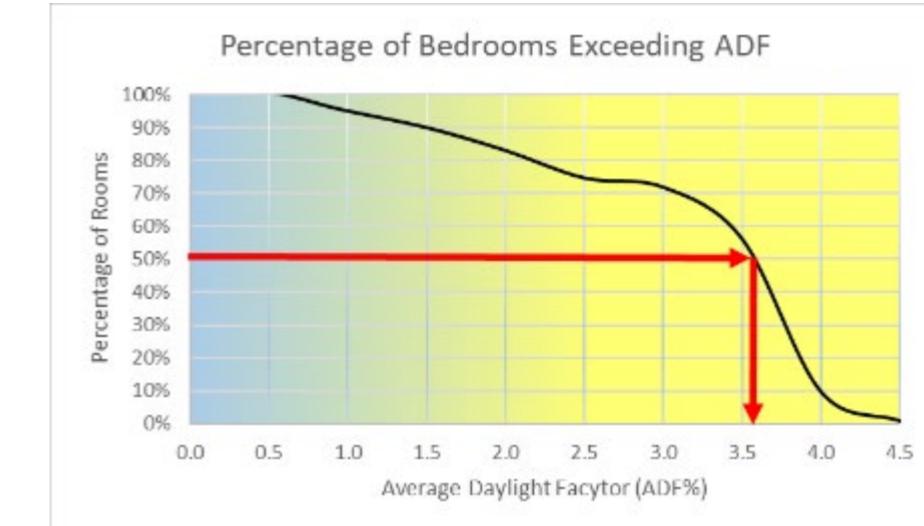
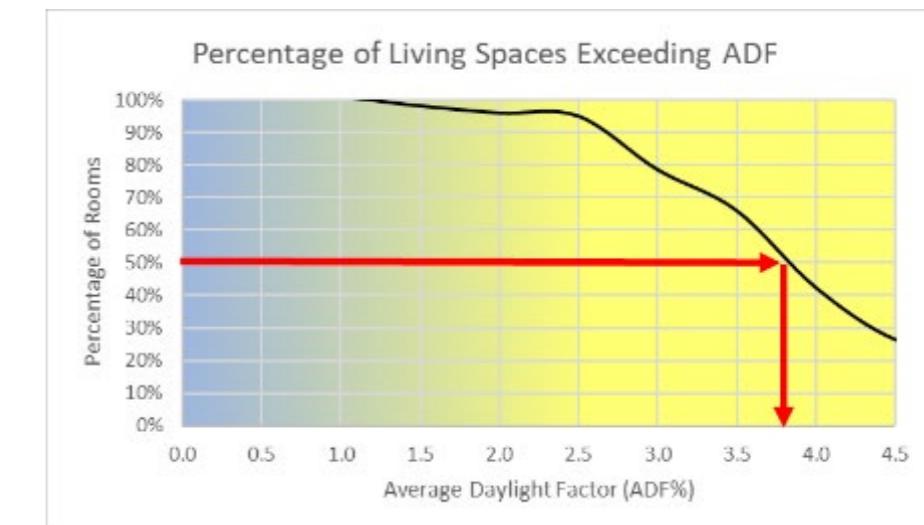
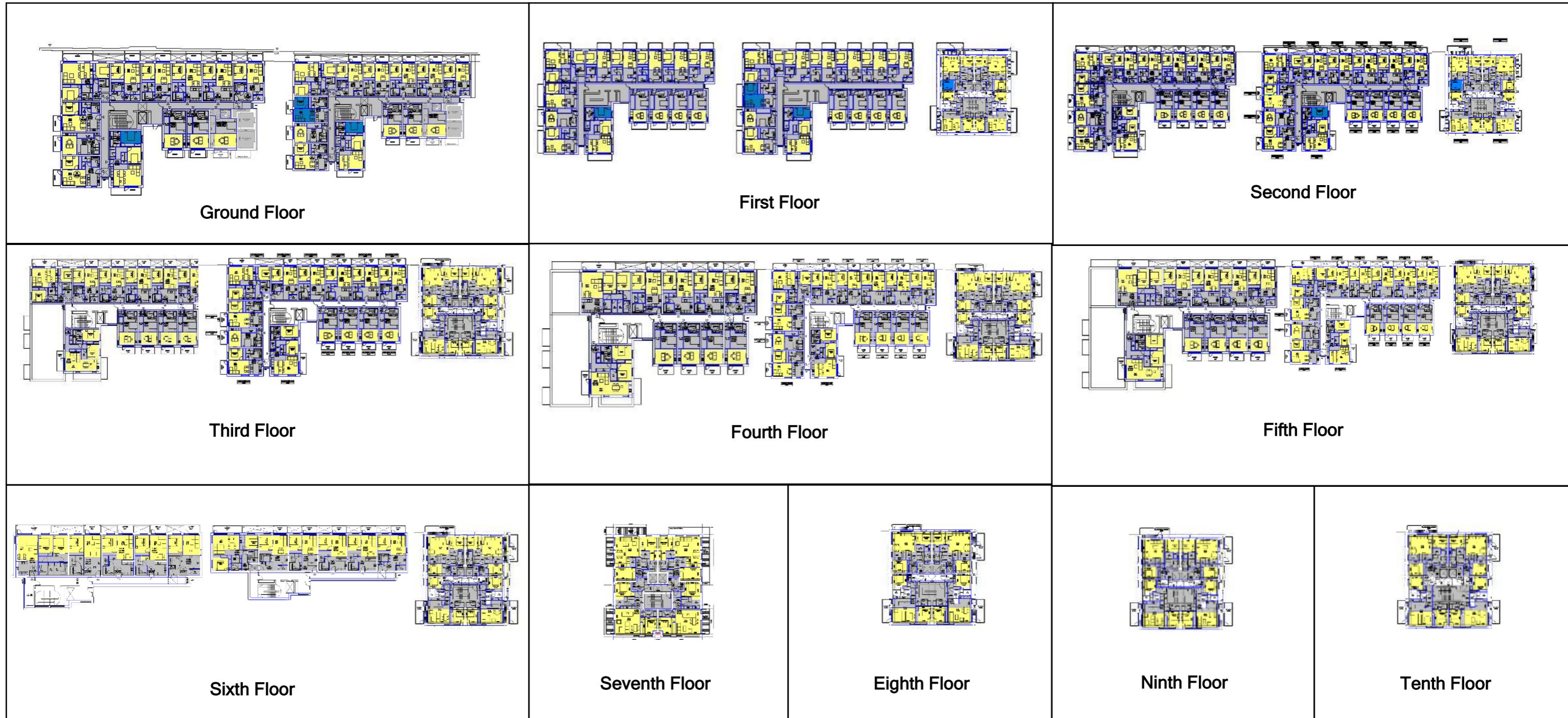


Fig 5.2.2 – Daylight Summary

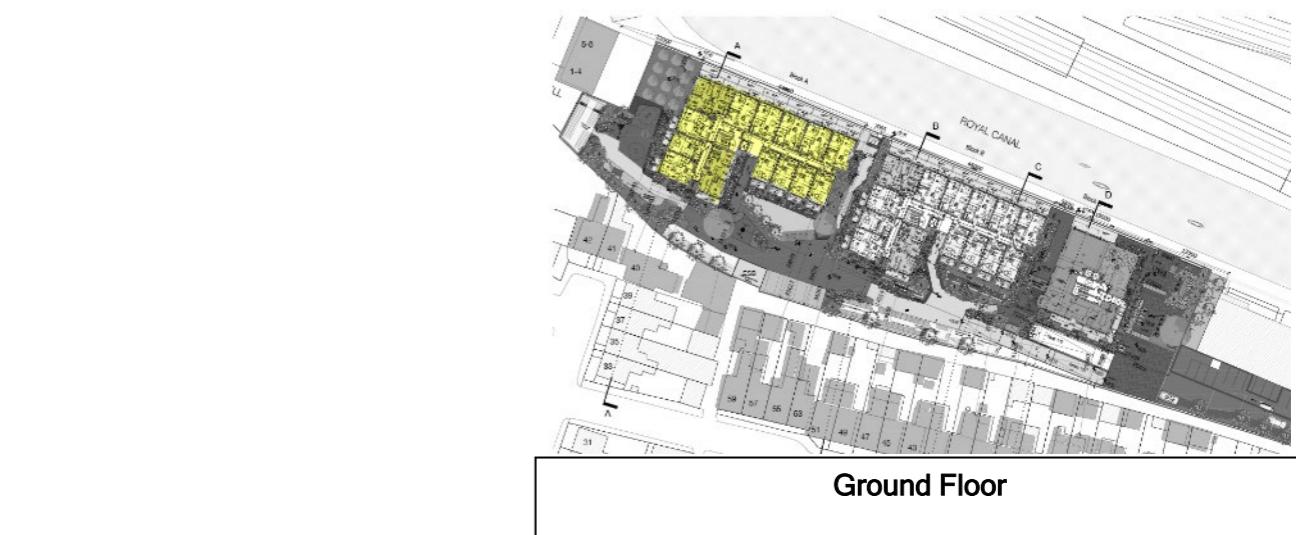
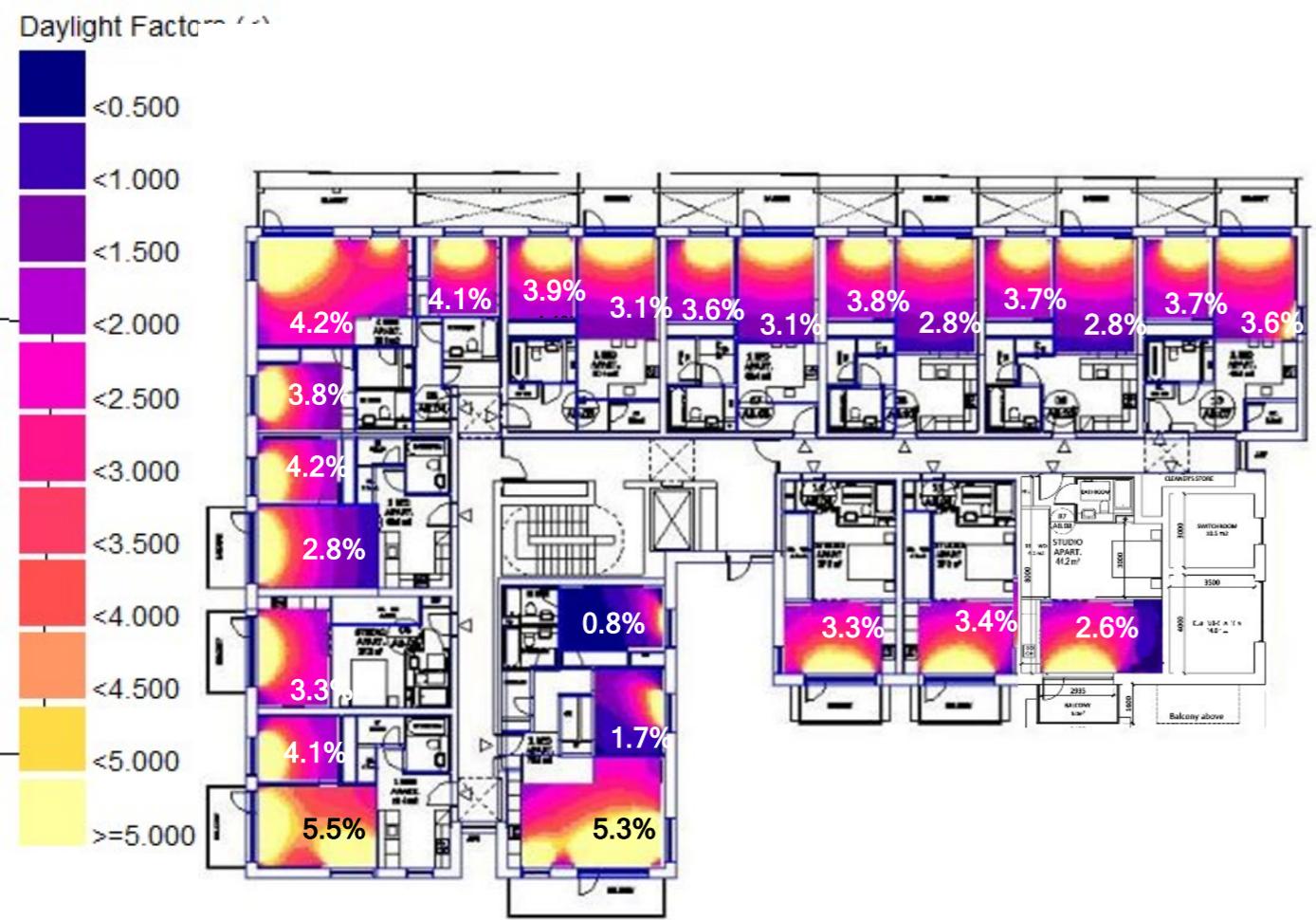
5.3 Results

The results determined 97% of all spaces exceeded BRE criteria.



5.4 Ground Floor Results – Block A

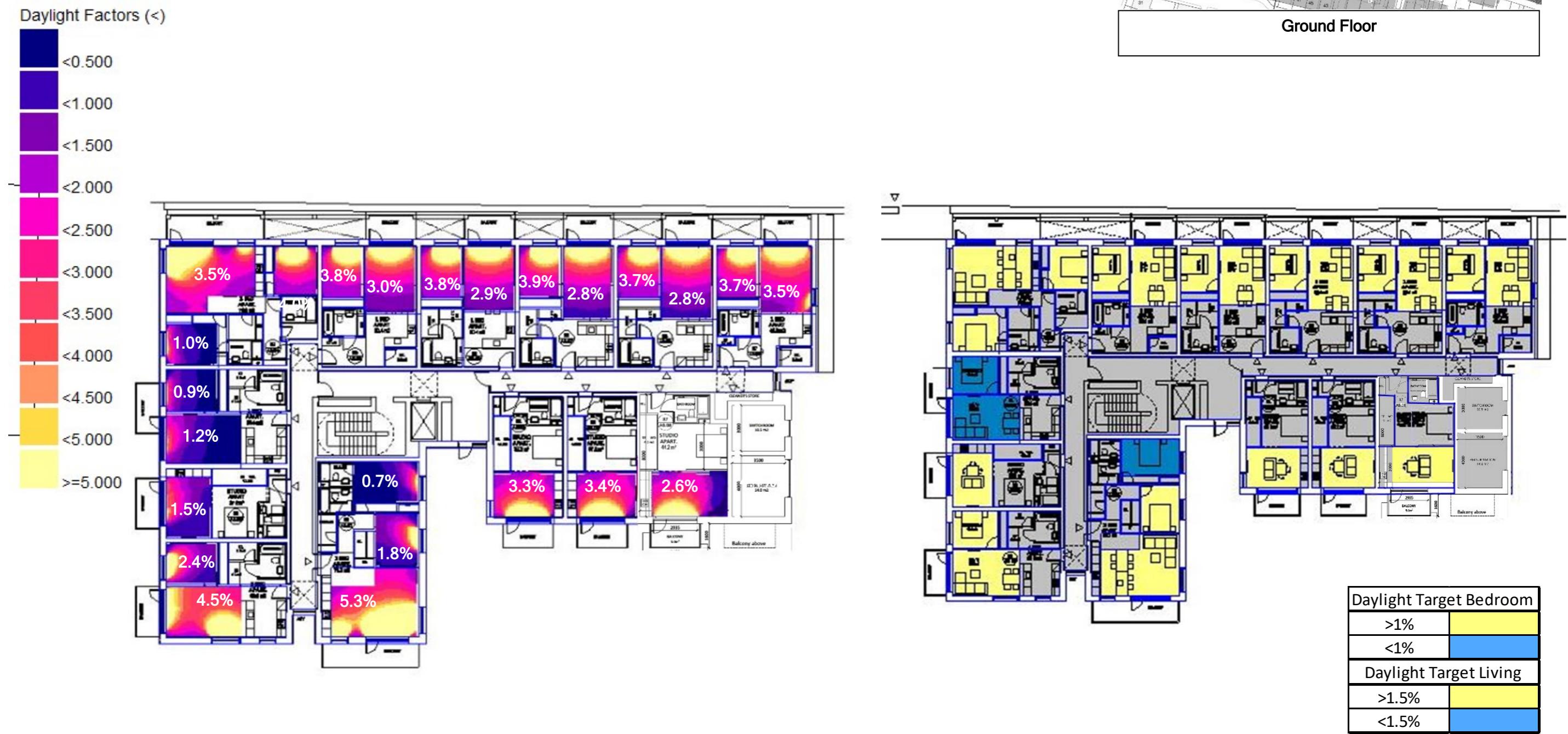
Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). 23 of 24 rooms exceed the BRE guidelines on the ground floor.



Daylight Target Bedroom	
>1%	Yellow
<1%	Blue
Daylight Target Living	
>1.5%	Yellow
<1.5%	Blue

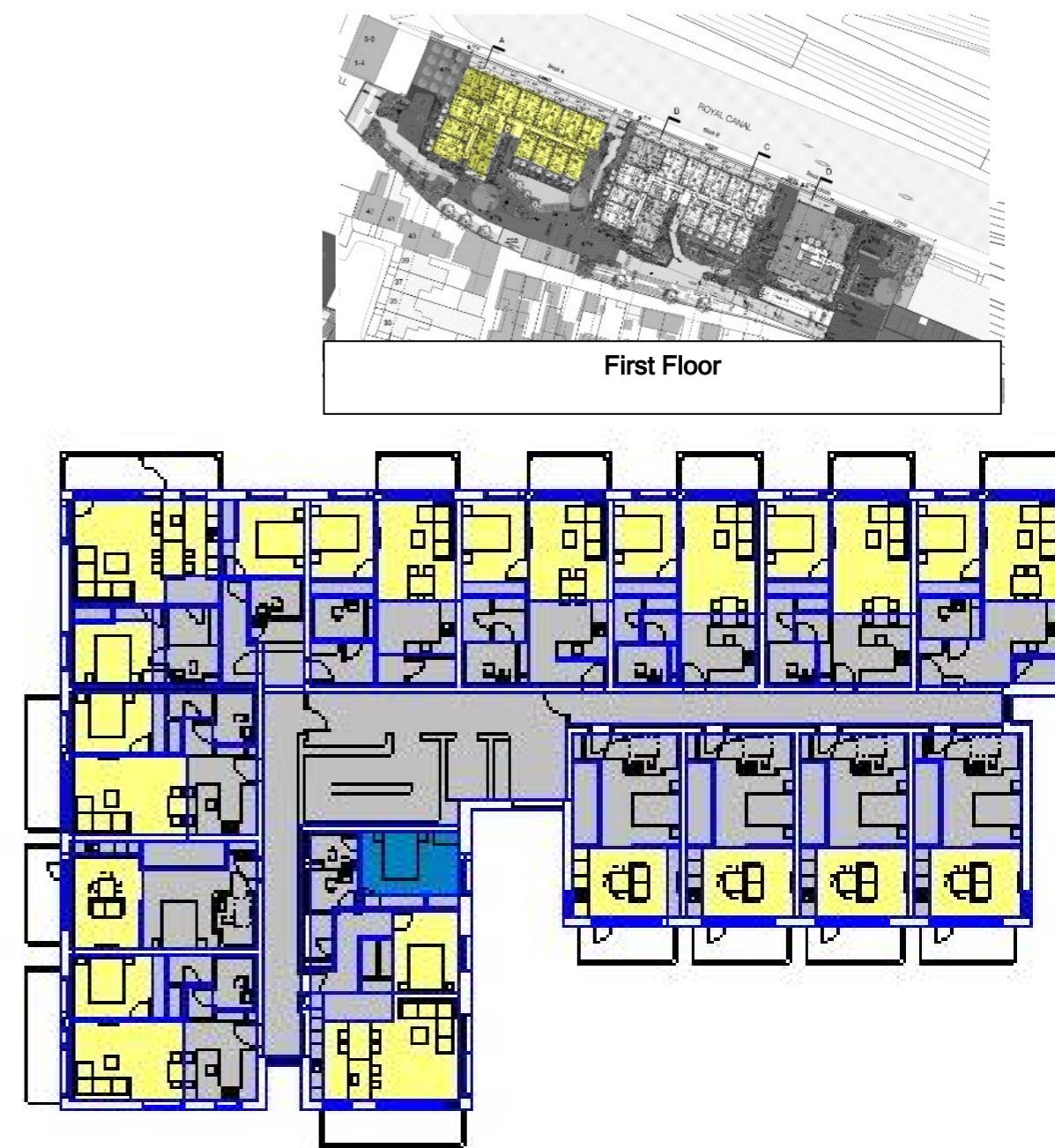
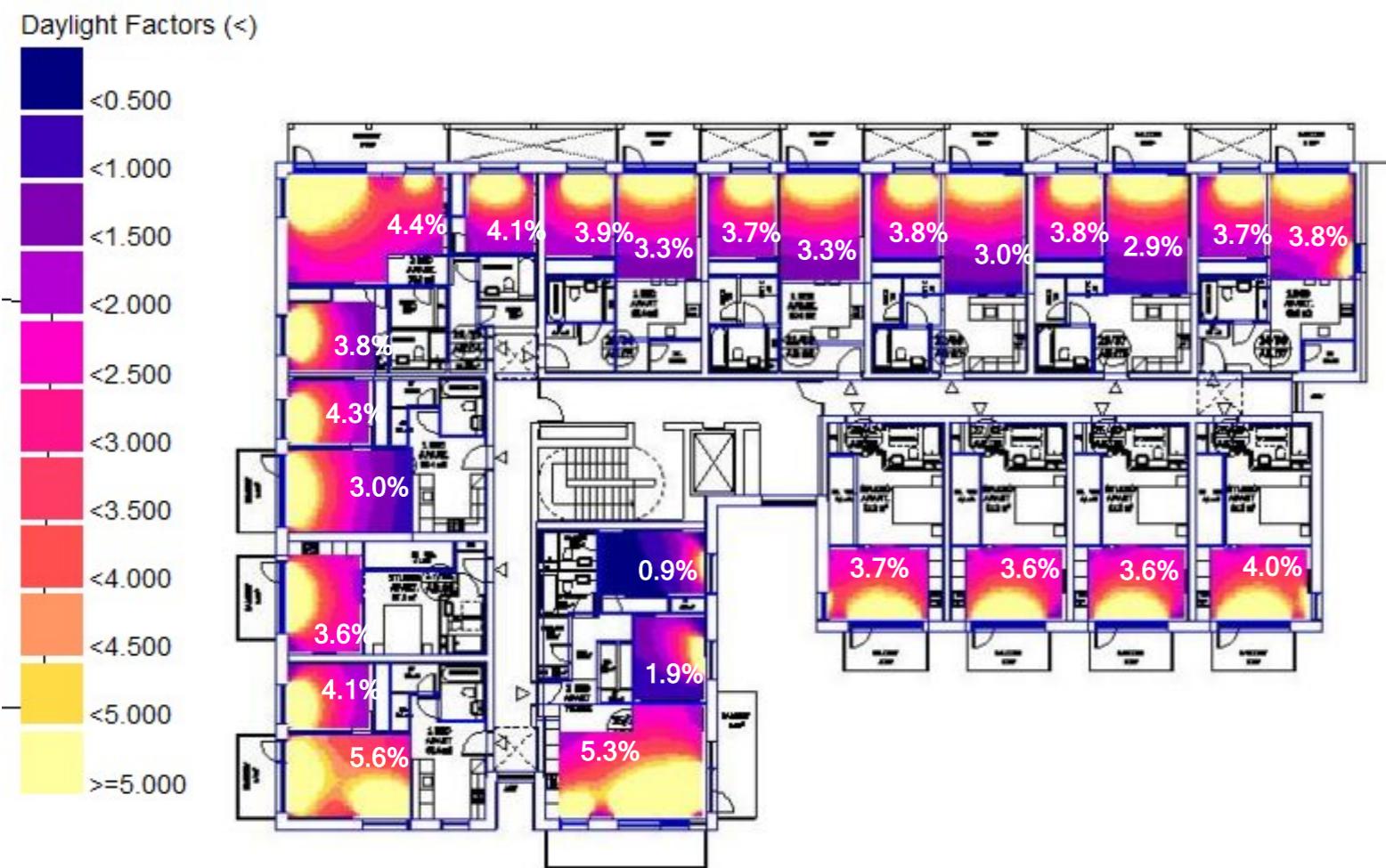
5.5 Ground Floor Results – Block B

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). 21 of 24 rooms exceed the BRE guidelines on the ground floor.



5.6 First Floor Results – Block A

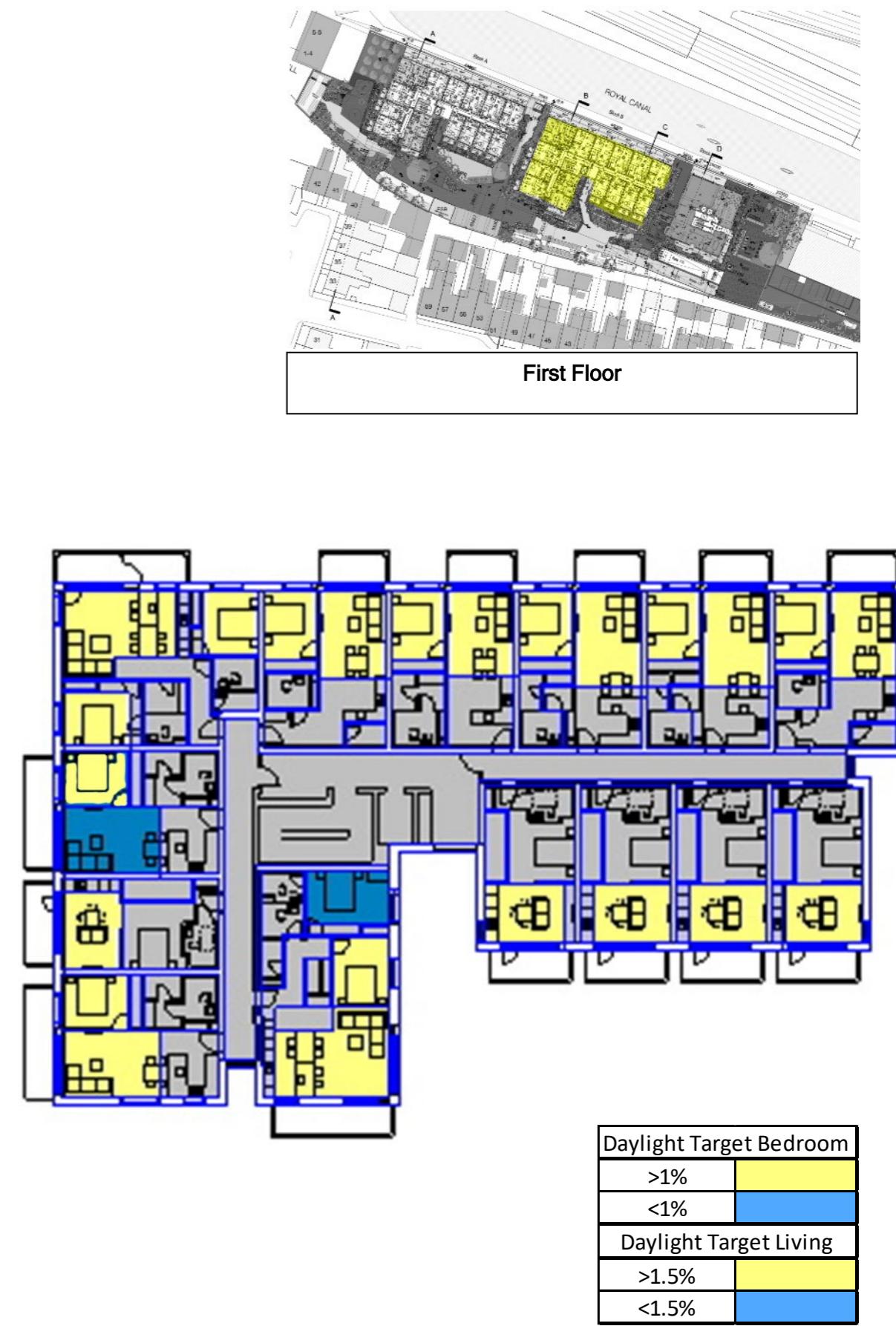
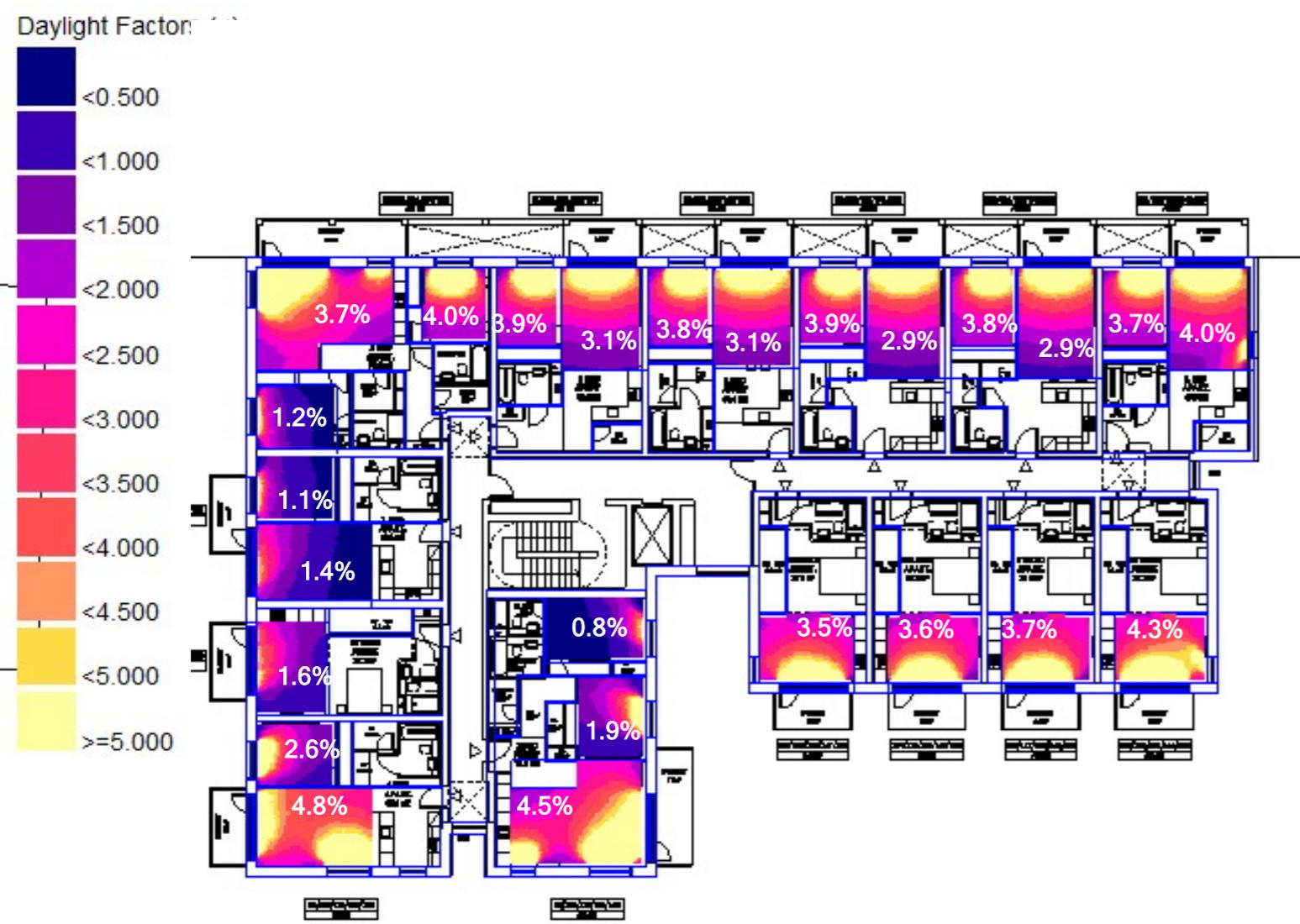
Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). 24 of 25 rooms exceed the BRE guidelines on the first floor.



Daylight Target Bedroom	>1%	<1%
Daylight Target Living	>1.5%	<1.5%

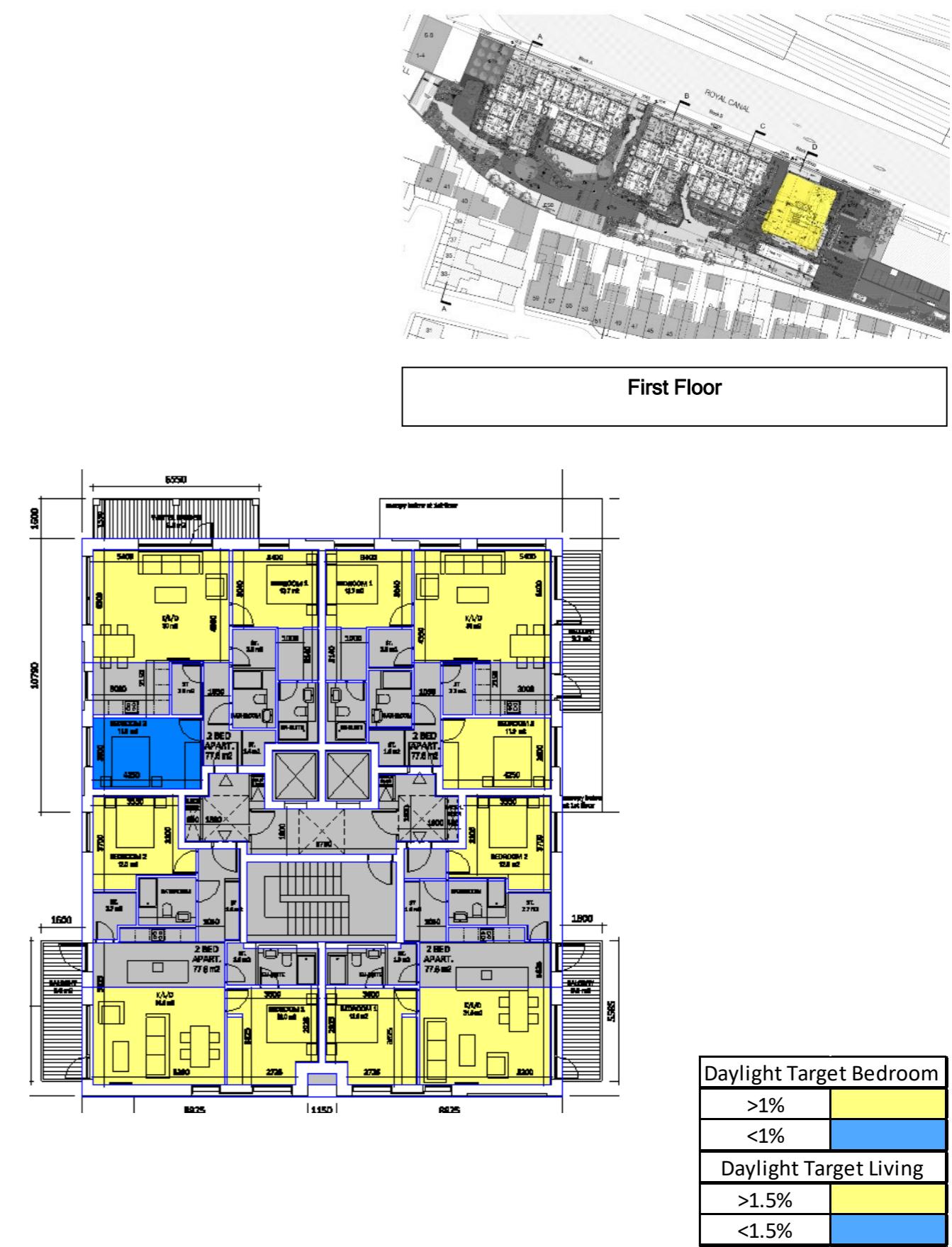
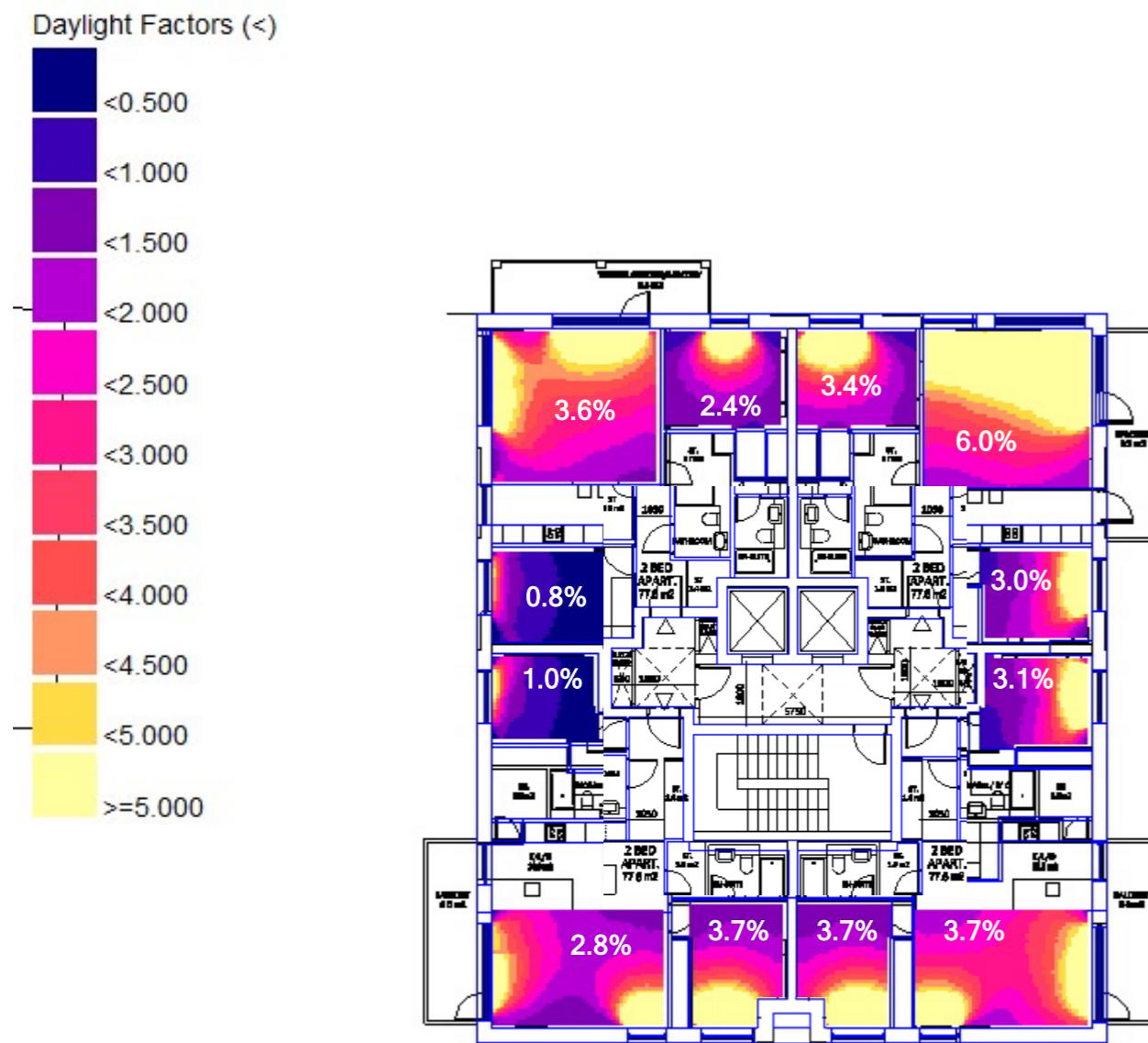
5.7 First Floor Results – Block B

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). 23 of 25 rooms exceed the BRE guidelines on the first floor.



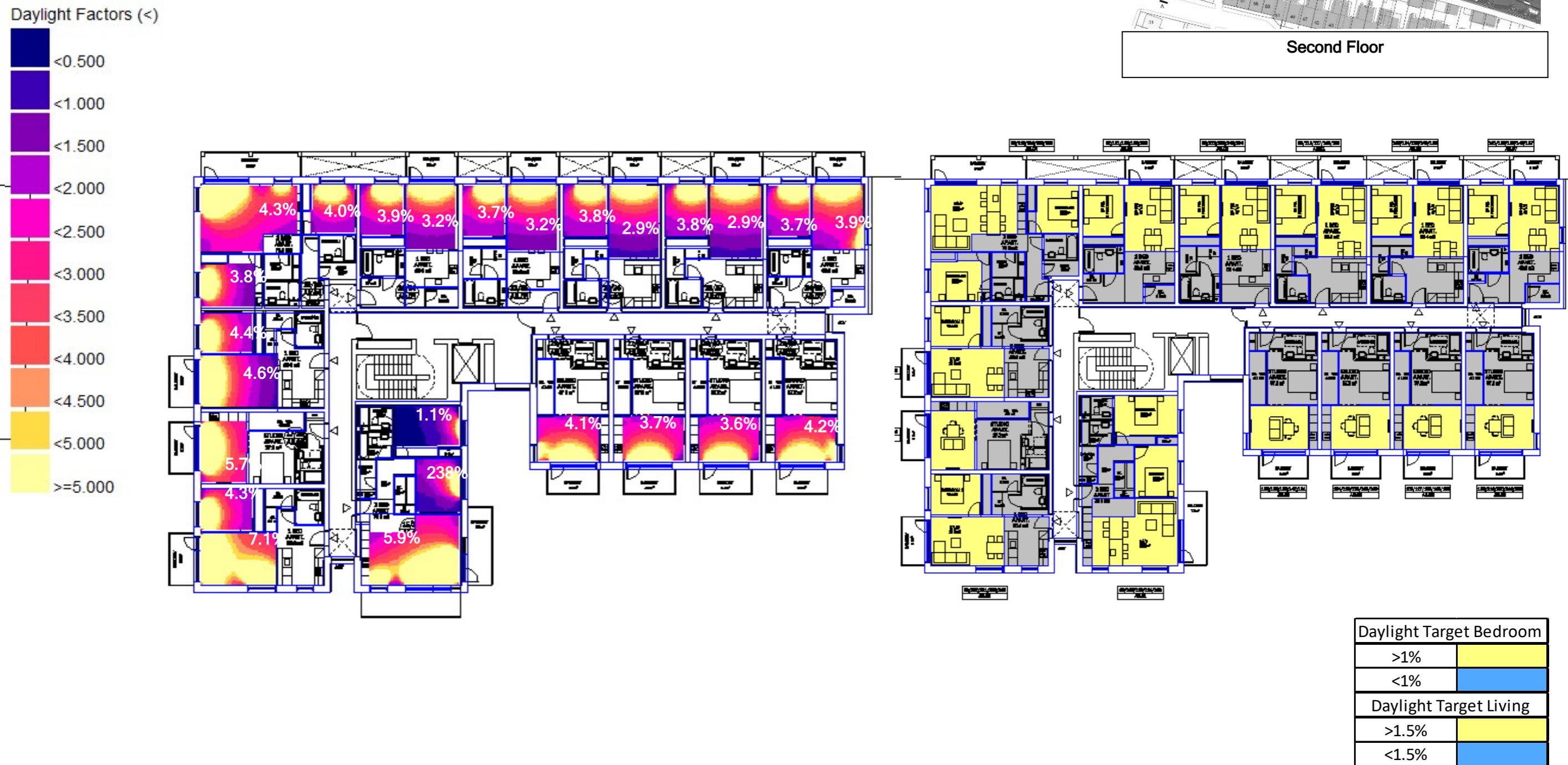
5.8 First Floor Results – Block C

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). 11 of 12 rooms exceed the BRE guidelines on the first floor.



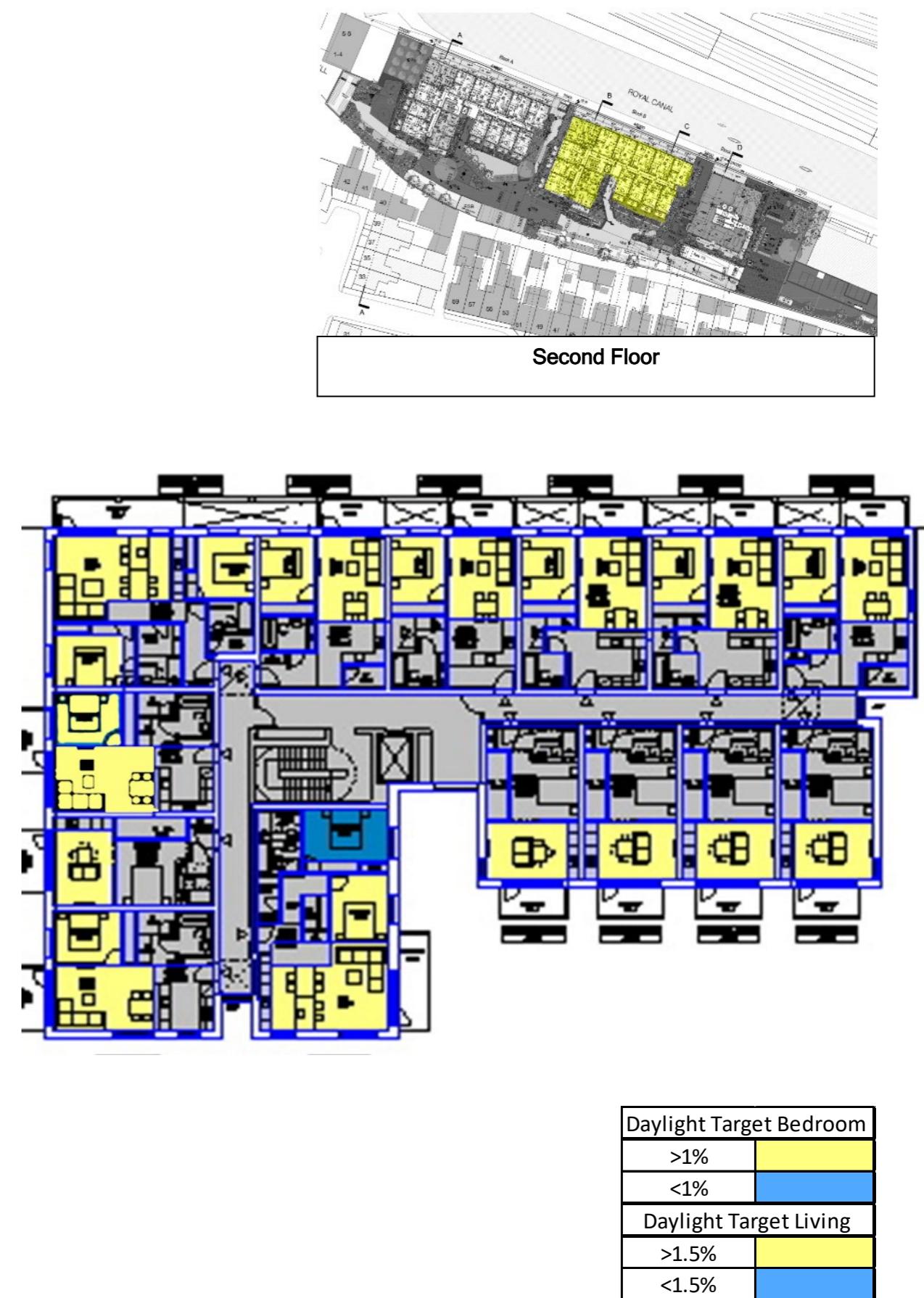
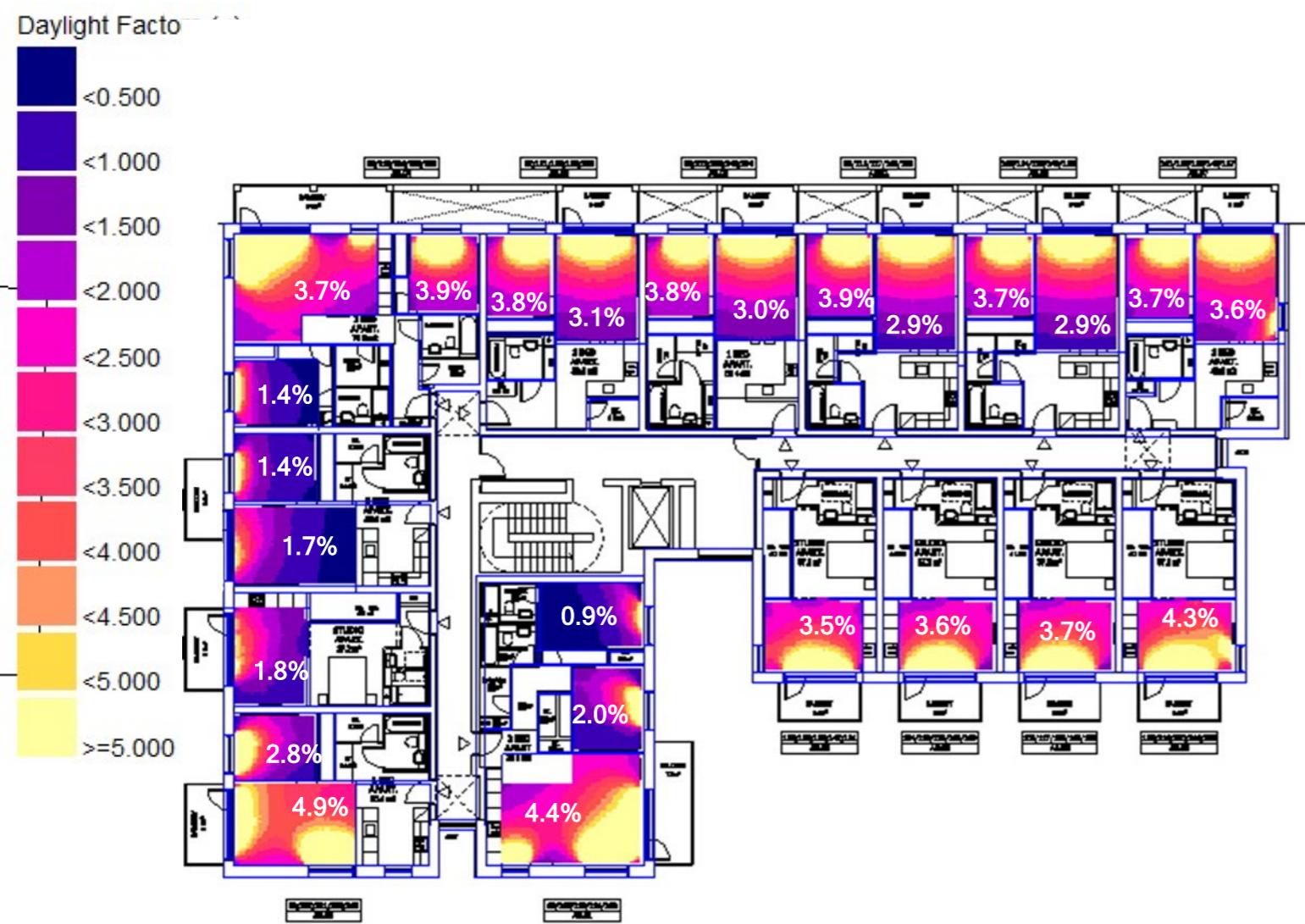
5.9 Second Floor Results – Block A

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines.



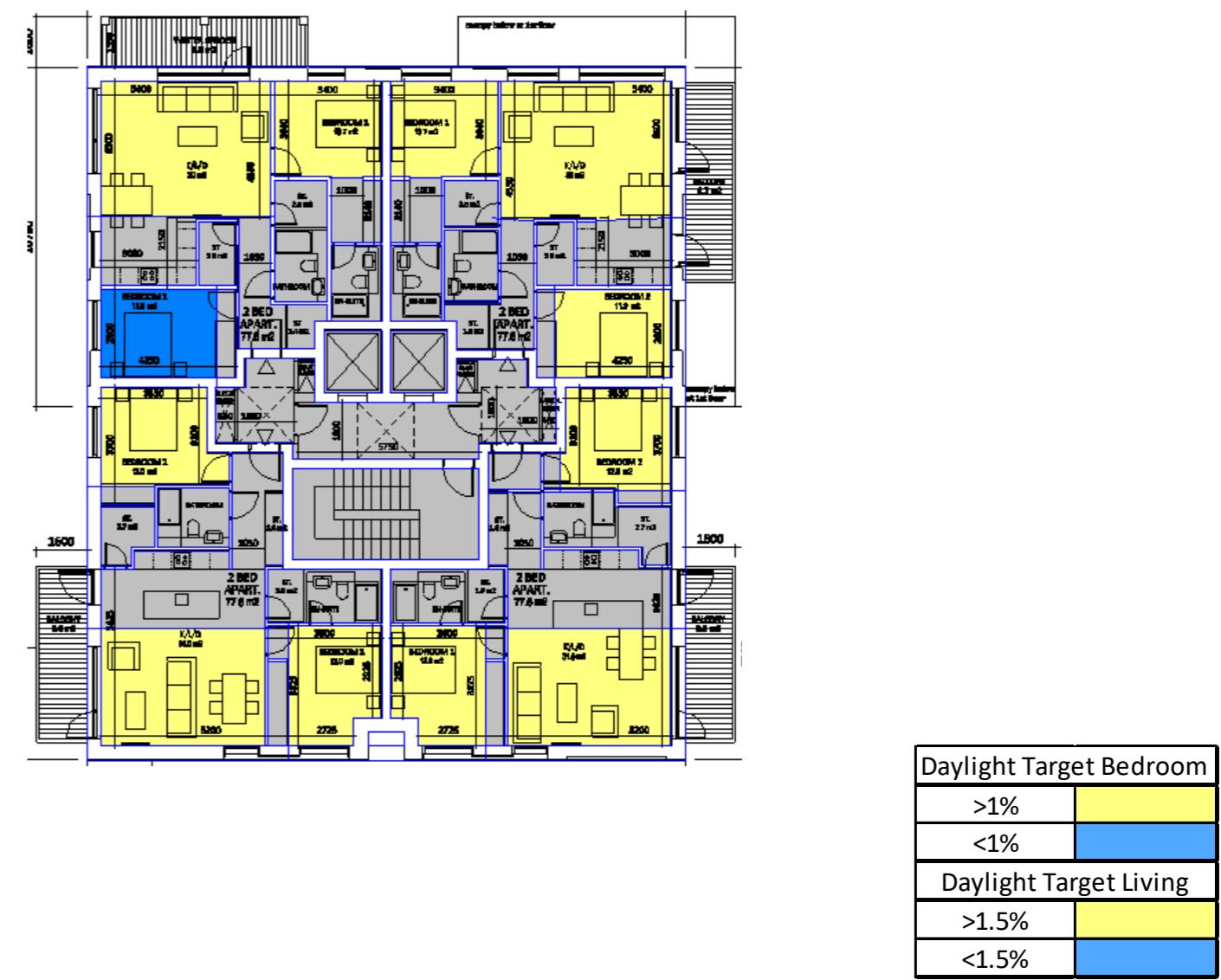
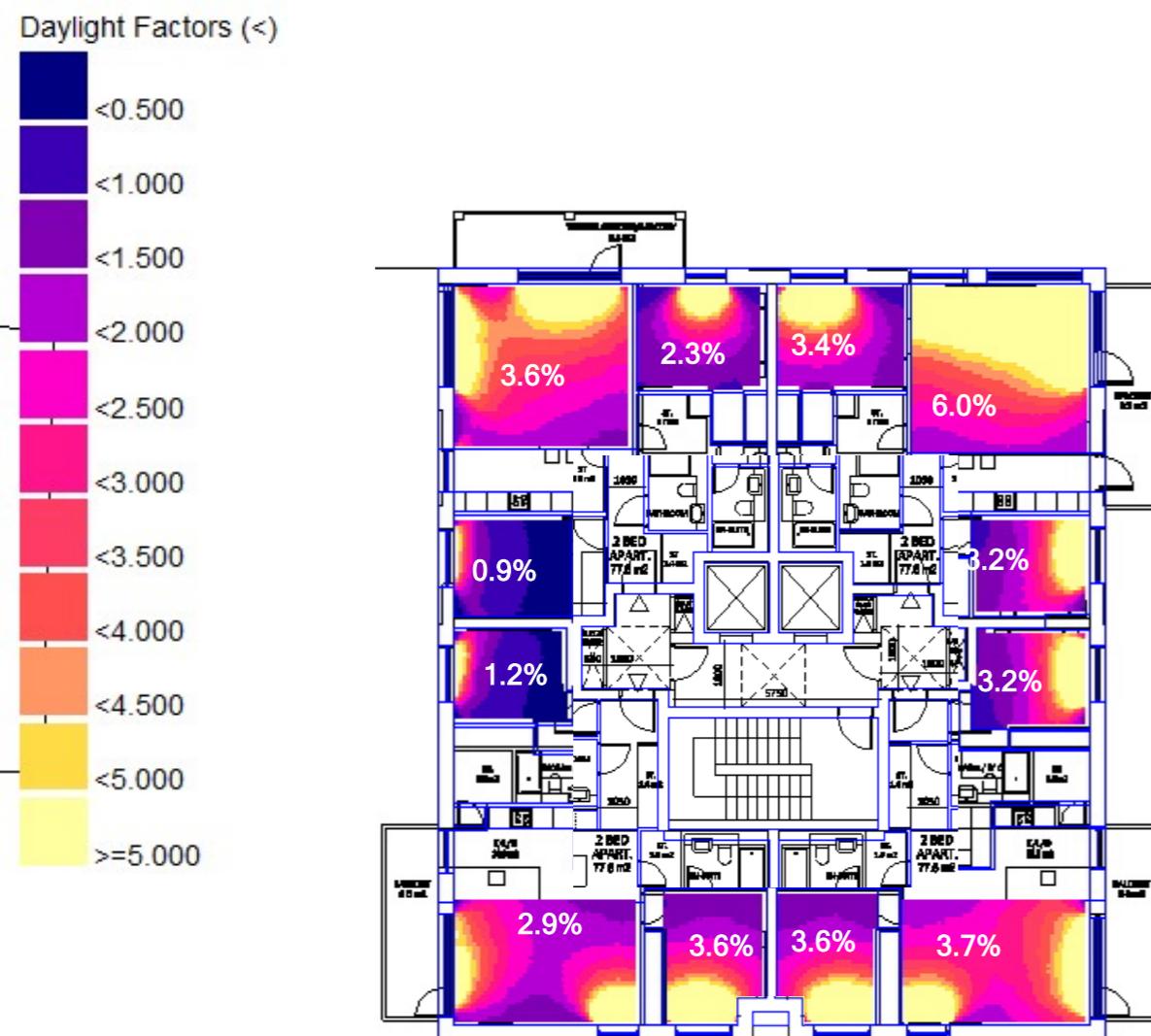
5.10 Second Floor Results – Block B

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's) 23 of 25 rooms exceed the BRE guidelines on the second floor.



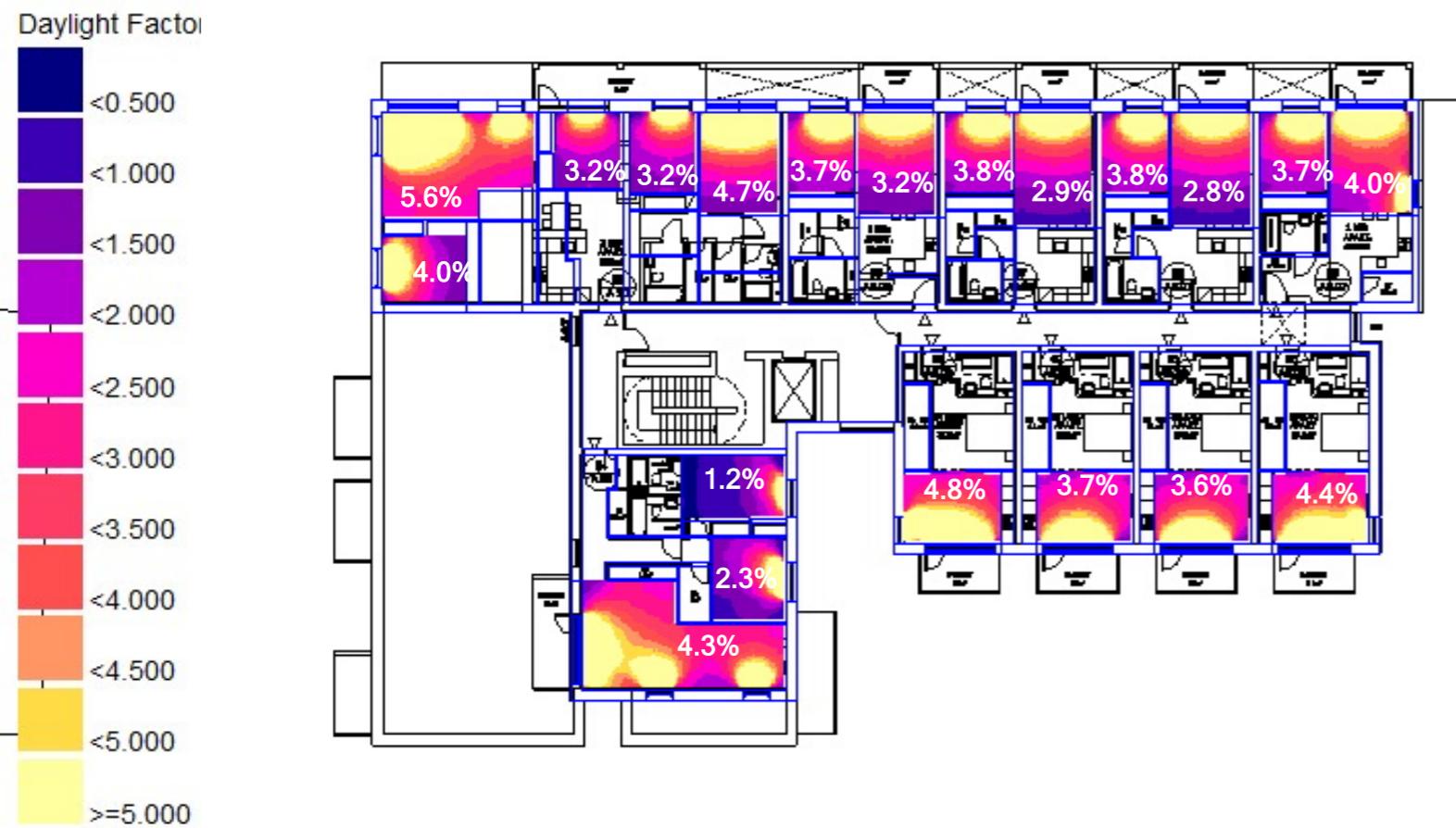
5.11 Second Floor Results – Block C

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's) 11 of 12 rooms exceed the BRE guidelines on the second floor.



5.12 Third Floor Results – Block A

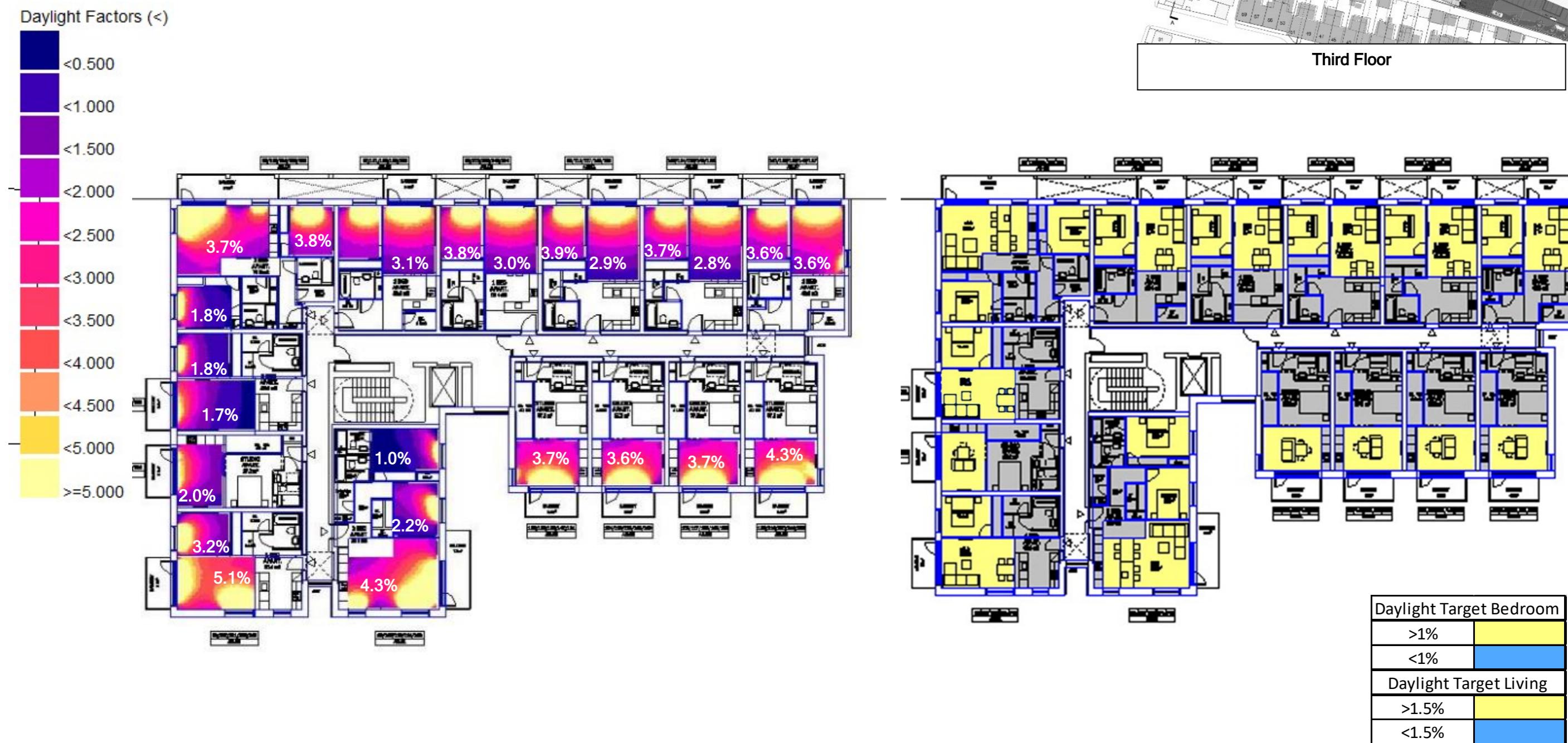
Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines.



Daylight Target Bedroom	>1%	<1%
>1%		
Daylight Target Living	<1%	
>1.5%		
<1.5%	<1.5%	

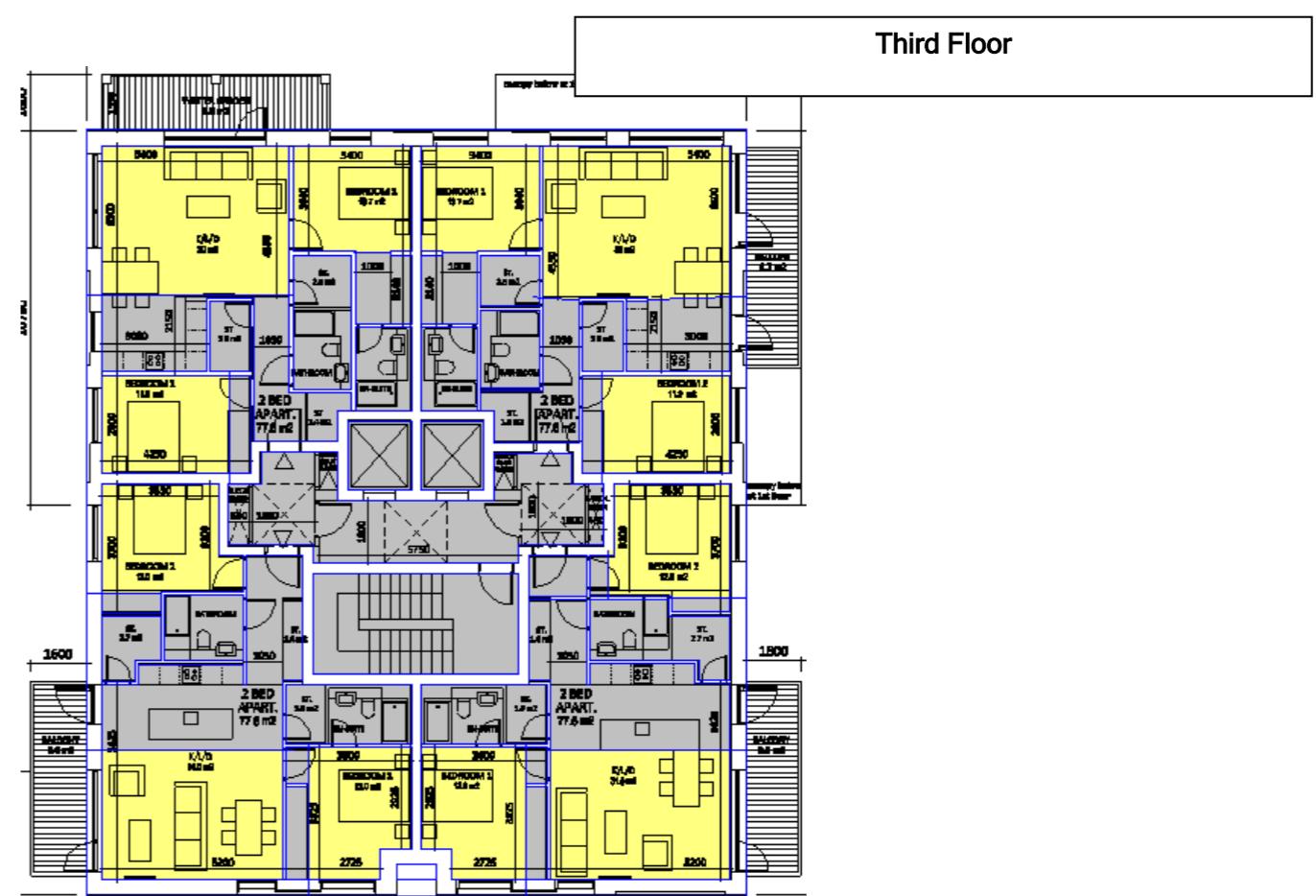
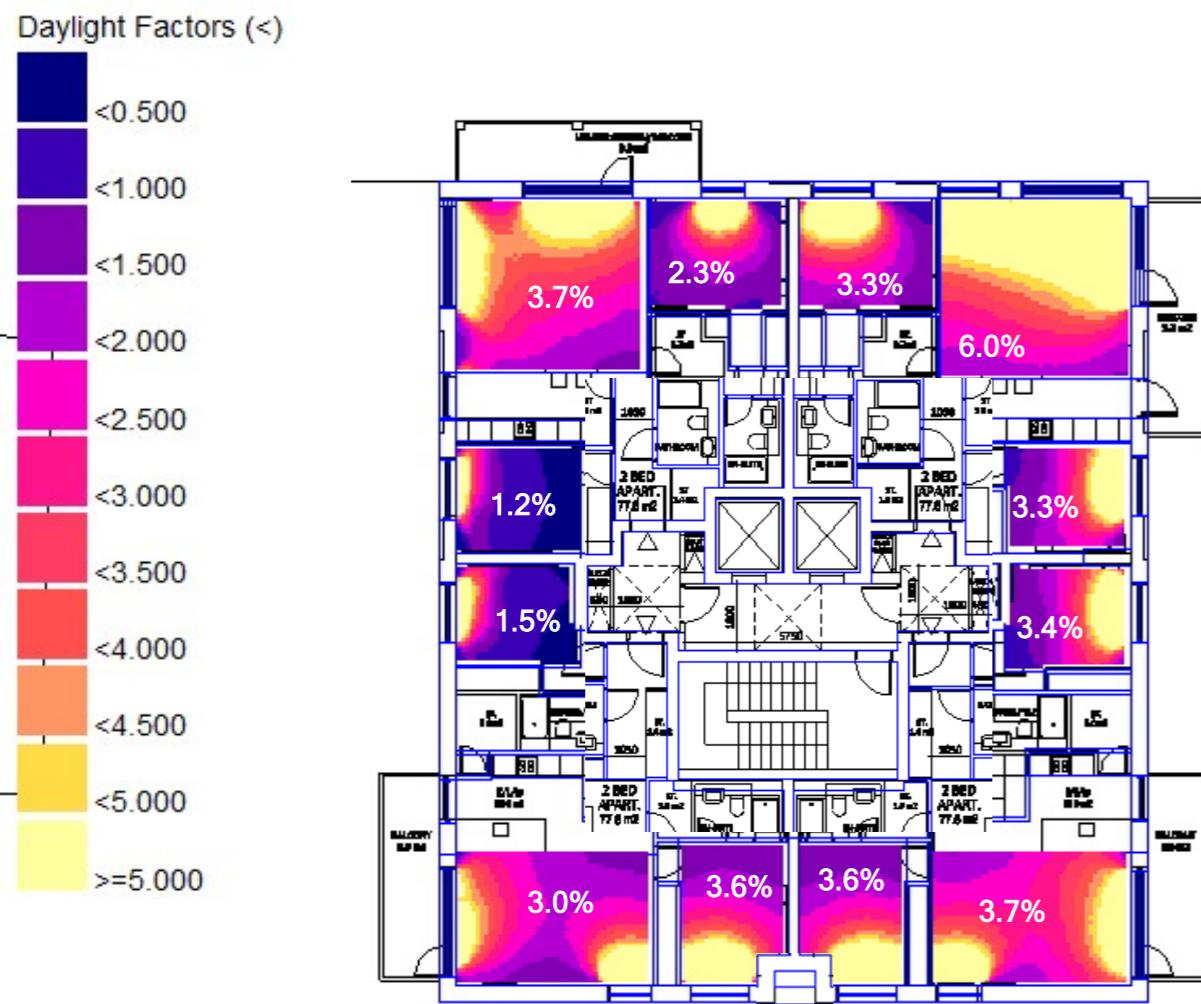
5.13 Third Floor Results – Block B

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines.



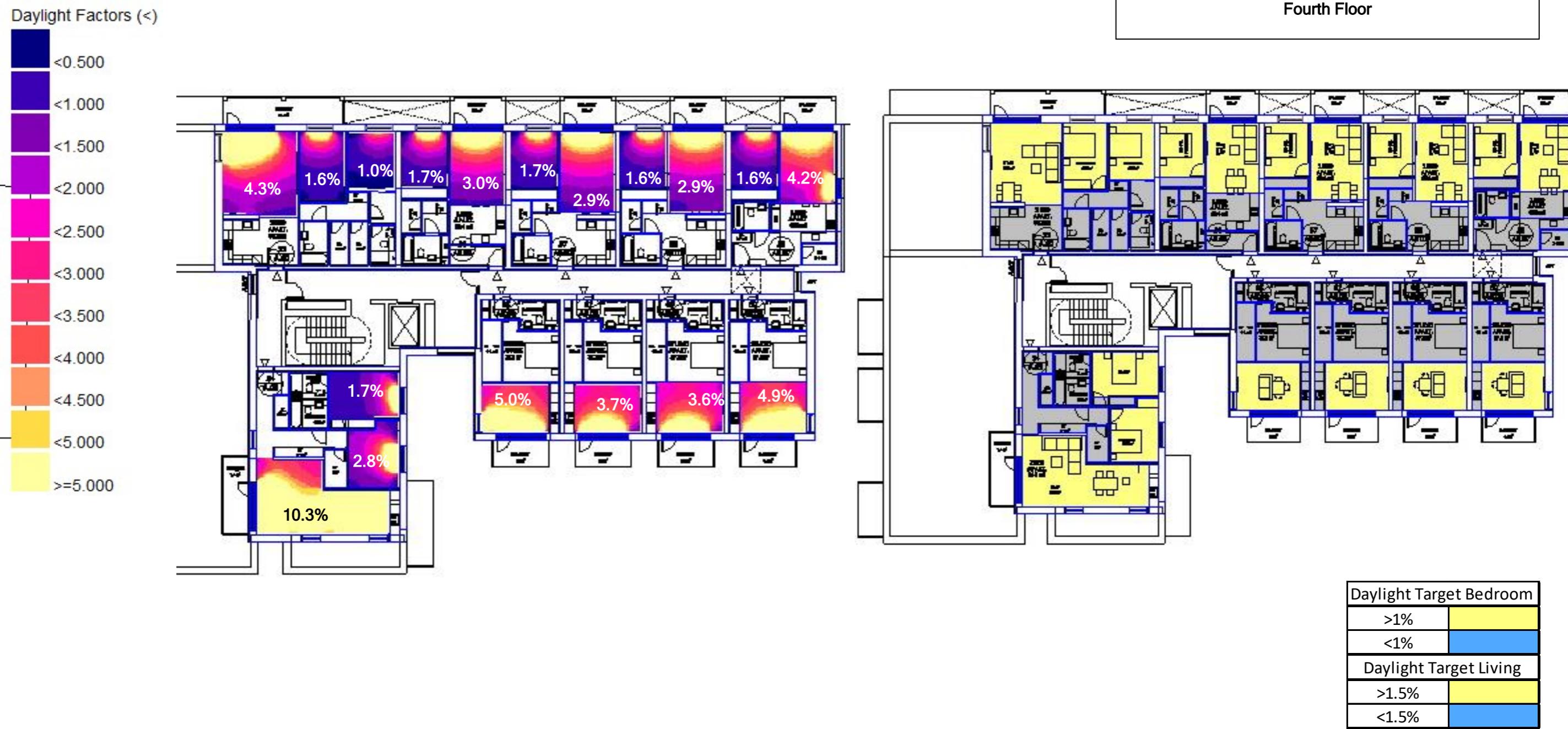
5.14 Third Floor Results – Block C

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines.



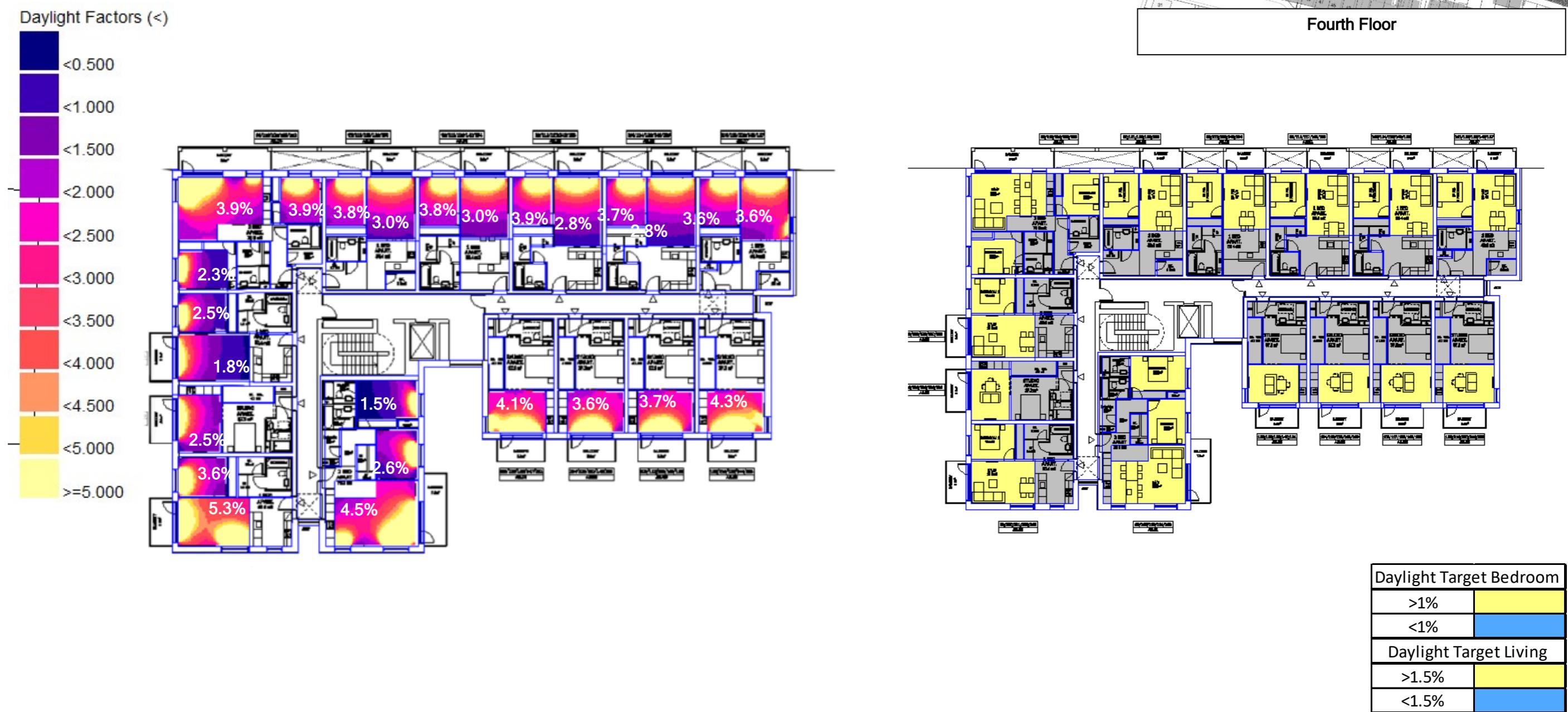
5.15 Fourth Floor Results – Block A

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the fourth floor.



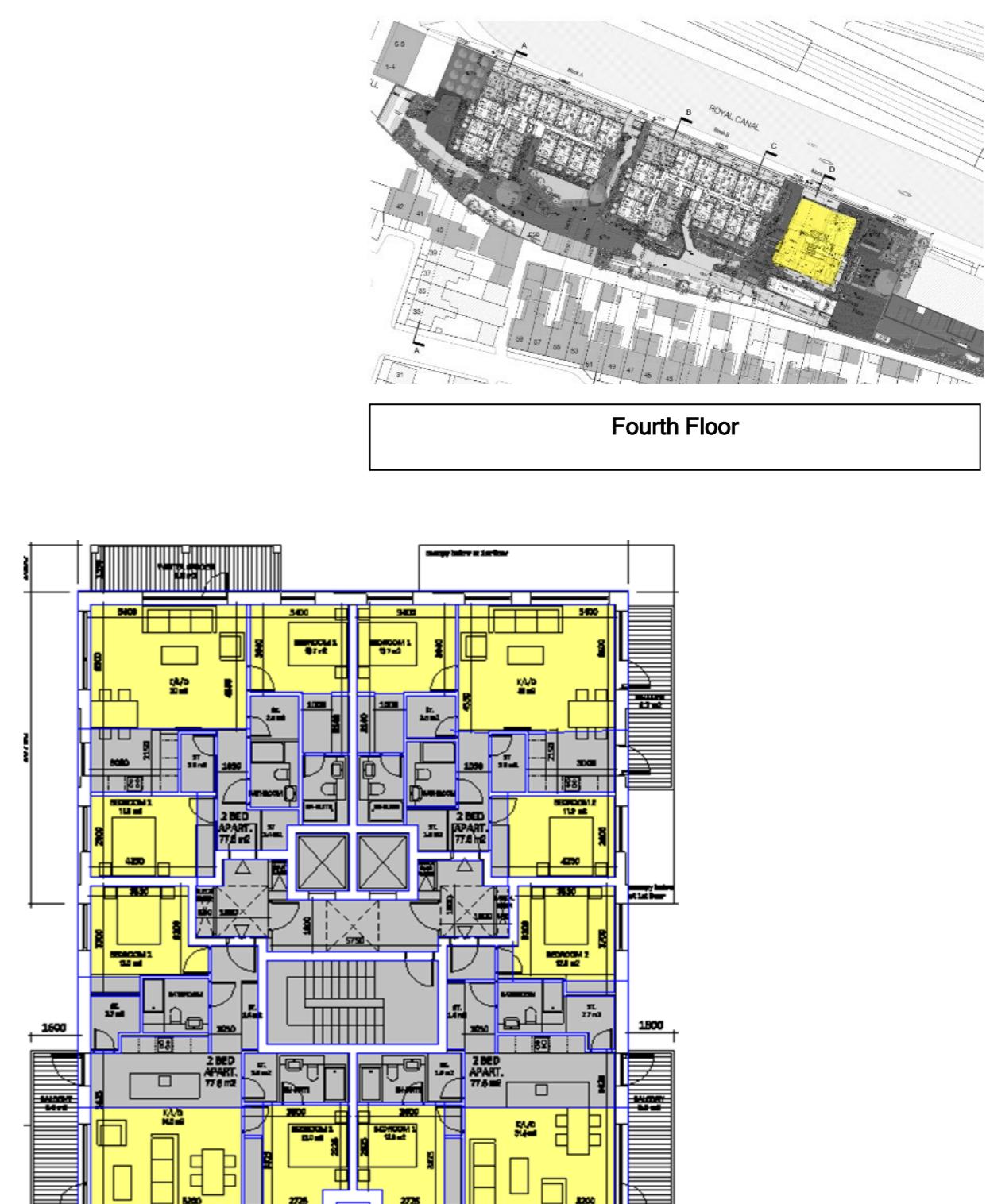
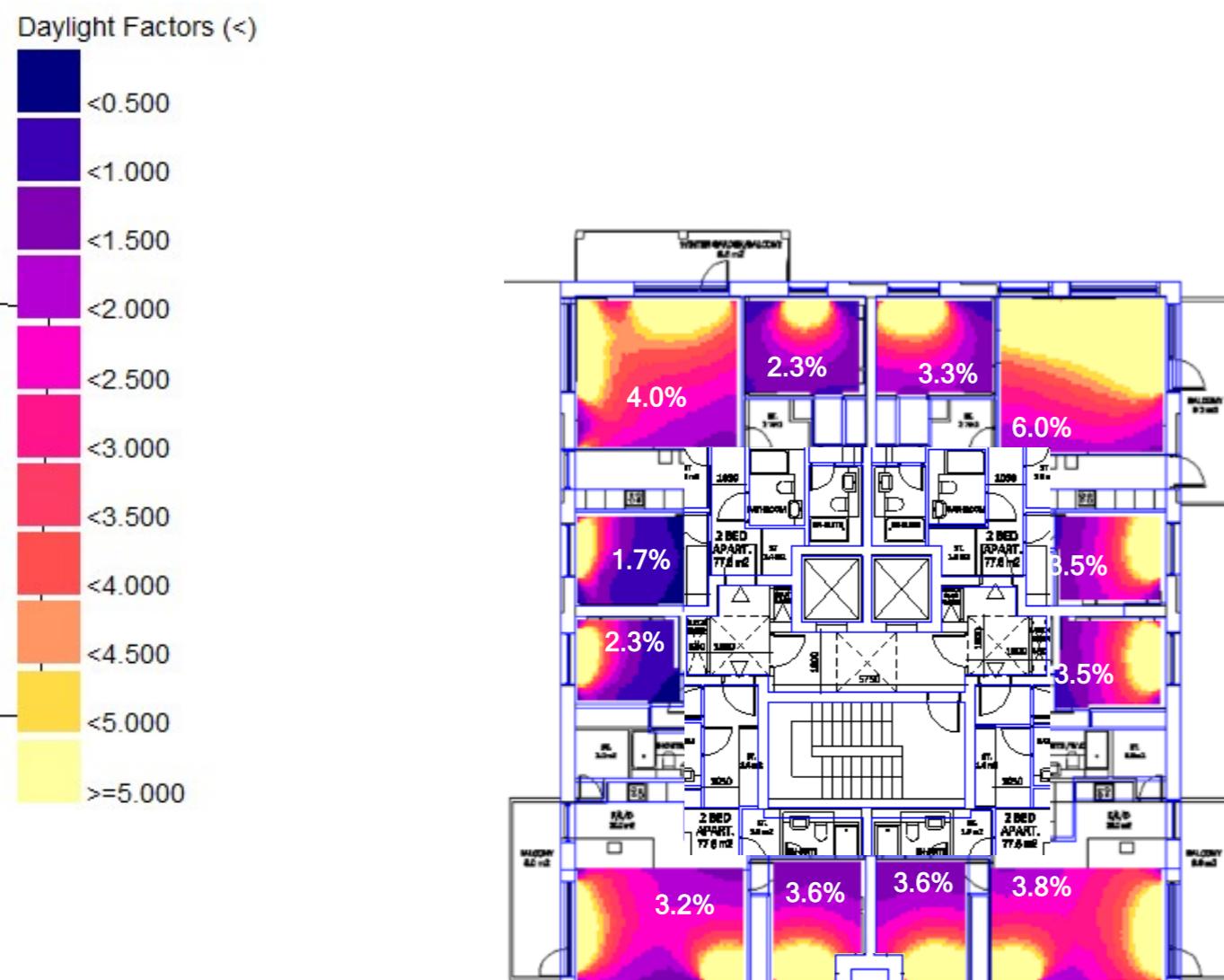
5.16 Fourth Floor Results – Block B

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the fourth floor.



5.17 Fourth Floor Results – Block C

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the fourth floor.



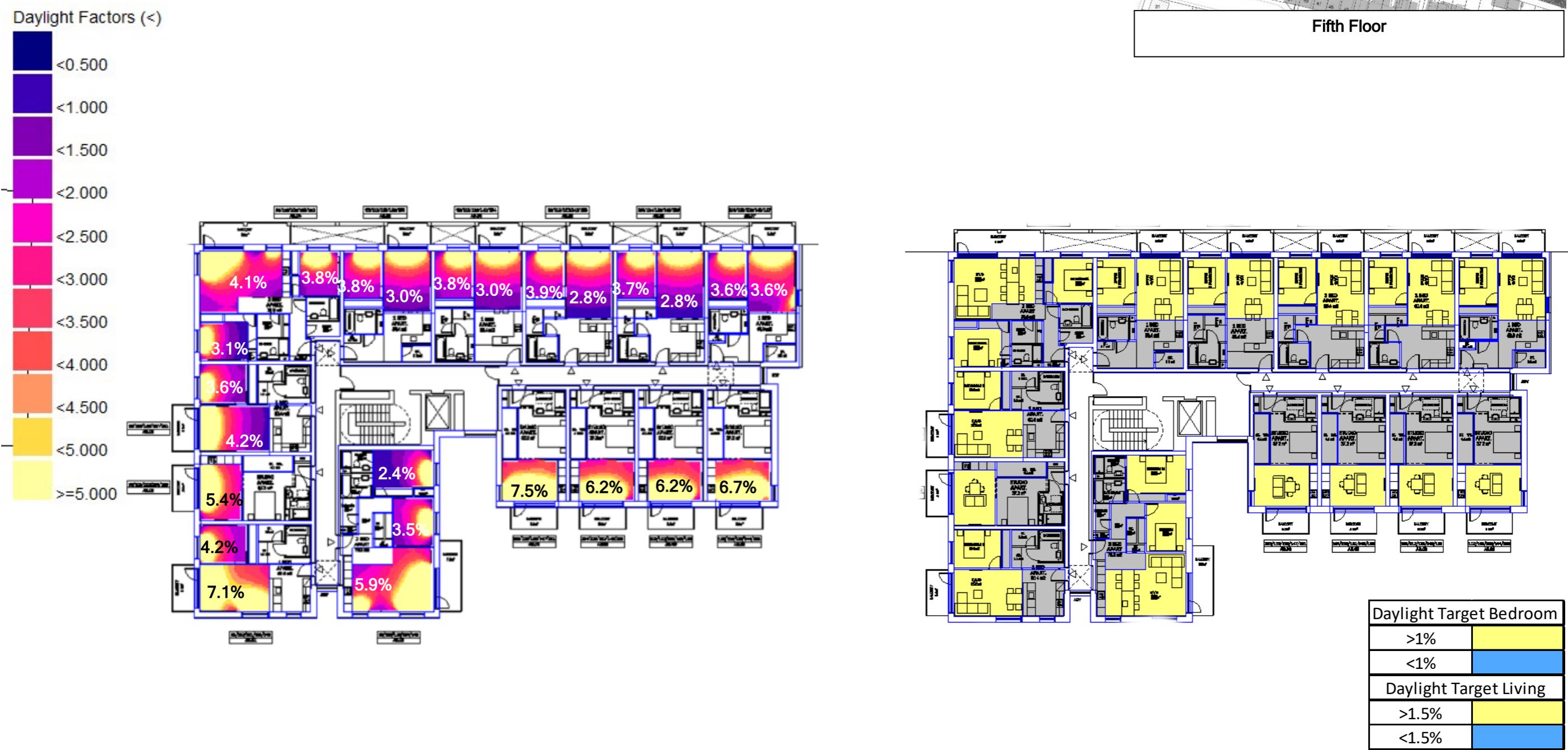
5.18 Fifth Floor Results – Block A

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the fifth floor.



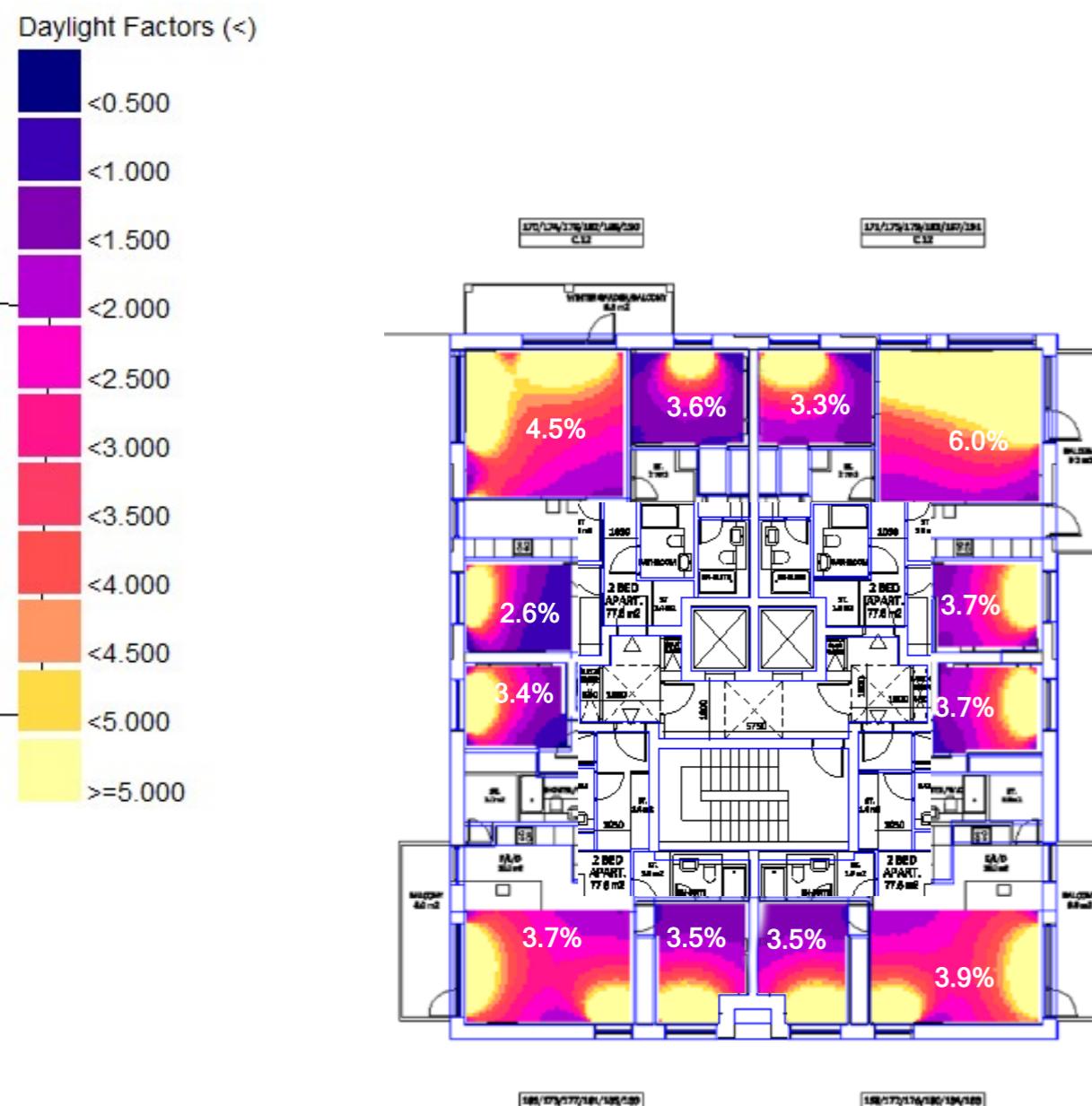
5.19 Fifth Floor Results – Block B

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the fourth floor.



5.20 Fifth Floor Results – Block C

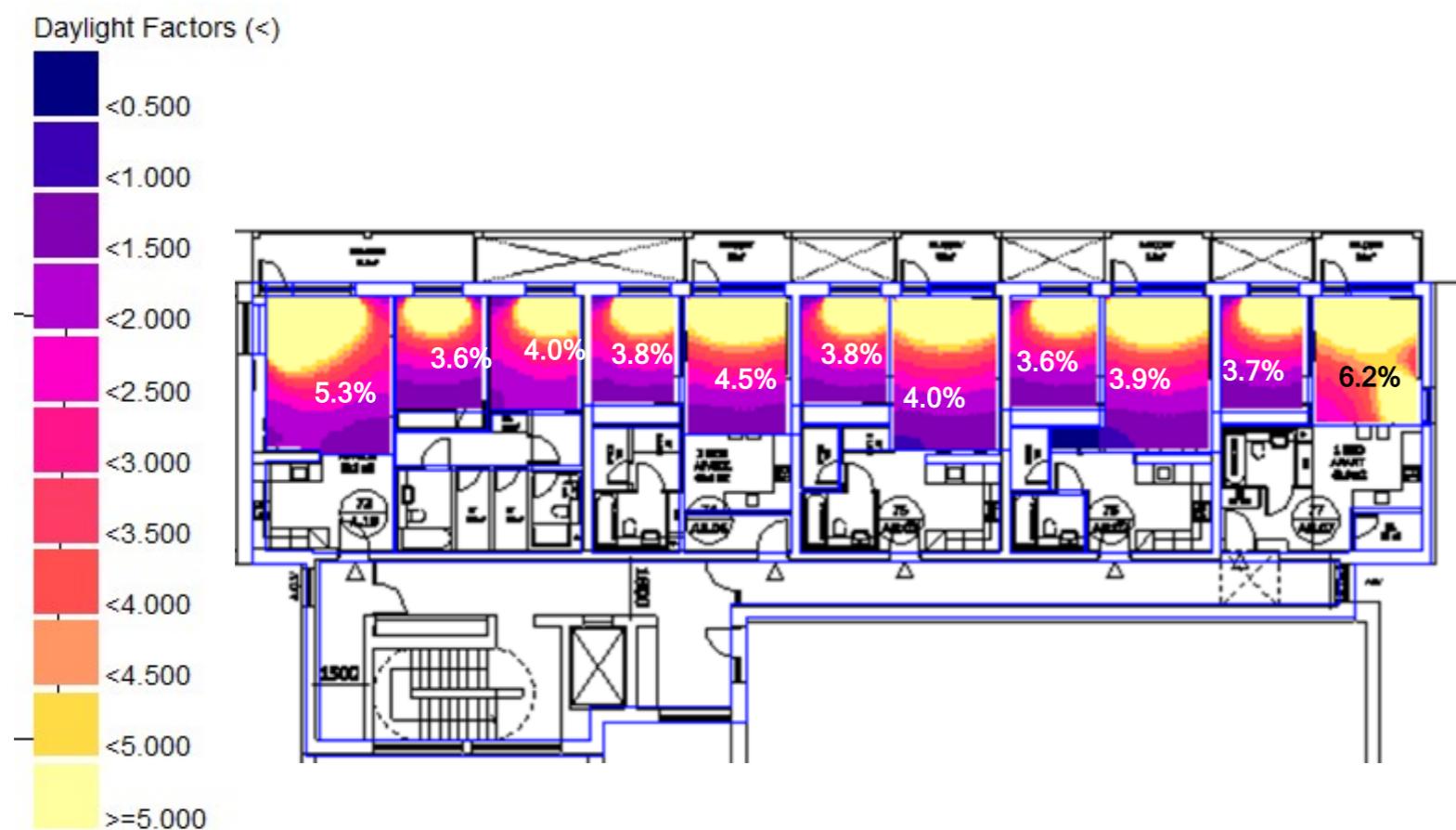
Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the fourth floor.



Fifth Floor

5.21 Sixth Floor Results – Block A

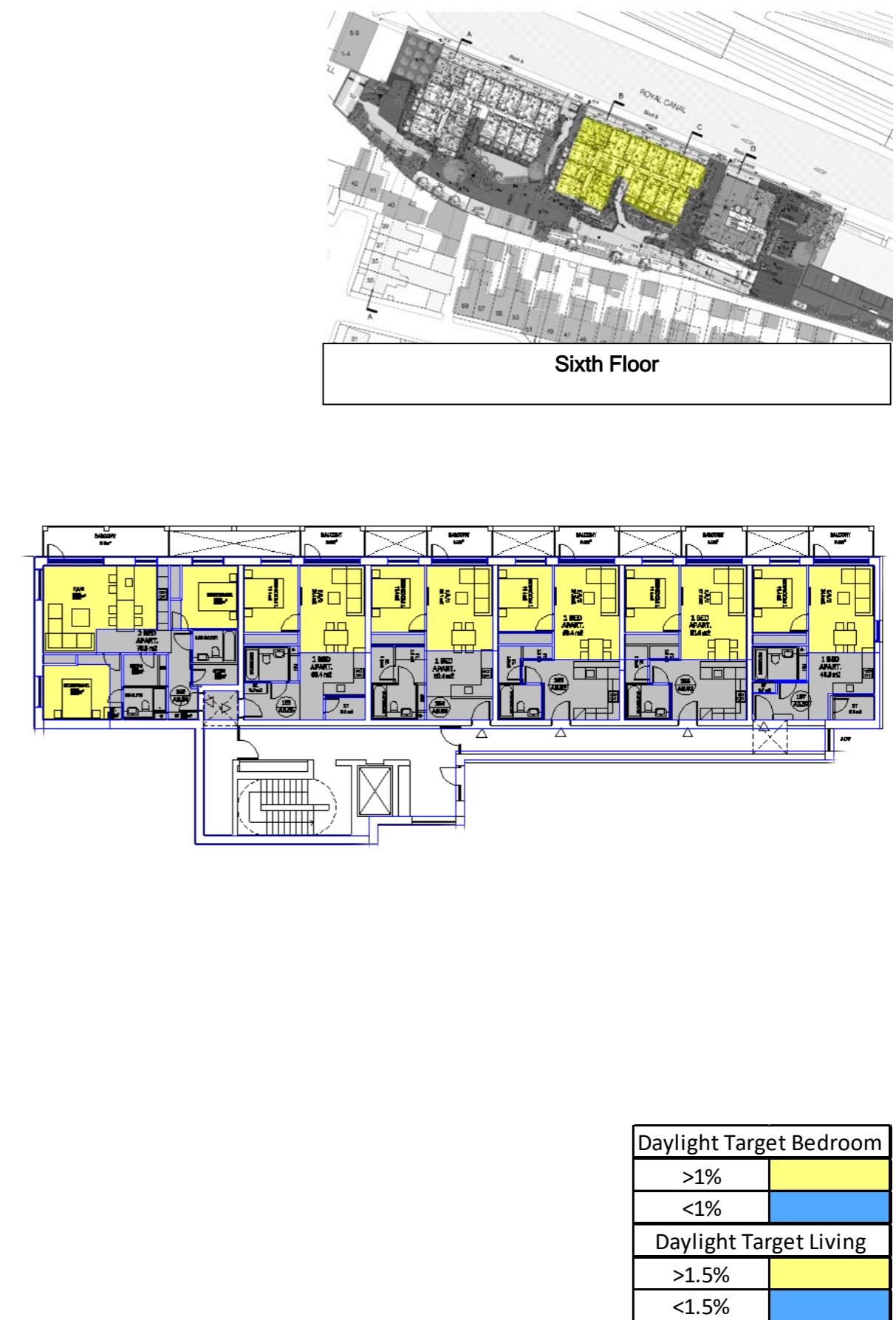
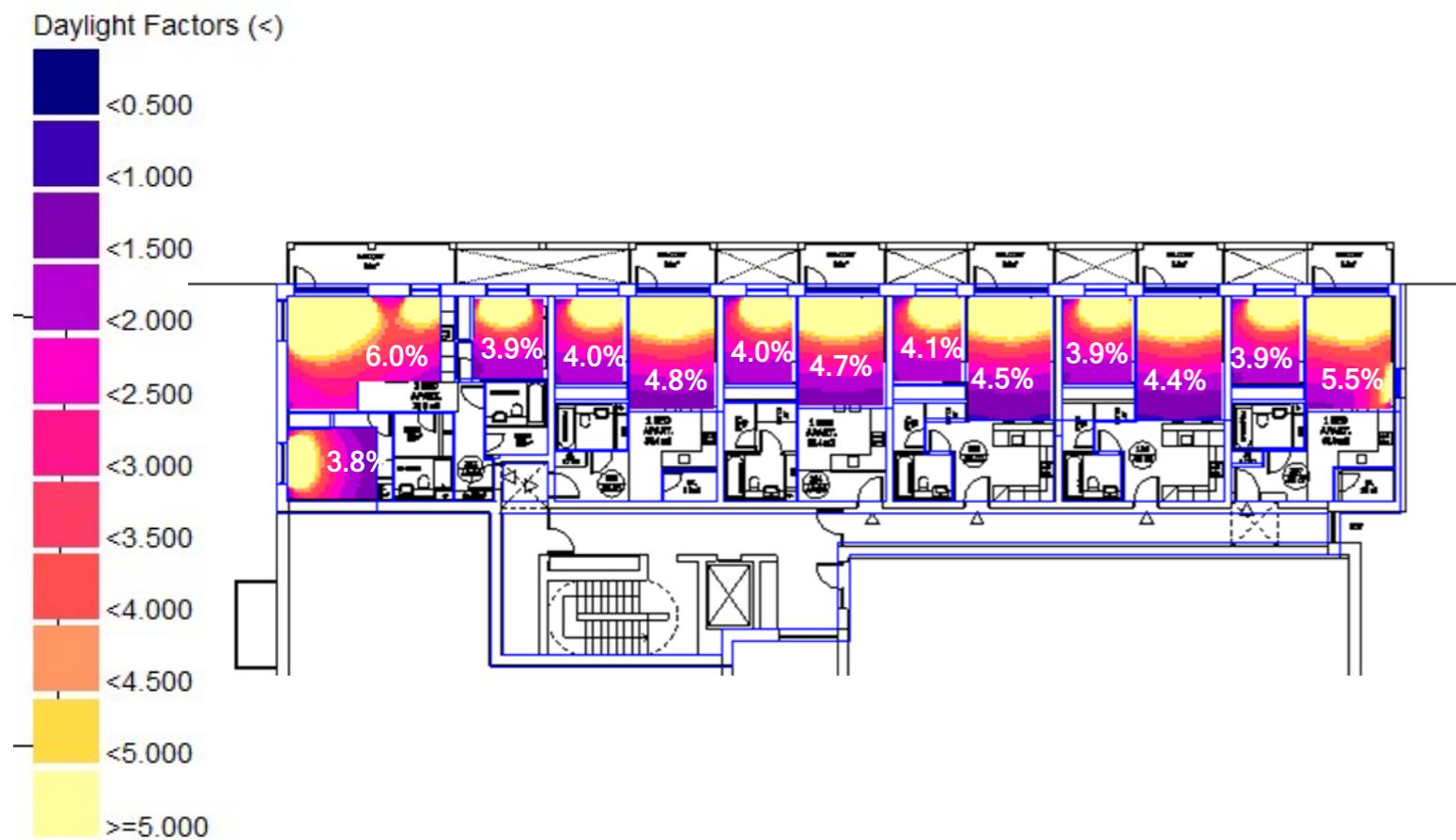
Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the sixth floor.



Daylight Target Bedroom	>1%	<1%
>1%		
Daylight Target Living	>1.5%	<1.5%
>1.5%		

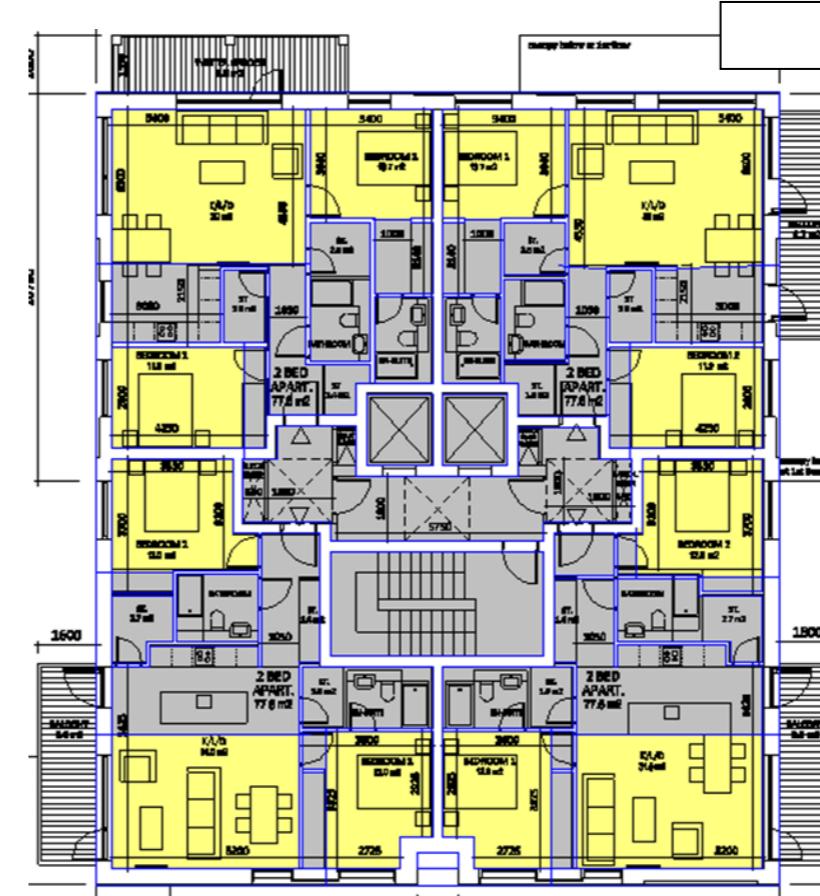
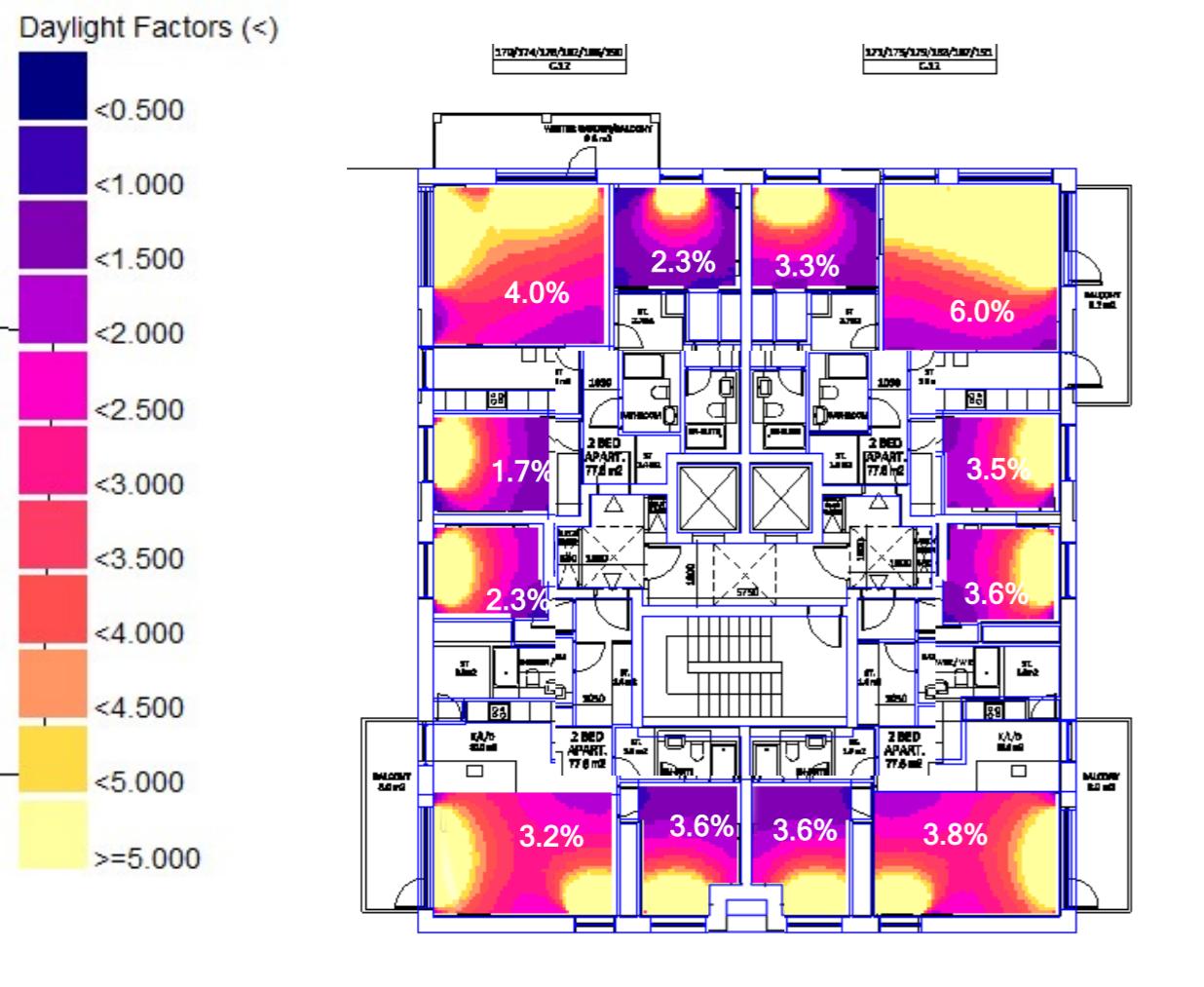
5.22 Sixth Floor Results – Block B

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the fourth floor.



5.23 Sixth Floor Results – Block C

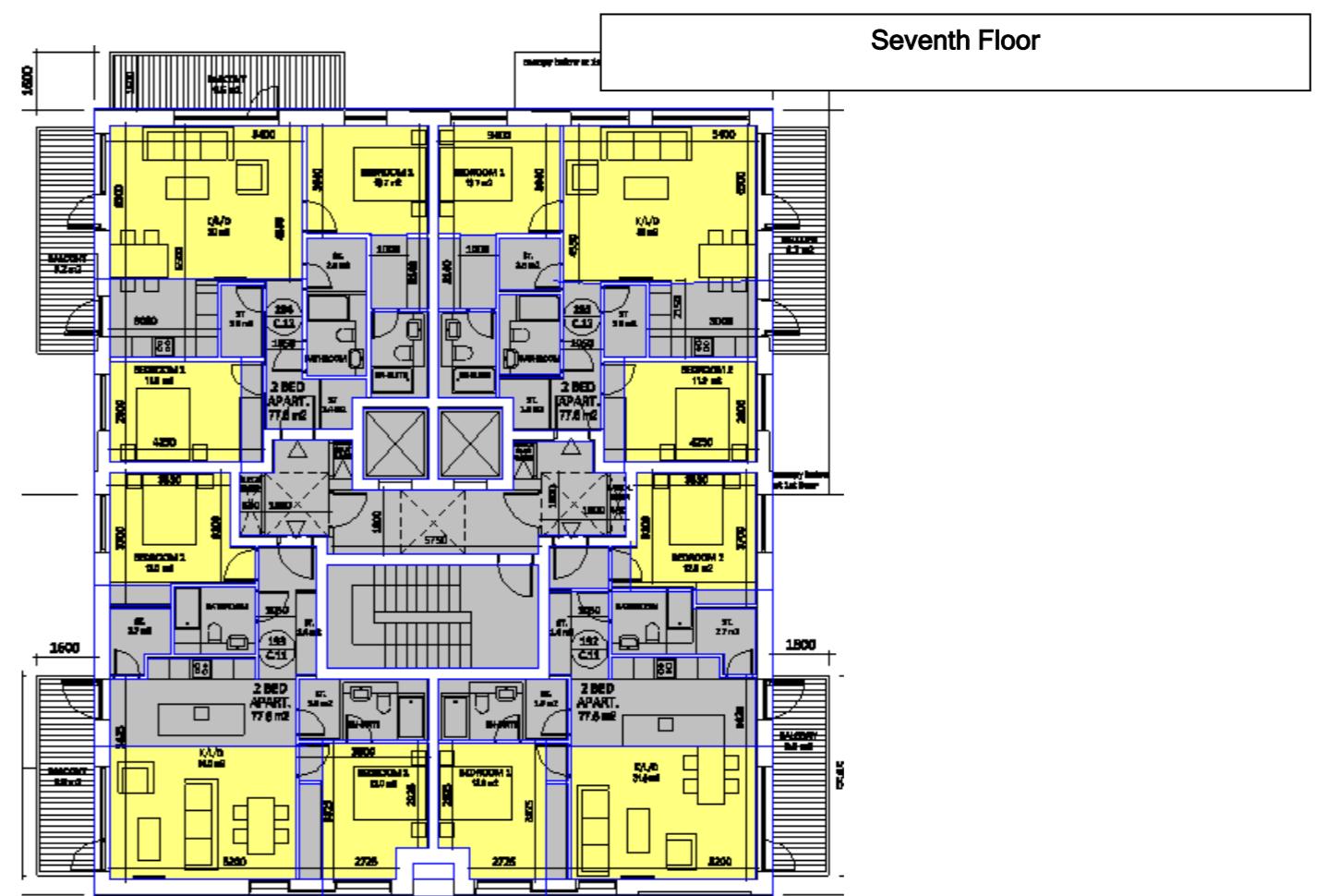
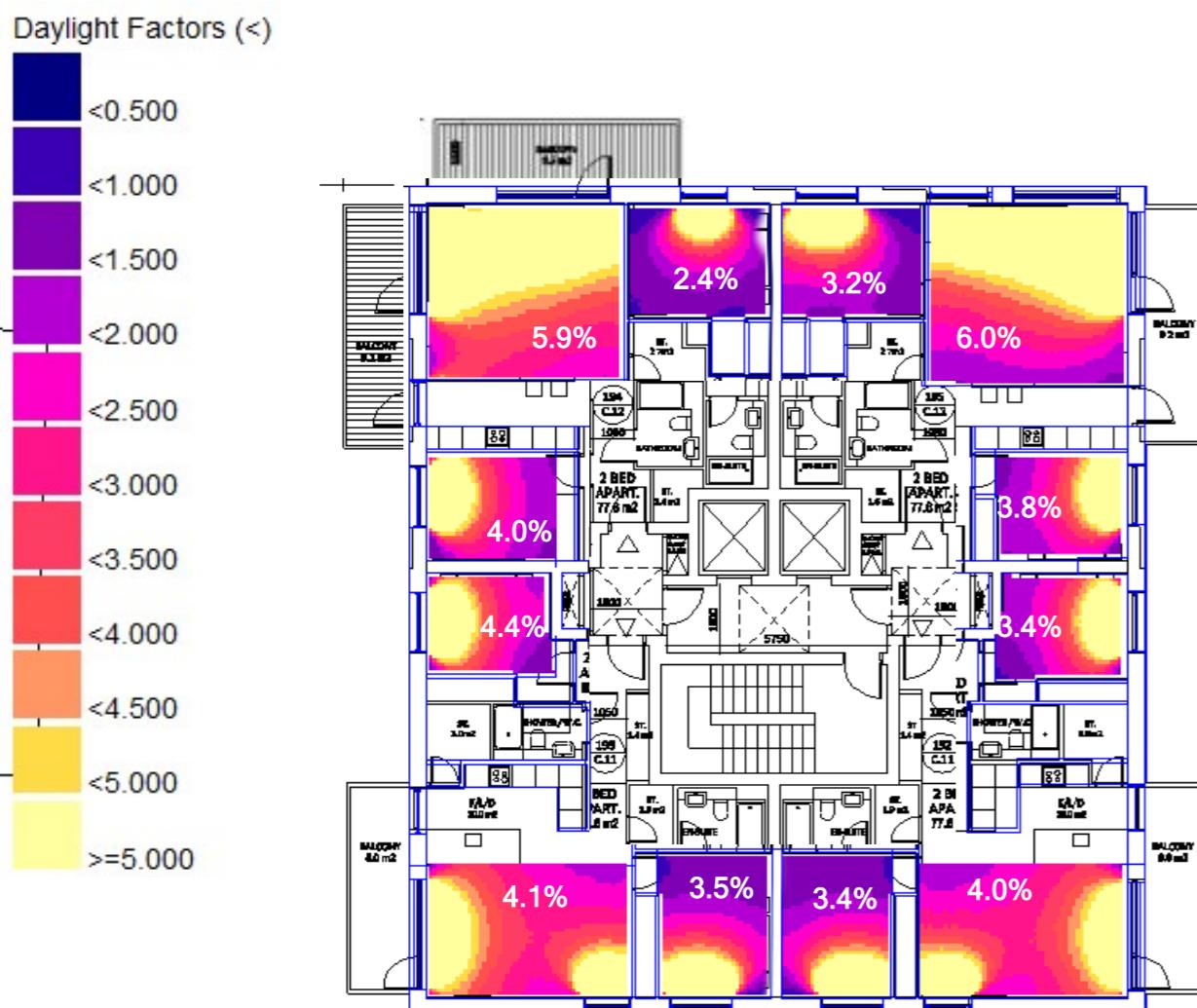
Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the fourth floor.



Daylight Target Bedroom	>1%	<1%
>1%		
Daylight Target Living	>1.5%	<1.5%
>1.5%		
<1.5%		

5.24 Seventh Floor Results – Block C

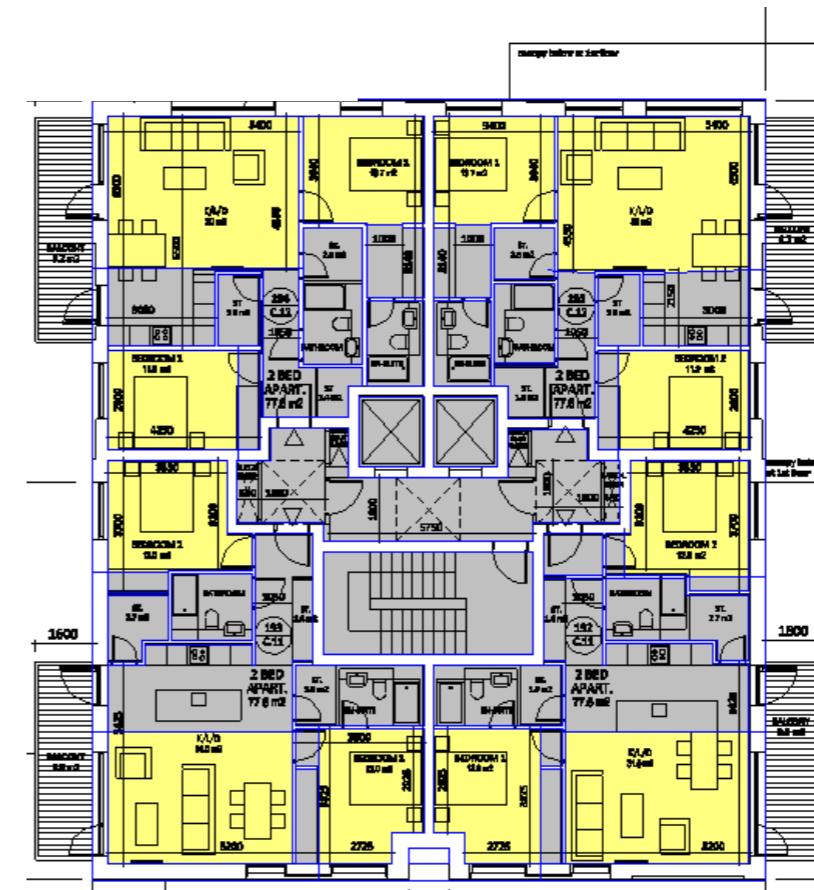
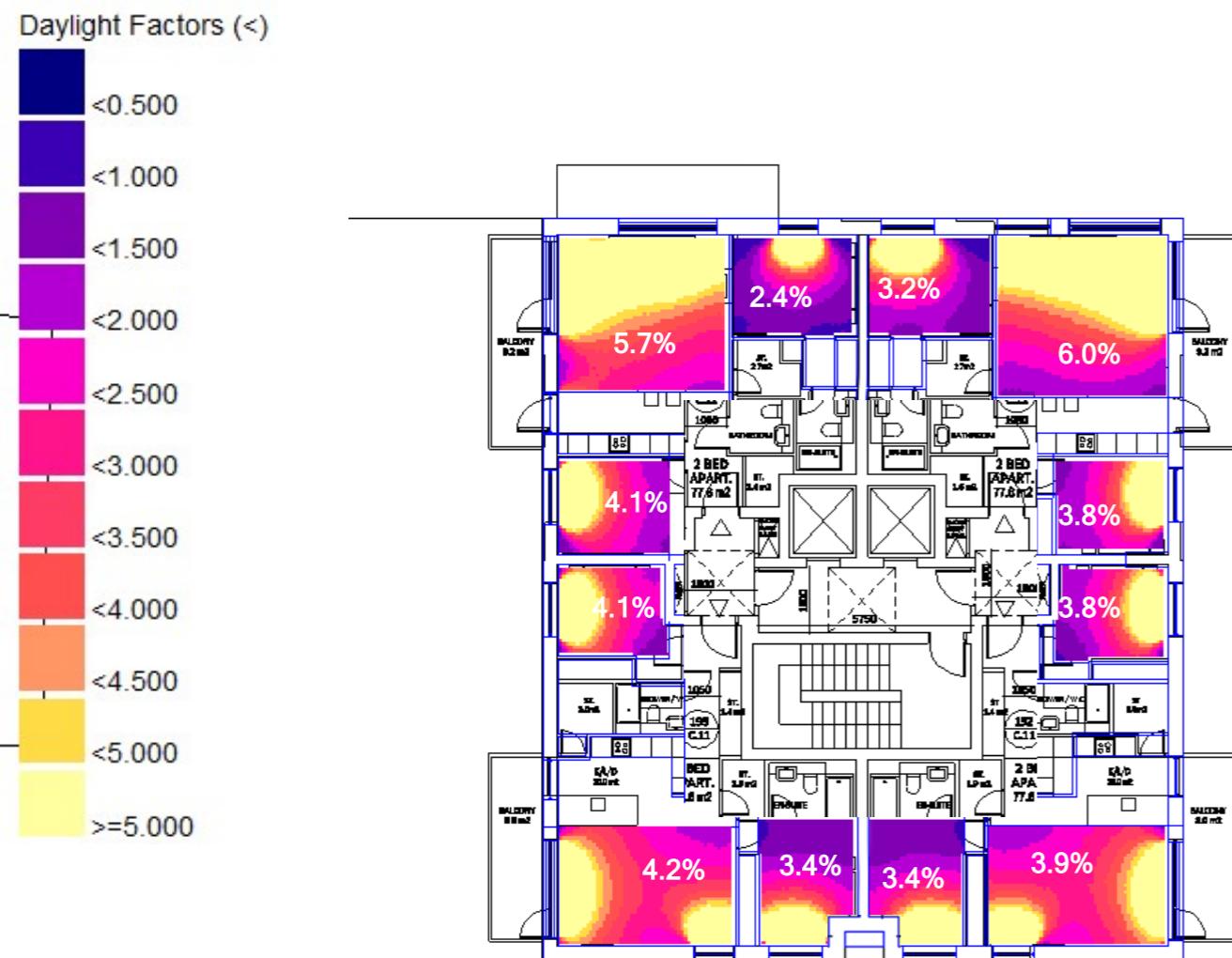
Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the seventh floor.



Daylight Target Bedroom
>1%
<1%
Daylight Target Living
>1.5%
<1.5%

5.25 Eighth Floor Results – Block C

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the eighth floor.

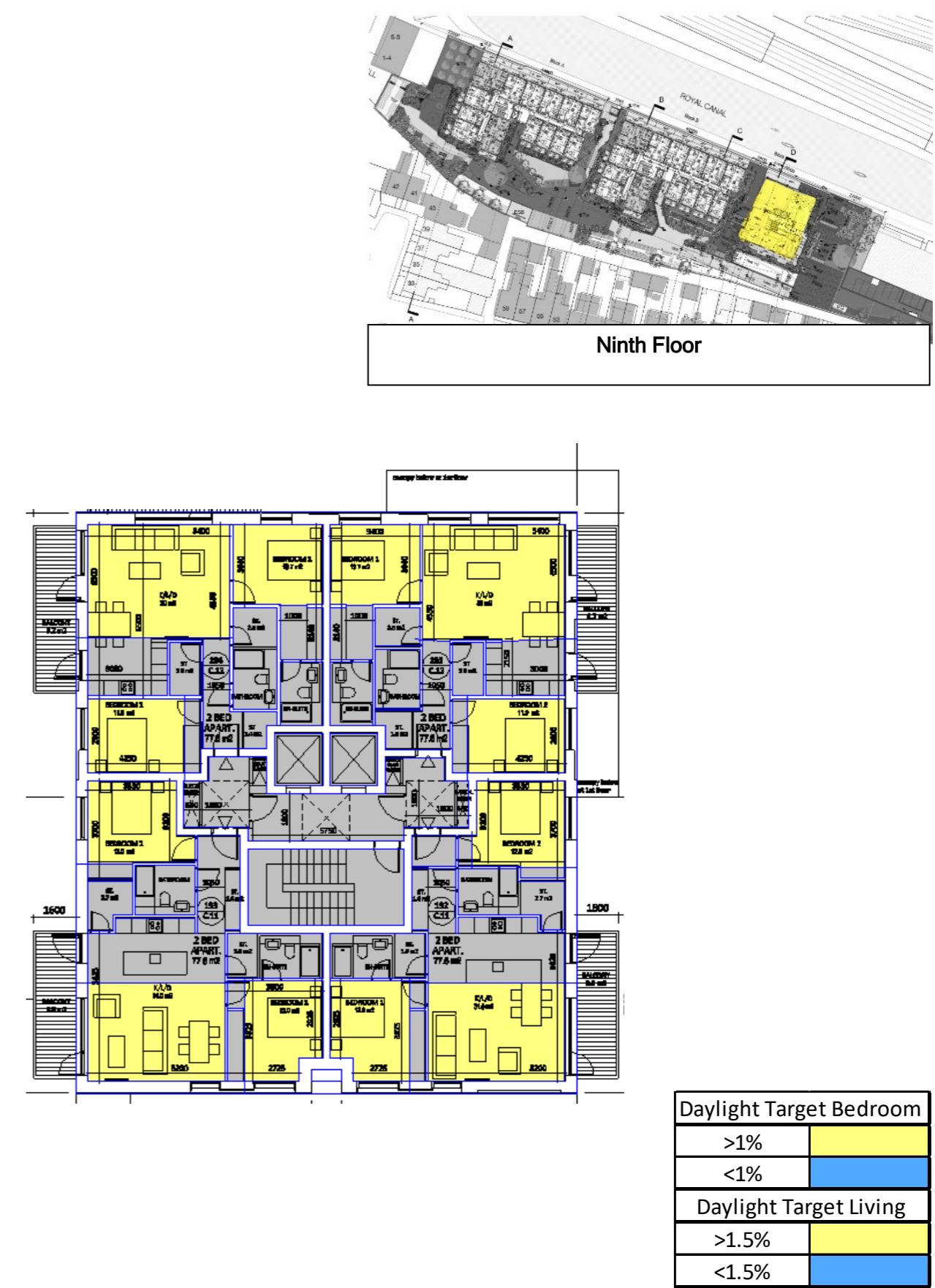
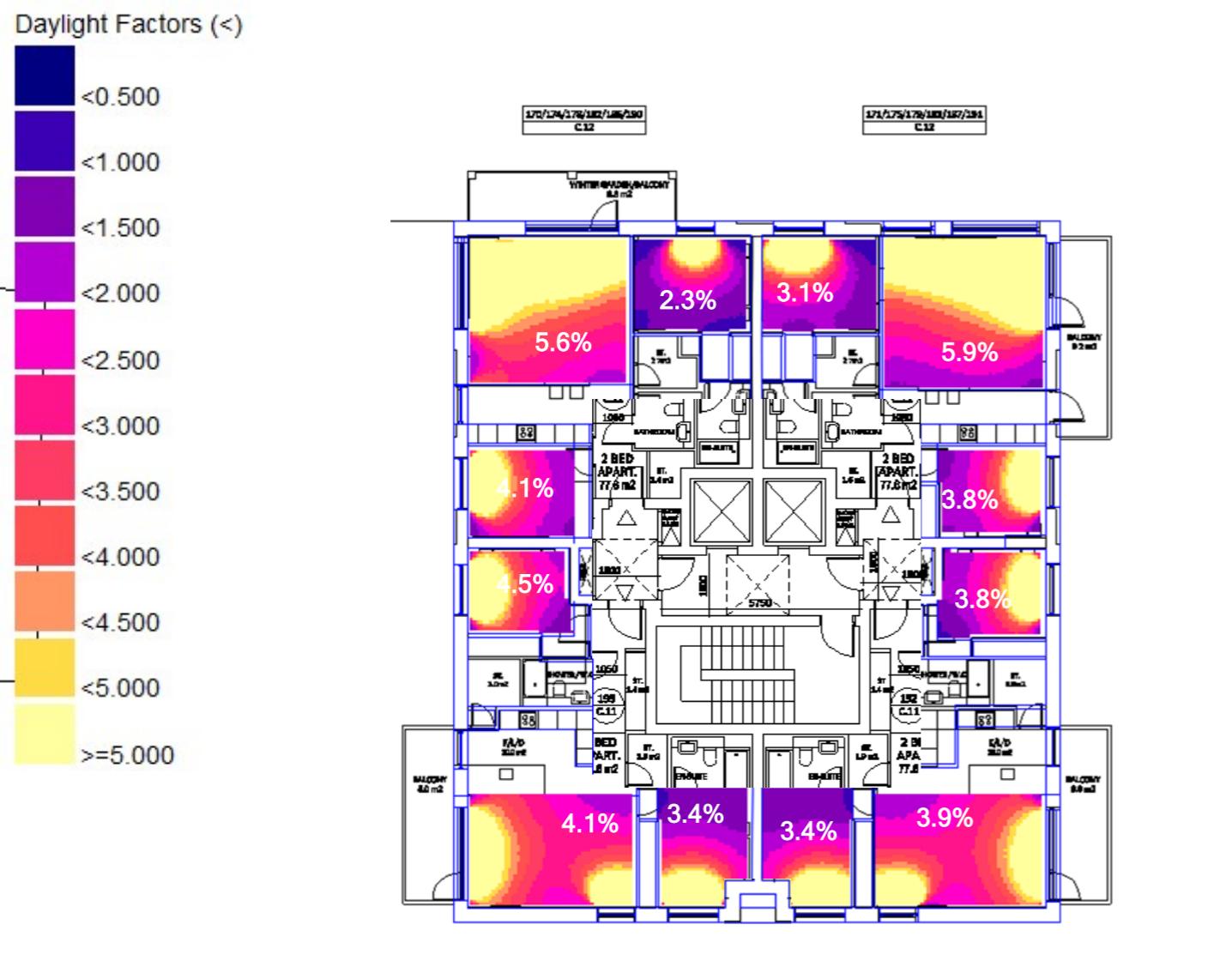


Daylight Target Bedroom	>1%	<1%
>1%	>1%	<1%
Daylight Target Living	>1.5%	<1.5%
>1.5%	>1.5%	<1.5%



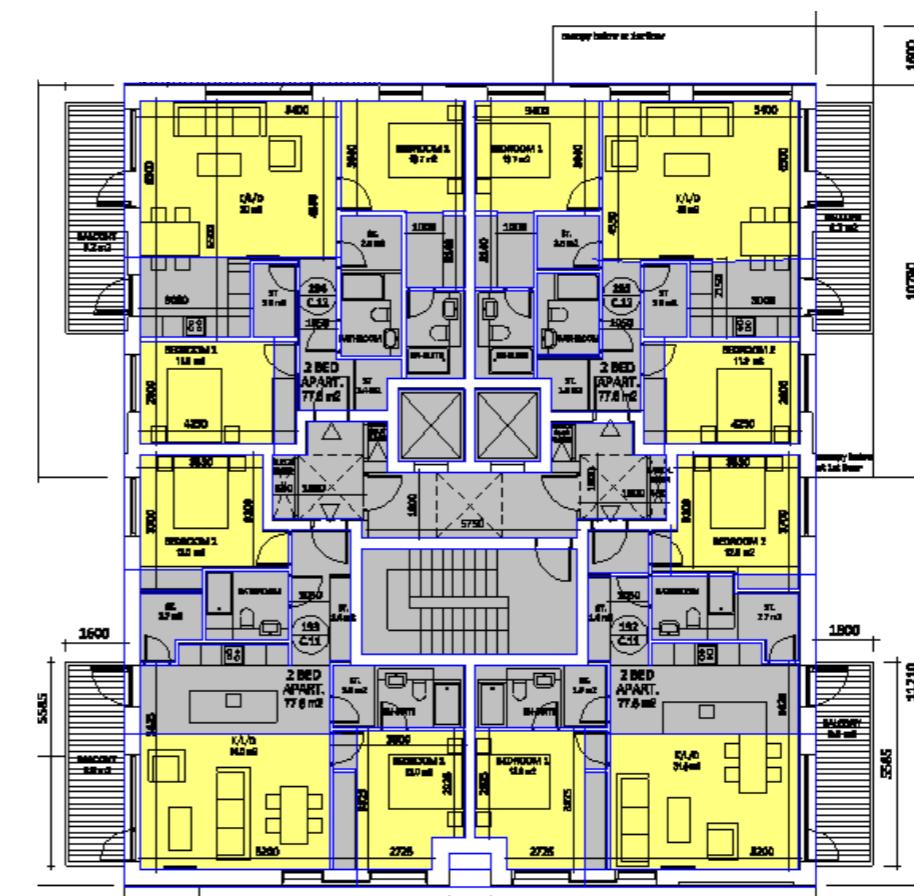
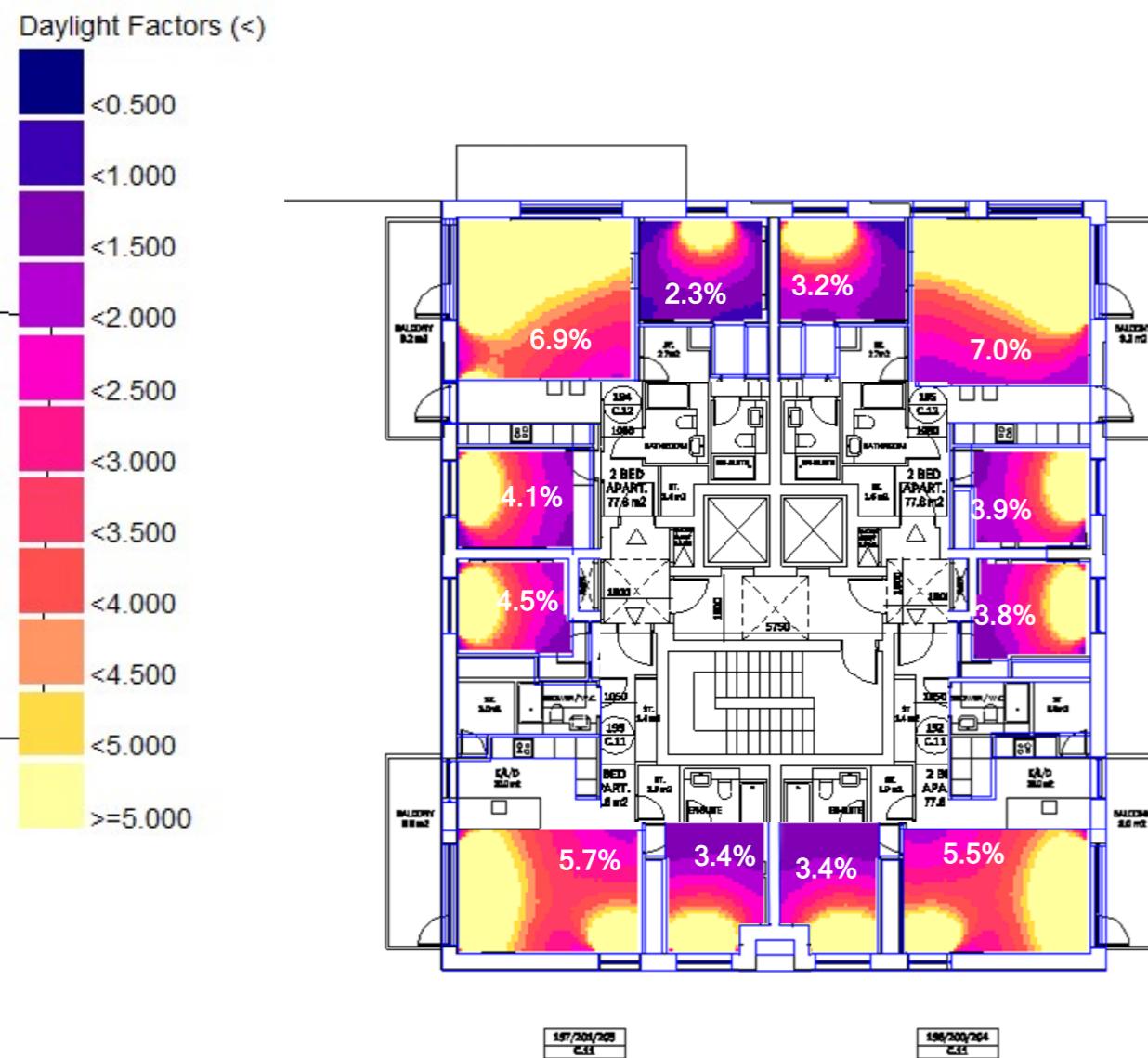
5.26 Ninth Floor Results – Block C

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the ninth floor.



5.27 Tenth Floor Results – Block C

Daylighting analysis as illustrated below, determined the following daylighting performance with associated Average Daylight Factors (ADF's). All rooms exceed the BRE guidelines on the tenth floor.



Daylight Target Bedroom	>1% (Yellow)	<1% (Blue)
>1%		
<1%		
Daylight Target Living	>1.5% (Yellow)	<1.5% (Blue)
>1.5%		
<1.5%		



APPENDIX A - DAYLIGHT STANDARDS

The Daylight Analysis section of the report assesses the Average Daylight Factors in accordance with the BRE 209 guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition). This guide is specifically referenced within Section 6.6 of The Department of Housing, Planning and Local Government document - Sustainable Urban Housing: Design Standards for New Apartments (2018) which advises that:

Planning authorities should have regard to quantitative performance approaches to daylight provision outlined in guides like the BRE guide 'Site Layout Planning for Daylight and Sunlight' (2nd edition) or BS 8206-2: 2008 - 'Lighting for Buildings - Part 2: Code of Practice for Daylighting' when undertaken by development proposers which offer the capability to satisfy minimum standards of daylight provision.

Subsequent to this guidance, a new European Standard for Daylight in Buildings (EN 17037) was released in 2018 and adopted as IS EN 17037 in January 2019. This standard does not fall under any *mandatory* directive of the EU or any Irish Statutory Instrument and therefore remains *advisory*.

On release of the EN standard within the UK, the BRE confirmed their intention to provide a National Annex, which will subsequently inform an updated and revised BRE 209 document. The rational for this Annex was that the Median Daylight Factor methodology applied within EN 17037 do not differentiate between residential and non-residential applications, with the standard stipulating a minimum target illuminance of 300 lux for all Building Applications. However, it is recognised by BRE that Dwellings have lower natural light requirements compared to non-domestic buildings (i.e. BS. 8602-2 has Average Daylight Factors of 1.0-2.0% for dwellings, as opposed to Average Daylight Factors of 2.0-5.0% for non-residential). Furthermore, providing higher daylight level in residential applications may in some instances be counter-productive in that excessive glazing provision may promote overheating.

This Annex, which was included in the British Standard version of EN 17037 identifies the target illuminances for dwellings that should be exceeded for over at least 50% of a room, and for at least half of annual daylight hours (i.e. Median). Utilising the Median External Illuminance of 14,900 Lux for Dublin (EN 17037 Table A.3) the following Median Daylight Factors may therefore be applied, adopting the methodology used in BS.EN 17037 Annex NA:

Room type	Target illuminance E_T (lx)	Median Daylight Factors
Bedroom	100	0.7%
Living room	150	1.0%



Fig A.1: Daylight Standards

APPENDIX A - DAYLIGHT STANDARDS

A compliance comparison was then made for a sample data set of Living/ Dining Rooms (Block M, L00, Podium) between the existing B.S.8206-2008 (as referenced within BRE.209, DoHPLG Planning Guidelines and used for analysis within this report) and the BS EN.17037:2018 Annex NA (as understood to be introduced in forthcoming BRE.209 Guidelines).

Figure A.2 compares for all Living/ Dining spaces within the scheme:

- Average Daylight Factor (ADF) as per BS.8206-2 (horizontal axis), with rooms deemed compliant where ADF exceeds 1.5%.
- Extent of room where Daylight Factor exceeds BS.EN.17037 Annex NA target of 1.0% (vertical axis), with rooms deemed compliant where extent exceeds 50% (i.e. Median Daylight Factor or MDF).

This graph illustrates that the results are generally aligned under both methodologies, with rooms where compliance in accordance with B.S.8206-2 within this report has been confirmed were also generally found to be compliant to BS.EN.17037 Annex NA (green zone) and the conversely non-compliances also true (red zone). There were only some isolated rooms found compliant to BS.8206-2 deemed (borderline) non-compliant to the EN.17037 methodology assessed.

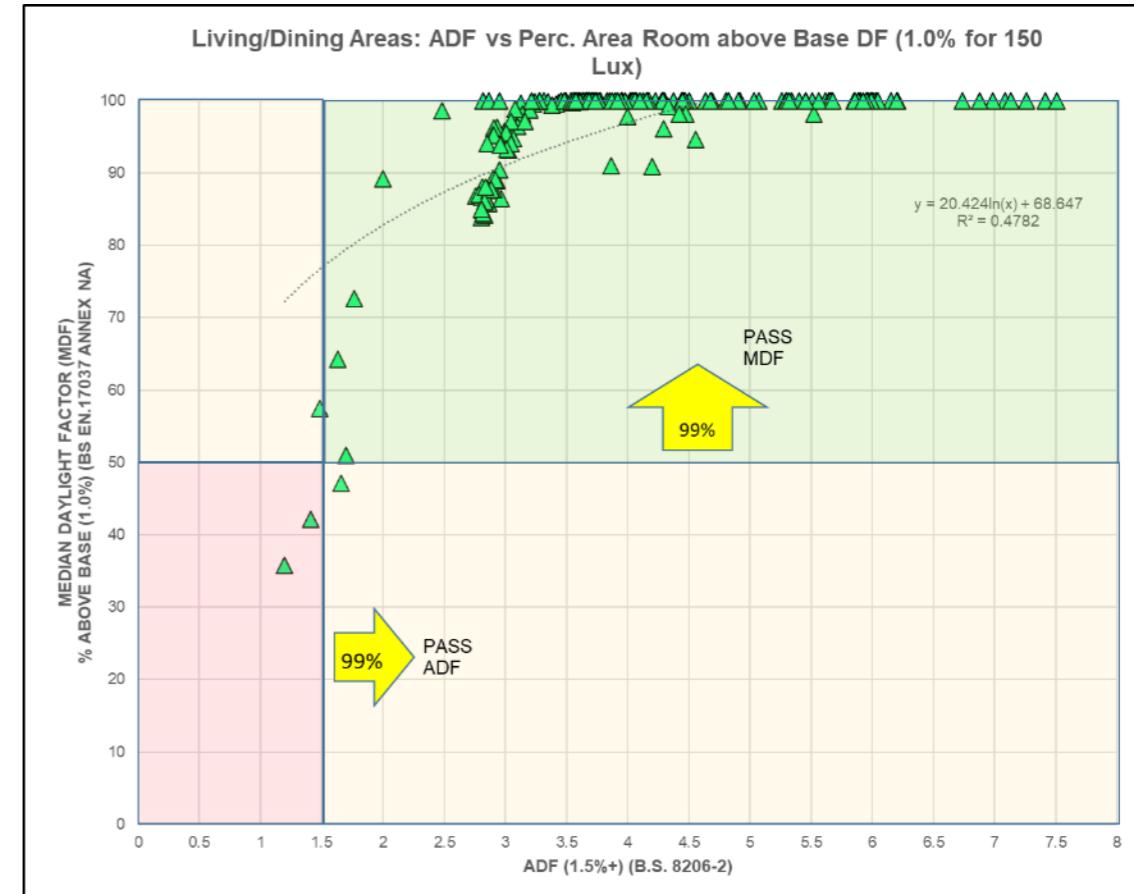


Fig A2: Compliance Comparison: ADF-v-MDF



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