



# Method Consulting

Intelligent engineering,  
sustainable buildings

Land to the west of Rodney Street, Manchester

Internal Daylighting Report

Wates Construction Ltd

June 2022

## Document History

This document has been revised and issued as below:

| Revision | Date     | Description                | Created by | Approved by |
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|          |          |                            |            |             |
|          |          |                            |            |             |
|          |          |                            |            |             |

## Executive Summary

An Internal Daylight Analysis for RIBA stage 3 was performed for the proposed residential development located at *Land to the west of Rodney Street, Manchester*, on behalf of the client, Wates Construction Ltd.

Daylight calculations were undertaken to assess compliance with AECB average daylight factor targets.

Based on the assumptions and methodology adopted, the development was modelled using dynamic simulation software RadianceIES with the following results:

- All relevant occupied spaces meet the required AECB average daylight factor criteria.

These results were based on the following key assumptions:

- Standard values for surface reflectance of 0.2, 0.5, 0.6, 0.8 and 0.8 for the ground, floor, external wall, internal walls, and ceiling respectively for each unit were used.
- A glazing transmittance of 71% has been applied to the glazing in the apartment blocks and townhouses, with the exception of four ground floor apartment living rooms where a higher transmittance of 75% has been specified.
- Additional design changes were proposed and approved by the design team in order to achieve compliance.
- A modelling scenario was tested assessing the impact of the *Internorm HF410* window selection on daylighting results for the worst-performing room. Compliance was shown to be achievable for the space with minor design changes, as specified in Appendix D.

## Contents

|   |                                                  |    |
|---|--------------------------------------------------|----|
| 1 | Introduction.....                                | 1  |
| 2 | Project Description .....                        | 1  |
| 3 | Planning policy context and project targets..... | 1  |
| 4 | Methodology .....                                | 3  |
| 5 | Daylighting Results .....                        | 11 |
| 6 | Conclusion .....                                 | 12 |
| 7 | Appendices .....                                 | 13 |

## 1 Introduction

Method Consulting LLP has been appointed to carry out an internal daylighting analysis of the proposed residential development located at Land to the west of Rodney Street, Manchester on behalf of the client, Wates Construction Ltd. This report has been written to summarise the process undertaken and to detail the results of the daylighting analysis; and is designed to contain all the necessary information for compliance with AECB average daylight factor targets.

## 2 Project Description

**Project:** This City residential development, Ancoats, Manchester

This City is a new kind of housing company, owned and run by Manchester City Council. They are a new venture that will develop high quality, low carbon housing for all Mancunians. The new homes will be a mix of market housing and homes designated for Manchester Living Rent (to be rented at or below Local Housing Allowance levels). Market housing will subsidise the provision of the Manchester Living Rent properties.

**Description of Development:** Erection of two residential apartment buildings (Use Class C3), one of 8 storeys (68 apartments) and one of 5 storeys (50 apartments), to form a total of 118 residential apartments; and erection of 10, 3 storey townhouses (Use Class C3); together with car and cycle parking provision, hard and soft landscaping including public realm, access, substation, and other associated works.

## 3 Planning policy context and project targets

### 3.1 National Planning Policy Framework (NPPF)

The NPPF does not make reference to internal daylight requirements.

### 3.2 Manchester Local Planning Requirements

Manchester City Council's Core Strategy 2012 to 2027 makes no direct reference to internal daylight requirements. Policy EN 4 states:

*“The Council will seek to reduce fuel poverty and decouple growth in the economy, growth in CO<sub>2</sub> emissions, and rising fossil fuel prices, through the following actions: All development must follow the principle of the Energy Hierarchy, being designed:*

- *to reduce the need for energy through design features that provide passive heating, **natural lighting**, and cooling.”*

The Core Strategy also states:

*“The Council is committed to the development of new housing which meets and where possible exceeds the current Code for Sustainable Homes requirements”*

The Code for Sustainable Homes has the following requirements:

| Relevant Space                                                                                                    | Criteria                                                               |
|-------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------|
| Kitchens                                                                                                          | Must achieve a minimum Average Daylight Factor of at <b>least 2%</b>   |
| All living rooms, dining rooms and studies (incl. any room designated as a home office under Ene 9 – Home Office) | Must achieve a minimum Average Daylight Factor <b>of at least 1.5%</b> |

*Table 3.2.1 Code for sustainable homes – Assessment criteria for HEA 1 Daylighting*

It is noted that while the Code for Sustainable Homes is included in the Core Strategy, it was withdrawn by the government in 2015 and is therefore outdated.

### 3.3 Association for Environment Conscious Building (AECB)

The development is targeting compliance with AECB Standard Average Daylight Factors (ADFs).

The AECB Daylight Standard states acceptable internal daylighting is achieved when the specified ADF is achieved for each habitable room. Table 3.3.1 lists the required ADF for the proposed development’s room types.

| Room                | Average Daylight factor (ADF) |
|---------------------|-------------------------------|
| Bedroom             | >1%                           |
| Living room         | >1.5%                         |
| Kitchen             | >2%                           |
| Living room/Kitchen | >2%                           |

*Table 3.3.1 Room specific Average Daylight Factor target for AECB Standard*

The AECB Daylighting Standard refers to BS 8206, which states:

*“in a space which combines a living room and a kitchen the minimum average daylight factor should be 2%”.*

Therefore, for combined kitchen/living rooms, the target has been taken as 2% for the whole space.

## 4 Methodology

Daylighting analysis was carried out using simulation software RadianceIES, Virtual Environment Version 2019.3.2.0, and the analysis was conducted by a qualified and competent person.

### 4.1 Geometry

The following drawings were used to set up the model in the Virtual Environment:

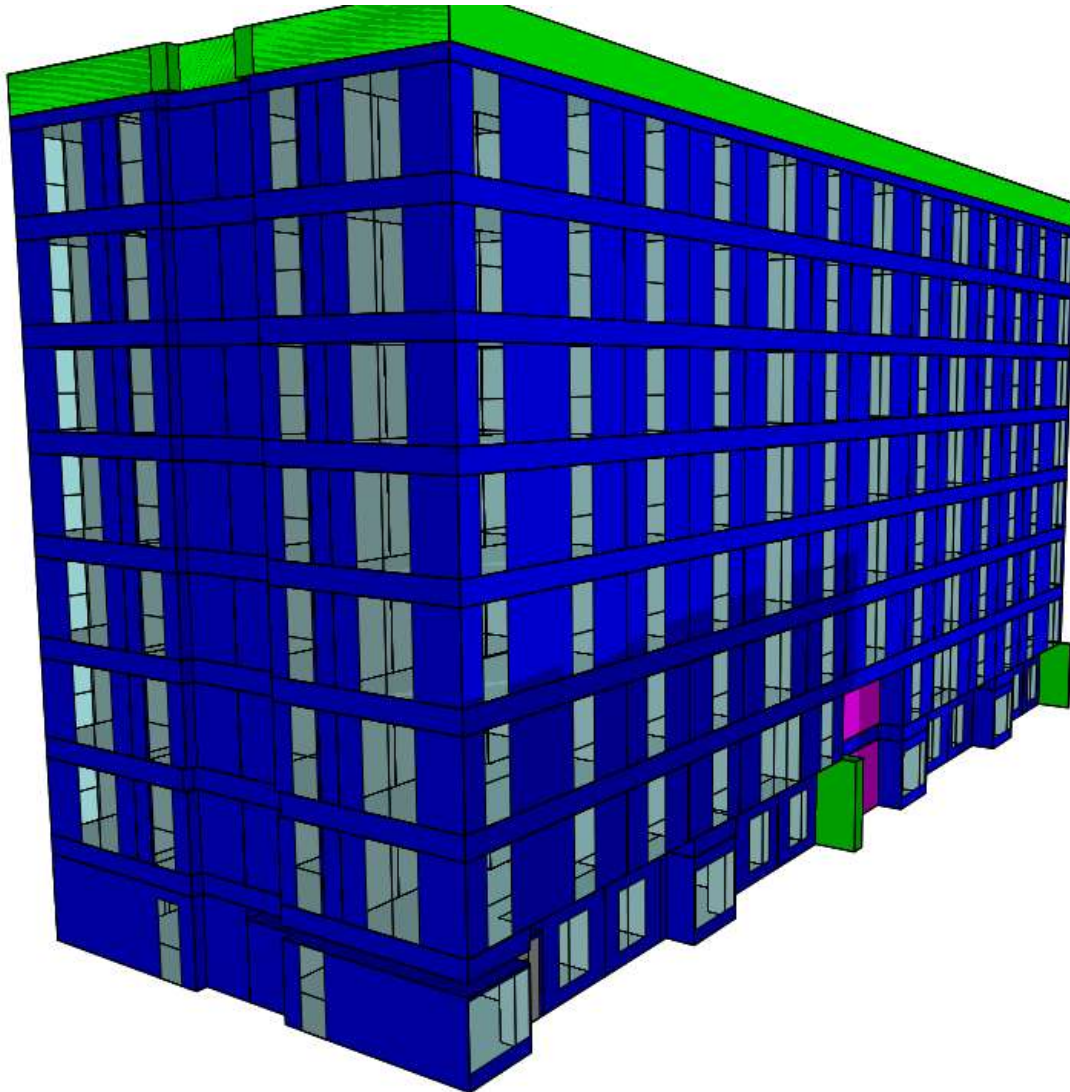
1. “RODSTA-BUT-B-ZZ-M-A-0003-Block B-S2- Issued for Information-P05\_LT\_03May2022\_110432.rvt” (received from Buttress architects – 3<sup>rd</sup> May 2022)
2. “RODSTA-BUT-A-ZZ-M-A-0002-Block A-S2- Issued for Information-P05.rvt” (received from Buttress architects – 3<sup>rd</sup> May 2022)
3. “RODSTA-BUT-TA-ZZ-M-A-0004-Townhouse Block A-S2-Issued for Information-P04.rvt” (received from Buttress architects – 3<sup>rd</sup> May 2022)
4. RODSTA-BUT-ZZ-ZZ-M-A-0001-Site-S2- Issued for Information-P03.rvt (received from Buttress architects – 3<sup>rd</sup> May 2022)

The following drawings were used for the purposes of room names only:

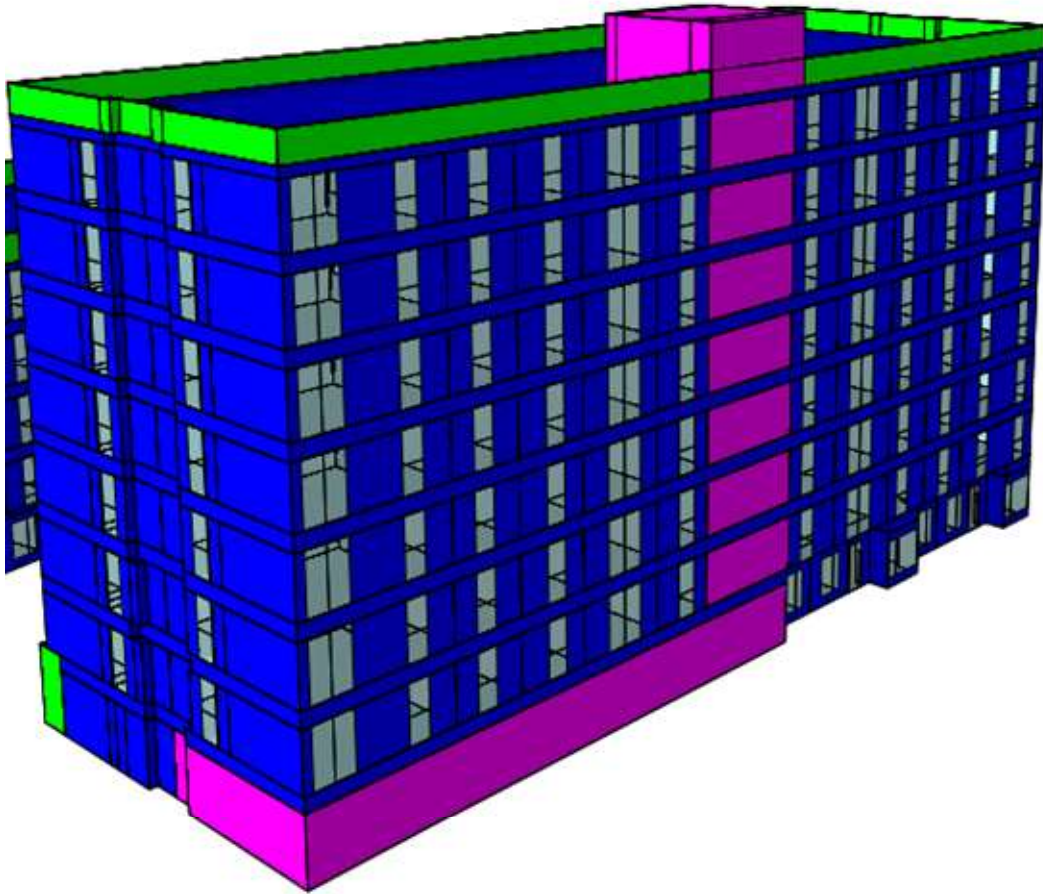
5. “RODSTA-BUT-A-00-DP-A-02105-Residential Block A.PDF”(received from Buttress architects – 5<sup>th</sup> April 2022)
6. “RODSTA-BUT-B-00-DP-A-02114-Residential Block B - Ground Floor Area Plan. PDF” (received from Buttress architects – 5<sup>th</sup> April 2022)

Additional changes were made to the model in consultation with the architects to improve daylighting and overheating results. Details of these changes are presented in Appendix C.

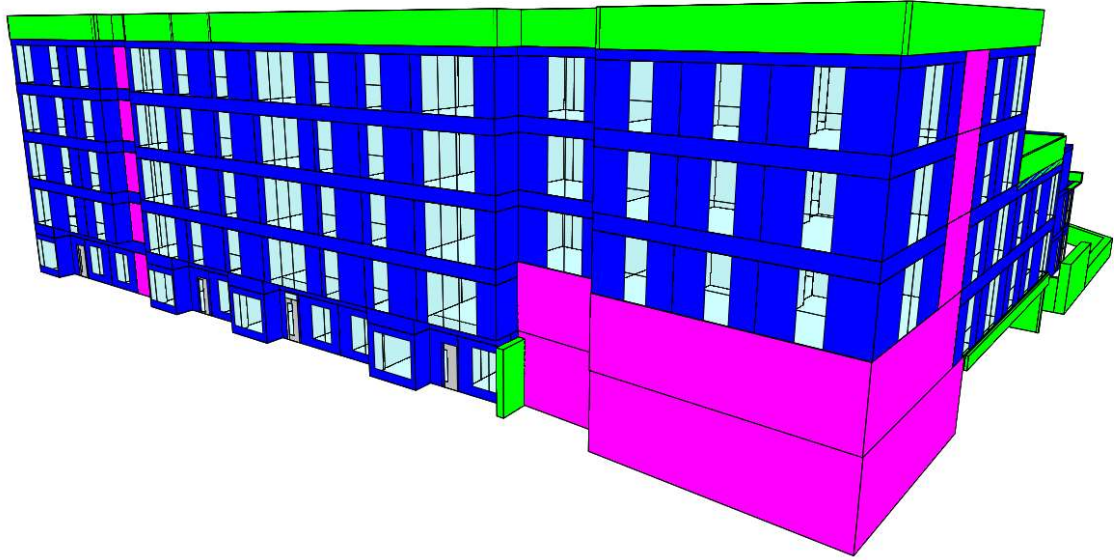
The constructed model is shown in Figure 4.1.1 to Figure 4.1.7.



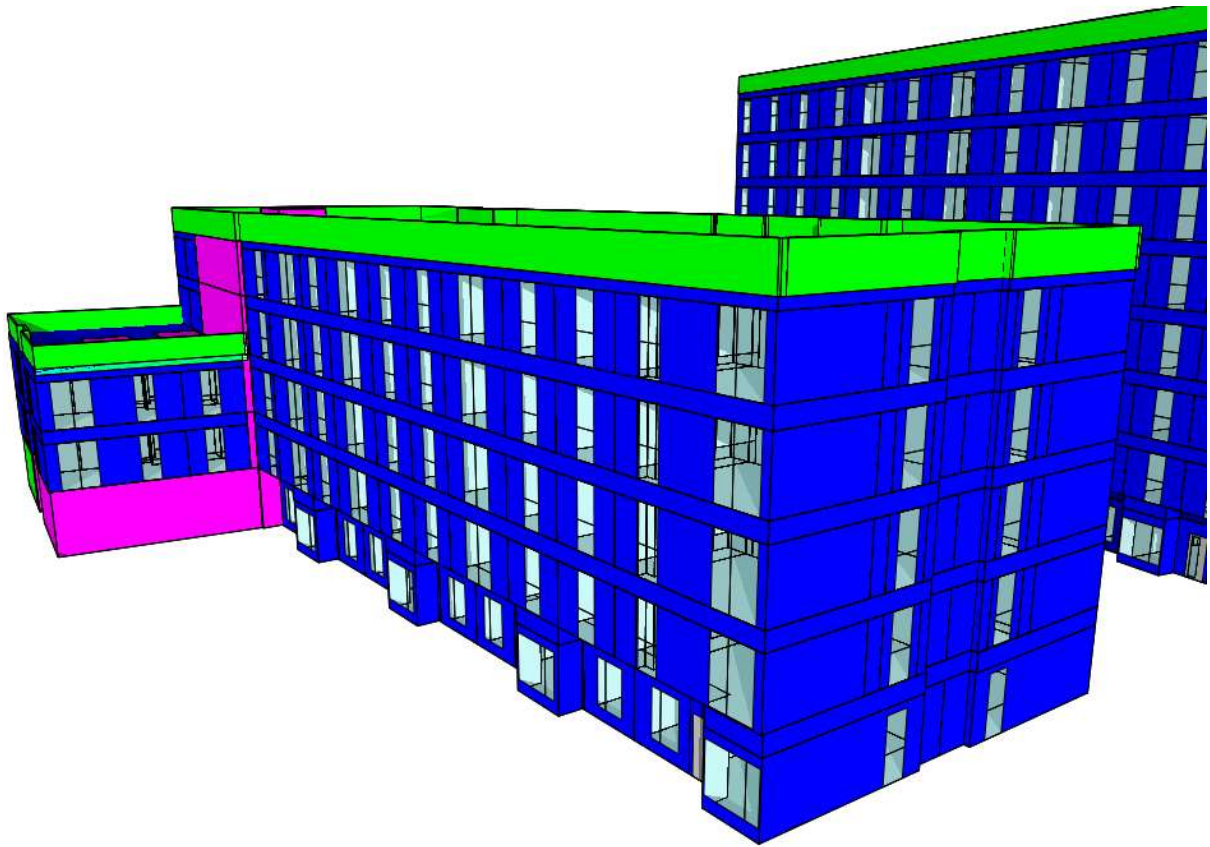
*Figure 4.1.1 IES virtual environment model of south façade of Block A*



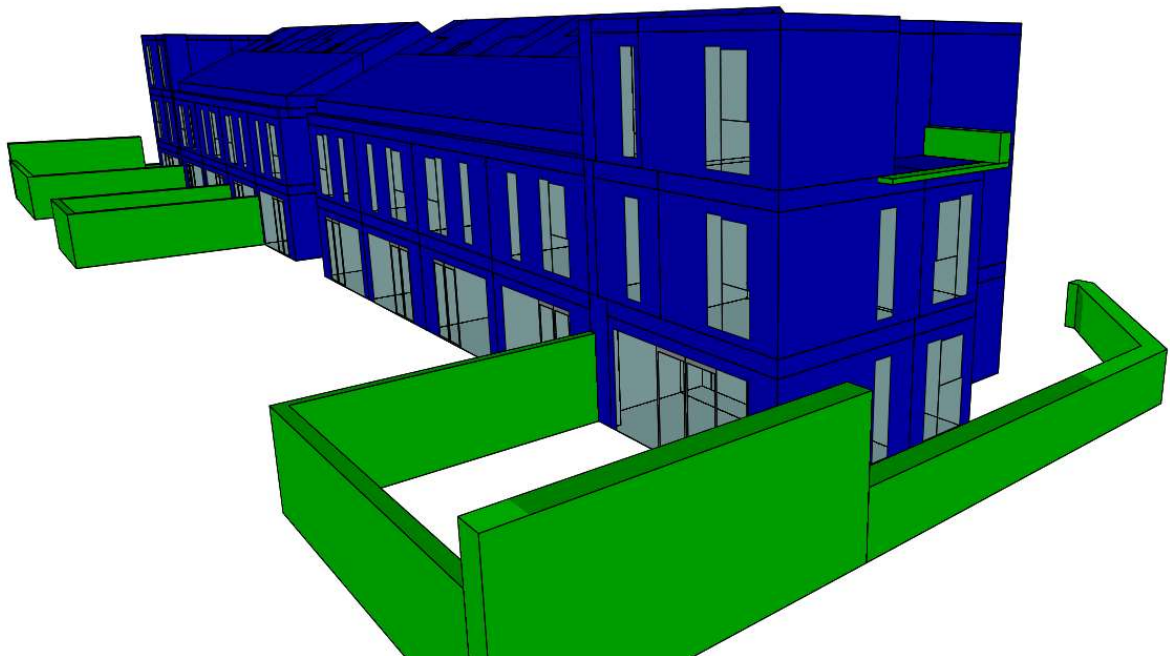
*Figure 4.1.2 IES virtual environment model of north façade of Block A*



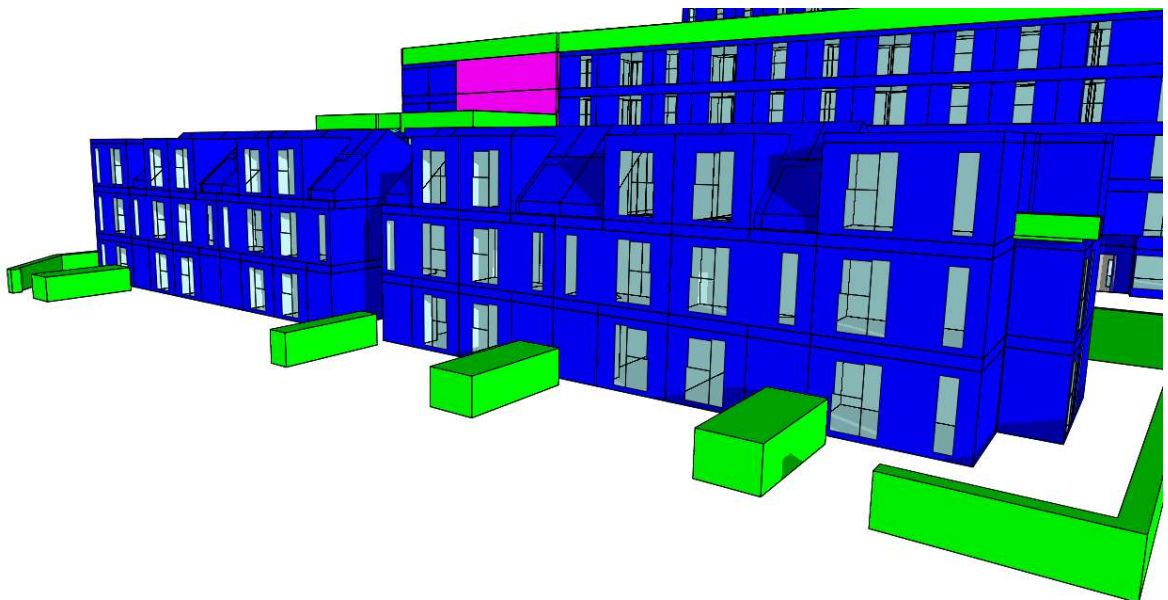
*Figure 4.1.3 IES virtual environment model of north façade of Block B*



*Figure 4.1.4: IES virtual environment model of south façade of Block B*



*Figure 4.1.5: IES virtual environment model of north façade of the townhouses*



*Figure 4.1.6: IES virtual environment model of south façade of the townhouses*

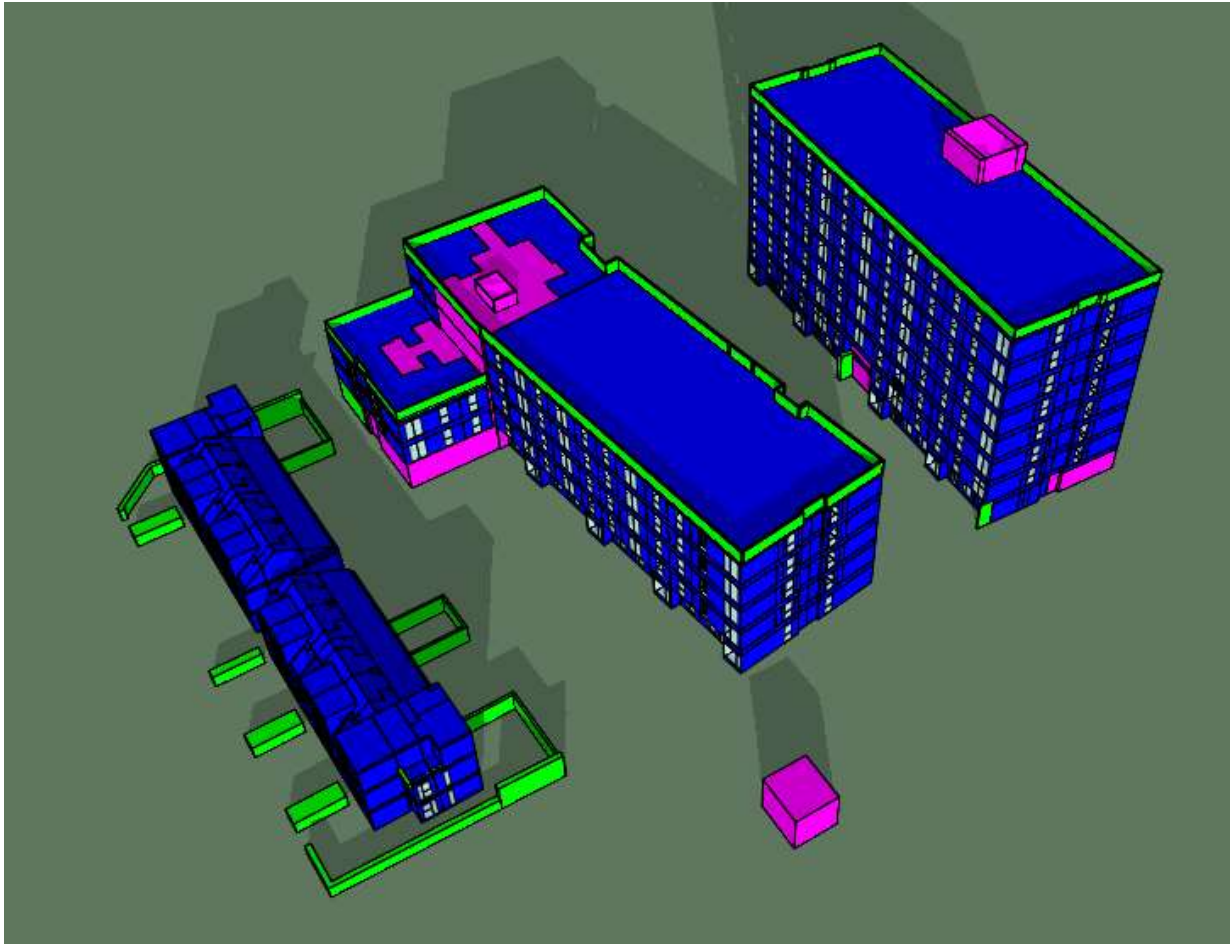


Figure 4.1.7: IES virtual environment model - Aerial view

As noted within the AECB Daylight Standard Calculator, *“no correction has been made for window reveals or courtyard type conditions (rooms with these conditions will receive less light).”*

The surrounding buildings not within the proposed development have been deemed to have negligible impact on Daylighting as they are not tall enough to obstruct daylight received and have thus not been modelled.

Future adjacent developments have not been factored into the calculations (albeit the only future development in immediate proximity to the site is the Lovells residential development that is under construction to the northeast, and the closest proposed properties are houses and therefore they will also not be tall enough to obstruct daylight received).

No trees were assumed within the model. This is partly because their shapes are almost impossible to predict, and partly because the dappled shade of a tree is more pleasant than the deep shadow of a building (this applies especially to deciduous trees).

A frame width of 50mm was used for all windows in the apartment blocks. The vision panels were modelled with enlarged glazed areas to account for the lack of frame. A similar methodology was used in the townhouses, where a uniform frame width of 50mm was used, and windows with a greater frame width (to accommodate operable windows) were modelled with a reduced glazed area. An additional modelling scenario was tested assessing the impact of the *Internorm HF410* window selection on daylighting results for the worst-performing room. Compliance was shown to be achievable for the space with minor design changes, as specified in Appendix D.

Wardrobes have been assumed open with no doors fixed. If assumed closed or with mirrored doors, the ADF will likely improve or remain similar to current results.

Circulation and cupboard spaces within apartments were not included in the assessed area.

## 4.2 Daylighting

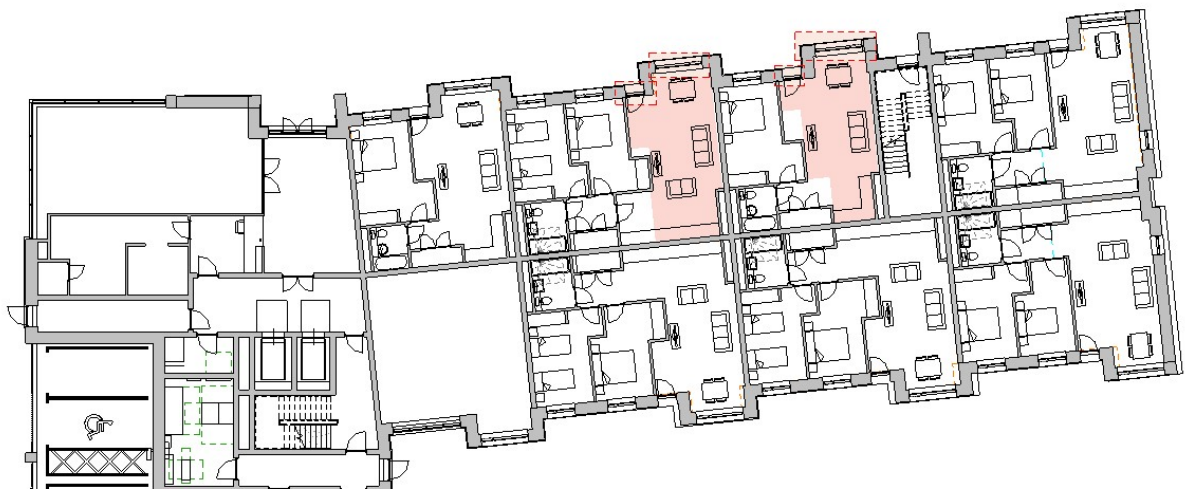
To demonstrate compliance with AECB Average Daylight Factor criteria, simulations have been run to determine the average daylight factor using the following assumptions and inputs shown in Table 4.2.1.

| Surface                                                                                            | Reflectance   |
|----------------------------------------------------------------------------------------------------|---------------|
| External wall (int)                                                                                | 0.8           |
| External wall (Ext)                                                                                | 0.6           |
| Internal wall                                                                                      | 0.8           |
| Internal Floor                                                                                     | 0.5           |
| Ceiling                                                                                            | 0.8           |
| Roof (internal)                                                                                    | 0.8           |
| Windows frame(50mm)                                                                                | 0.5           |
| Ground (earth)                                                                                     | 0.2           |
| Windows                                                                                            | Transmittance |
| Glazing (Type 1)                                                                                   | 0.71          |
| Glazing (Type 2 - Used for highlighted ground floor living rooms in Figure 4.2.1 and Figure 4.2.2) | 0.75          |
| Heights                                                                                            | Height (m)    |
| Floor to suspended ceiling height (Block A) - Ground floor                                         | 2.7           |
| Floor to suspended ceiling height (Block B) - Ground floor                                         | 2.6           |
| Floor to suspended ceiling height (Apartment blocks) - Upper floors                                | 2.35          |
| Floor to suspended ceiling height (Townhouses)                                                     | 2.5           |
| Working plane Height                                                                               | 0.85          |

Table 4.2.1 Assumptions and Inputs used for Daylight Factor calculations



*Figure 4.2.1 Rooms requiring higher transmittance glazing (Block A, ground floor)*



*Figure 4.2.2 Rooms requiring higher transmittance glazing (Block B, ground floor)*

## 5 Daylighting Results

A summary of the internal daylighting analysis results is shown in Table 5.1, and a detailed analysis is in Appendix A.

| Occupied Spaces                | AECB target (%) | Total No. rooms | Passing AECB target |             |
|--------------------------------|-----------------|-----------------|---------------------|-------------|
|                                |                 |                 | No. rooms           | % rooms     |
| Block A - Living/kitchen rooms | 2.00            | 68              | 68                  | 100%        |
| Block A - Bedrooms             | 1.00            | 124             | 124                 | 100%        |
| <b>Block A Total</b>           | -               | <b>192</b>      | <b>192</b>          | <b>100%</b> |
| Block B - Living/kitchen rooms | 2.00            | 50              | 50                  | 100%        |
| Block B - Bedrooms             | 1.00            | 85              | 85                  | 100%        |
| <b>Block B - Total</b>         | -               | <b>135</b>      | <b>135</b>          | <b>100%</b> |
| <b>Apartments - Total</b>      | -               | <b>327</b>      | <b>327</b>          | <b>100%</b> |
| Townhouses - Kitchen/dining    | 2.00            | 2               | 2                   | 100%        |
| Townhouses - Living            | 1.50            | 2               | 2                   | 100%        |
| Townhouses - Living/kitchen    | 2.00            | 8               | 8                   | 100%        |
| Townhouses - Bedrooms          | 1.00            | 32              | 32                  | 100%        |
| <b>Townhouses - Total</b>      | -               | <b>44</b>       | <b>44</b>           | <b>100%</b> |
| <b>TOTAL ROOMS</b>             | -               | <b>371</b>      | <b>371</b>          | <b>100%</b> |
| Bedrooms                       | 1.00            | 241             | 241                 | 100%        |
| Living/Kitchen                 | 2.00            | 126             | 126                 | 100%        |
| Kitchen /Dining                | 2.00            | 2               | 2                   | 100%        |
| Living                         | 1.50            | 2               | 2                   | 100%        |

Table 5.1 Summary of Daylight Factor results for the proposed development

The results indicate that all occupied spaces meet the AECB Average Daylight Factor targets.

Daylight factor visualisation of sample rooms daylight factor for the building can be seen in Appendix B.

### 5.1 Juliet balcony railings

Juliet balcony railings were not modelled in the overall model. In order to assess the impact of the shading from the balcony railings, an additional model was constructed of a sample room, including the balcony railings as shown in Appendix C. The sample room selected was the worst-performing room from the overall model to have a Juliet balcony.

The results of the study are shown in Table 5.1.1. It was found that the room achieved the AECB target for average daylight factor when the balcony railings were included, hence it is assumed all other rooms with balconies will also pass.

| Floor | Room Numbers                   | Average Daylight factor (%) |               |             |                                                   |
|-------|--------------------------------|-----------------------------|---------------|-------------|---------------------------------------------------|
|       |                                | Without railings            | With railings | % Reduction | Comments                                          |
| A02   | A02: Flat 006 - Living/Kitchen | 2.2                         | 2.02          | 8%          | 10mm bars at 95 mm apart assumed to 1.015m height |

*Table 5.1.1 Impact of balcony railings on daylight factor for sample room.*

## 6 Conclusion

An Internal Daylight Analysis for RIBA stage 3 was performed for the proposed residential development located at *Land to the west of Rodney Street, Manchester*, on behalf of the client, Wates Construction Ltd.

Daylight calculations were undertaken to assess compliance with AECB average daylight factor targets.

Based on the assumptions and methodology adopted, the development was modelled using dynamic simulation software RadianceIES with the following results:

- All relevant occupied spaces meet the required AECB average daylight factor criteria.

## 7 Appendices

### 7.1 Appendix A – Average daylight factor for all assessed spaces

The following tables present the average daylight results for all occupied spaces.

The tables utilise the colour code:

| TARGET REACHED | Colour code meaning             |
|----------------|---------------------------------|
| PASS           | Exceeds target by at least 10%  |
| PASS           | Exceeds target by less than 10% |
| FAIL           | Does not meet target            |

### 7.1.1 *BLOCK A*

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments                                                  |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|-----------------------------------------------------------|
| A00: Flat 002 - Bedroom 1      | A00   | Bedroom        | 1.00            | 3.72                        | PASS                |                                                           |
| A00: Flat 002 - Bedroom 2      | A00   | Bedroom        | 1.00            | 4.34                        | PASS                |                                                           |
| A00: Flat 002 - Living/Kitchen | A00   | Living/Kitchen | 2.00            | 4.22                        | PASS                |                                                           |
| A00: Flat 003 - Bedroom 1      | A00   | Bedroom        | 1.00            | 3.83                        | PASS                |                                                           |
| A00: Flat 003 - Bedroom 2      | A00   | Bedroom        | 1.00            | 3.96                        | PASS                |                                                           |
| A00: Flat 003 - Living/Kitchen | A00   | Living         | 2.00            | 3.26                        | PASS                |                                                           |
| A00: Flat 004 - Bedroom 1      | A00   | Bedroom        | 1.00            | 2.7                         | PASS                |                                                           |
| A00: Flat 004 - Bedroom 2      | A00   | Bedroom        | 1.00            | 2.7                         | PASS                |                                                           |
| A00: Flat 004 - Living/Kitchen | A00   | Living         | 2.00            | 3.58                        | PASS                |                                                           |
| A00: Flat 005 - Bedroom 1      | A00   | Bedroom        | 1.00            | 2.26                        | PASS                |                                                           |
| A00: Flat 005 - Bedroom 2      | A00   | Bedroom        | 1.00            | 2.4                         | PASS                |                                                           |
| A00: Flat 005 - Living/Kitchen | A00   | Living/Kitchen | 2.00            | 2.09                        | PASS                | 2.23% achievable with higher glazing transmittance of 75% |
| A00: Flat 006 - Bedroom 1      | A00   | Bedroom        | 1.00            | 2.25                        | PASS                |                                                           |
| A00: Flat 006 - Bedroom 2      | A00   | Bedroom        | 1.00            | 2.25                        | PASS                |                                                           |
| A00: Flat 006 - Living/Kitchen | A00   | Living/Kitchen | 2.00            | 2.03                        | PASS                | Higher Transmittance glazing used: 75%                    |
| A00: Flat 007 - Bedroom 1      | A00   | Bedroom        | 1.00            | 2.39                        | PASS                |                                                           |
| A00: Flat 007 - Bedroom 2      | A00   | Bedroom        | 1.00            | 2.85                        | PASS                |                                                           |
| A00: Flat 007 - Living/Kitchen | A00   | Living/Kitchen | 2.00            | 2.08                        | PASS                | Higher Transmittance glazing used: 75%                    |
| A01: Flat 001 - Bedroom 1      | A01   | Bedroom        | 1.00            | 2.72                        | PASS                |                                                           |
| A01: Flat 001 - Bedroom 2      | A01   | Bedroom        | 1.00            | 3.6                         | PASS                |                                                           |
| A01: Flat 001 - Living/Kitchen | A01   | Living/Kitchen | 2.00            | 6.25                        | PASS                |                                                           |
| A01: Flat 002 - Bedroom 1      | A01   | Bedroom        | 1.00            | 3.55                        | PASS                |                                                           |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| A01: Flat 002 - Bedroom 2      | A01   | Bedroom        | 1.00            | 3.78                        | PASS                |          |
| A01: Flat 002 - Living/Kitchen | A01   | Living/Kitchen | 2.00            | 3.05                        | PASS                |          |
| A01: Flat 003 - Bedroom 1      | A01   | Bedroom        | 1.00            | 3.5                         | PASS                |          |
| A01: Flat 003 - Bedroom 2      | A01   | Bedroom        | 1.00            | 3.8                         | PASS                |          |
| A01: Flat 003 - Living/Kitchen | A01   | Living/Kitchen | 2.00            | 3.04                        | PASS                |          |
| A01: Flat 004 - Bedroom 1      | A01   | Bedroom        | 1.00            | 2.50                        | PASS                |          |
| A01: Flat 004 - Bedroom 2      | A01   | Bedroom        | 1.00            | 3.56                        | PASS                |          |
| A01: Flat 004 - Living/Kitchen | A01   | Living/Kitchen | 2.00            | 4.93                        | PASS                |          |
| A01: Flat 005 - Bedroom 1      | A01   | Bedroom        | 1.00            | 2.48                        | PASS                |          |
| A01: Flat 005 - Bedroom 2      | A01   | Bedroom        | 1.00            | 2.39                        | PASS                |          |
| A01: Flat 005 - Living/Kitchen | A01   | Living/Kitchen | 2.00            | 3.73                        | PASS                |          |
| A01: Flat 006 - Bedroom 1      | A01   | Bedroom        | 1.00            | 2.49                        | PASS                |          |
| A01: Flat 006 - Bedroom 2      | A01   | Bedroom        | 1.00            | 2.77                        | PASS                |          |
| A01: Flat 006 - Living/Kitchen | A01   | Living/Kitchen | 2.00            | 2.84                        | PASS                |          |
| A01: Flat 007 - Bedroom 1      | A01   | Bedroom        | 1.00            | 2.51                        | PASS                |          |
| A01: Flat 007 - Bedroom 2      | A01   | Bedroom        | 1.00            | 2.86                        | PASS                |          |
| A01: Flat 007 - Living/Kitchen | A01   | Living/Kitchen | 2.00            | 2.86                        | PASS                |          |
| A01: Flat 008 - Bedroom 1      | A01   | Bedroom        | 1.00            | 2.73                        | PASS                |          |
| A01: Flat 008 - Bedroom 2      | A01   | Bedroom        | 1.00            | 2.78                        | PASS                |          |
| A01: Flat 008 - Living/Kitchen | A01   | Living/Kitchen | 2.00            | 5.7                         | PASS                |          |
| A02: Flat 001 - Bedroom 1      | A02   | Bedroom        | 1.00            | 2.34                        | PASS                |          |
| A02: Flat 001 - Bedroom 2      | A02   | Bedroom        | 1.00            | 3.6                         | PASS                |          |
| A02: Flat 001 -Living/Kitchen  | A02   | Living/Kitchen | 2.00            | 6.24                        | PASS                |          |
| A02: Flat 002 - Bedroom 1      | A02   | Bedroom        | 1.00            | 3.56                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments                                             |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|------------------------------------------------------|
| A02: Flat 002 - Bedroom 2      | A02   | Bedroom        | 1.00            | 3.78                        | PASS                |                                                      |
| A02: Flat 002 - Living/Kitchen | A02   | Living/Kitchen | 2.00            | 3.05                        | PASS                |                                                      |
| A02: Flat 003 - Bedroom 1      | A02   | Bedroom        | 1.00            | 3.52                        | PASS                |                                                      |
| A02: Flat 003 - Bedroom 2      | A02   | Bedroom        | 1.00            | 3.81                        | PASS                |                                                      |
| A02: Flat 003 - Living/Kitchen | A02   | Living/Kitchen | 2.00            | 3.05                        | PASS                |                                                      |
| A02: Flat 004 - Bedroom 1      | A02   | Bedroom        | 1.00            | 2.51                        | PASS                |                                                      |
| A02: Flat 004 - Bedroom 2      | A02   | Bedroom        | 1.00            | 3.56                        | PASS                |                                                      |
| A02: Flat 004 - Living/Kitchen | A02   | Living/Kitchen | 2.00            | 4.92                        | PASS                |                                                      |
| A02: Flat 005 - Bedroom 1      | A02   | Bedroom        | 1.00            | 2.48                        | PASS                |                                                      |
| A02: Flat 005 - Bedroom 2      | A02   | Bedroom        | 1.00            | 2.63                        | PASS                |                                                      |
| A02: Flat 005 - Living/Kitchen | A02   | Living/Kitchen | 2.00            | 3.98                        | PASS                |                                                      |
| A02: Flat 006 - Bedroom 1      | A02   | Bedroom        | 1.00            | 2.79                        | PASS                |                                                      |
| A02: Flat 006 - Bedroom 2      | A02   | Bedroom        | 1.00            | 3.08                        | PASS                |                                                      |
| A02: Flat 006 - Living/Kitchen | A02   | Living/Kitchen | 2.00            | 2.2                         | PASS                | 2.02% when taking balcony railing into consideration |
| A02: Flat 007 - Bedroom 1      | A02   | Bedroom        | 1.00            | 3.11                        | PASS                |                                                      |
| A02: Flat 007 - Living/Kitchen | A02   | Living/Kitchen | 2.00            | 2.46                        | PASS                |                                                      |
| A02: Flat 008 - Bedroom 1      | A02   | Bedroom        | 1.00            | 2.79                        | PASS                |                                                      |
| A02: Flat 008 - Living/Kitchen | A02   | Living/Kitchen | 2.00            | 2.54                        | PASS                |                                                      |
| A02: Flat 009 - Bedroom 1      | A02   | Bedroom        | 1.00            | 2.57                        | PASS                |                                                      |
| A02: Flat 009 - Bedroom 2      | A02   | Bedroom        | 1.00            | 2.96                        | PASS                |                                                      |
| A02: Flat 009 - Living/Kitchen | A02   | Living/Kitchen | 2.00            | 5.86                        | PASS                |                                                      |
| A03: Flat 001 - Bedroom 1      | A03   | Bedroom        | 1.00            | 2.72                        | PASS                |                                                      |
| A03: Flat 001 - Bedroom 2      | A03   | Bedroom        | 1.00            | 3.6                         | PASS                |                                                      |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| A03: Flat 001 - Living/Kitchen | A03   | Living/Kitchen | 2.00            | 6.24                        | PASS                |          |
| A03: Flat 002 - Bedroom 1      | A03   | Bedroom        | 1.00            | 3.57                        | PASS                |          |
| A03: Flat 002 - Bedroom 2      | A03   | Bedroom        | 1.00            | 3.79                        | PASS                |          |
| A03: Flat 002 - Living/Kitchen | A03   | Living/Kitchen | 2.00            | 3.02                        | PASS                |          |
| A03: Flat 003 - Bedroom 1      | A03   | Bedroom        | 1.00            | 3.51                        | PASS                |          |
| A03: Flat 003 - Bedroom 2      | A03   | Bedroom        | 1.00            | 3.79                        | PASS                |          |
| A03: Flat 003 - Living/Kitchen | A03   | Living/Kitchen | 2.00            | 3.04                        | PASS                |          |
| A03: Flat 004 - Bedroom 1      | A03   | Bedroom        | 1.00            | 2.52                        | PASS                |          |
| A03: Flat 004 - Bedroom 2      | A03   | Bedroom        | 1.00            | 3.56                        | PASS                |          |
| A03: Flat 004 - Living/Kitchen | A03   | Living/Kitchen | 2.00            | 4.92                        | PASS                |          |
| A03: Flat 005 - Bedroom 1      | A03   | Bedroom        | 1.00            | 2.49                        | PASS                |          |
| A03: Flat 005 - Bedroom 2      | A03   | Bedroom        | 1.00            | 2.9                         | PASS                |          |
| A03: Flat 005 - Living/Kitchen | A03   | Living/Kitchen | 2.00            | 4.27                        | PASS                |          |
| A03: Flat 006 - Bedroom 1      | A03   | Bedroom        | 1.00            | 3.06                        | PASS                |          |
| A03: Flat 006 - Bedroom 2      | A03   | Bedroom        | 1.00            | 3.36                        | PASS                |          |
| A03: Flat 006 - Living/Kitchen | A03   | Living/Kitchen | 2.00            | 2.4                         | PASS                |          |
| A03: Flat 007 - Bedroom 1      | A03   | Bedroom        | 1.00            | 3.37                        | PASS                |          |
| A03: Flat 007 - Living/Kitchen | A03   | Living/Kitchen | 2.00            | 2.7                         | PASS                |          |
| A03: Flat 008 - Bedroom 1      | A03   | Bedroom        | 1.00            | 2.99                        | PASS                |          |
| A03: Flat 008 - Living/Kitchen | A03   | Living/Kitchen | 2.00            | 2.76                        | PASS                |          |
| A03: Flat 009 - Bedroom 1      | A03   | Bedroom        | 1.00            | 2.55                        | PASS                |          |
| A03: Flat 009 - Bedroom 2      | A03   | Bedroom        | 1.00            | 3.15                        | PASS                |          |
| A03: Flat 009 - Living/Kitchen | A03   | Living/Kitchen | 2.00            | 6.00                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| A04: Flat 001 - Bedroom 1      | A04   | Bedroom        | 1.00            | 2.72                        | PASS                |          |
| A04: Flat 001 - Bedroom 2      | A04   | Bedroom        | 1.00            | 3.6                         | PASS                |          |
| A04: Flat 001 - Living/Kitchen | A04   | Living/Kitchen | 2.00            | 6.24                        | PASS                |          |
| A04: Flat 002 - Bedroom 1      | A04   | Bedroom        | 1.00            | 3.56                        | PASS                |          |
| A04: Flat 002 - Bedroom 2      | A04   | Bedroom        | 1.00            | 3.78                        | PASS                |          |
| A04: Flat 002 - Living/Kitchen | A04   | Living/Kitchen | 2.00            | 3.01                        | PASS                |          |
| A04: Flat 003 - Bedroom 1      | A04   | Bedroom        | 1.00            | 3.51                        | PASS                |          |
| A04: Flat 003 - Bedroom 2      | A04   | Bedroom        | 1.00            | 3.8                         | PASS                |          |
| A04: Flat 003 - Living/Kitchen | A04   | Living/Kitchen | 2.00            | 3.03                        | PASS                |          |
| A04: Flat 004 - Bedroom 1      | A04   | Bedroom        | 1.00            | 2.51                        | PASS                |          |
| A04: Flat 004 - Bedroom 2      | A04   | Bedroom        | 1.00            | 3.56                        | PASS                |          |
| A04: Flat 004 - Living/Kitchen | A04   | Living/Kitchen | 2.00            | 4.92                        | PASS                |          |
| A04: Flat 005 - Bedroom 1      | A04   | Bedroom        | 1.00            | 2.48                        | PASS                |          |
| A04: Flat 005 - Bedroom 2      | A04   | Bedroom        | 1.00            | 3.11                        | PASS                |          |
| A04: Flat 005 - Living/Kitchen | A04   | Living/Kitchen | 2.00            | 4.53                        | PASS                |          |
| A04: Flat 006 - Bedroom 1      | A04   | Bedroom        | 1.00            | 3.26                        | PASS                |          |
| A04: Flat 006 - Bedroom 2      | A04   | Bedroom        | 1.00            | 3.58                        | PASS                |          |
| A04: Flat 006 - Living/Kitchen | A04   | Living/Kitchen | 2.00            | 2.61                        | PASS                |          |
| A04: Flat 007 - Bedroom 1      | A04   | Bedroom        | 1.00            | 3.55                        | PASS                |          |
| A04: Flat 007 - Living/Kitchen | A04   | Living/Kitchen | 2.00            | 2.89                        | PASS                |          |
| A04: Flat 008 - Bedroom 1      | A04   | Bedroom        | 1.00            | 3.12                        | PASS                |          |
| A04: Flat 008 - Living/Kitchen | A04   | Living/Kitchen | 2.00            | 2.94                        | PASS                |          |
| A04: Flat 009 - Bedroom 1      | A04   | Bedroom        | 1.00            | 2.55                        | PASS                |          |
| A04: Flat 009 - Bedroom 2      | A04   | Bedroom        | 1.00            | 3.28                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| A04: Flat 009 - Living/Kitchen | A04   | Living/Kitchen | 2.00            | 6.10                        | PASS                |          |
| A05: Flat 001 - Bedroom 1      | A05   | Bedroom        | 1.00            | 2.72                        | PASS                |          |
| A05: Flat 001 - Bedroom 2      | A05   | Bedroom        | 1.00            | 3.61                        | PASS                |          |
| A05: Flat 001 - Living/Kitchen | A05   | Living/Kitchen | 2.00            | 6.25                        | PASS                |          |
| A05: Flat 002 - Bedroom 1      | A05   | Bedroom        | 1.00            | 3.56                        | PASS                |          |
| A05: Flat 002 - Bedroom 2      | A05   | Bedroom        | 1.00            | 3.79                        | PASS                |          |
| A05: Flat 002 - Living/Kitchen | A05   | Living/Kitchen | 2.00            | 3.02                        | PASS                |          |
| A05: Flat 003 - Bedroom 1      | A05   | Bedroom        | 1.00            | 3.52                        | PASS                |          |
| A05: Flat 003 - Bedroom 2      | A05   | Bedroom        | 1.00            | 3.79                        | PASS                |          |
| A05: Flat 003 - Living/Kitchen | A05   | Living/Kitchen | 2.00            | 3.04                        | PASS                |          |
| A05: Flat 004 - Bedroom 1      | A05   | Bedroom        | 1.00            | 2.52                        | PASS                |          |
| A05: Flat 004 - Bedroom 2      | A05   | Bedroom        | 1.00            | 3.55                        | PASS                |          |
| A05: Flat 004 - Living/Kitchen | A05   | Living/Kitchen | 2.00            | 4.93                        | PASS                |          |
| A05: Flat 005 - Bedroom 1      | A05   | Bedroom        | 1.00            | 2.46                        | PASS                |          |
| A05: Flat 005 - Bedroom 2      | A05   | Bedroom        | 1.00            | 3.2                         | PASS                |          |
| A05: Flat 005 - Living/Kitchen | A05   | Living/Kitchen | 2.00            | 4.66                        | PASS                |          |
| A05: Flat 006 - Bedroom 1      | A05   | Bedroom        | 1.00            | 3.36                        | PASS                |          |
| A05: Flat 006 - Bedroom 2      | A05   | Bedroom        | 1.00            | 3.68                        | PASS                |          |
| A05: Flat 006 - Living/Kitchen | A05   | Living/Kitchen | 2.00            | 2.72                        | PASS                |          |
| A05: Flat 007 - Bedroom 1      | A05   | Bedroom        | 1.00            | 3.64                        | PASS                |          |
| A05: Flat 007 - Living/Kitchen | A05   | Living/Kitchen | 2.00            | 3.00                        | PASS                |          |
| A05: Flat 008 - Bedroom 1      | A05   | Bedroom        | 1.00            | 3.17                        | PASS                |          |
| A05: Flat 008 - Living/Kitchen | A05   | Living/Kitchen | 2.00            | 3.03                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| A05: Flat 009 - Bedroom 1      | A05   | Bedroom        | 1.00            | 2.56                        | PASS                |          |
| A05: Flat 009 - Bedroom 2      | A05   | Bedroom        | 1.00            | 3.34                        | PASS                |          |
| A05: Flat 009 - Living/Kitchen | A05   | Living/Kitchen | 2.00            | 6.15                        | PASS                |          |
| A06: Flat 001 - Bedroom 1      | A06   | Bedroom        | 1.00            | 2.72                        | PASS                |          |
| A06: Flat 001 - Bedroom 2      | A06   | Bedroom        | 1.00            | 3.61                        | PASS                |          |
| A06: Flat 001 - Living/Kitchen | A06   | Living/Kitchen | 2.00            | 6.24                        | PASS                |          |
| A06: Flat 002 - Bedroom 1      | A06   | Bedroom        | 1.00            | 3.56                        | PASS                |          |
| A06: Flat 002 - Bedroom 2      | A06   | Bedroom        | 1.00            | 3.79                        | PASS                |          |
| A06: Flat 002 - Living/Kitchen | A06   | Living/Kitchen | 2.00            | 3.01                        | PASS                |          |
| A06: Flat 003 - Bedroom 1      | A06   | Bedroom        | 1.00            | 3.51                        | PASS                |          |
| A06: Flat 003 - Bedroom 2      | A06   | Bedroom        | 1.00            | 3.8                         | PASS                |          |
| A06: Flat 003 - Living/Kitchen | A06   | Living/Kitchen | 2.00            | 3.04                        | PASS                |          |
| A06: Flat 004 - Bedroom 1      | A06   | Bedroom        | 1.00            | 2.51                        | PASS                |          |
| A06: Flat 004 - Bedroom 2      | A06   | Bedroom        | 1.00            | 3.56                        | PASS                |          |
| A06: Flat 004 - Living/Kitchen | A06   | Living/Kitchen | 2.00            | 4.93                        | PASS                |          |
| A06: Flat 005 - Bedroom 1      | A06   | Bedroom        | 1.00            | 2.48                        | PASS                |          |
| A06: Flat 005 - Bedroom 2      | A06   | Bedroom        | 1.00            | 3.22                        | PASS                |          |
| A06: Flat 005 - Living/Kitchen | A06   | Living/Kitchen | 2.00            | 4.69                        | PASS                |          |
| A06: Flat 006 - Bedroom 1      | A06   | Bedroom        | 1.00            | 3.37                        | PASS                |          |
| A06: Flat 006 - Bedroom 2      | A06   | Bedroom        | 1.00            | 3.72                        | PASS                |          |
| A06: Flat 006 - Living/        | A06   | Living/Kitchen | 2.00            | 2.76                        | PASS                |          |
| A06: Flat 007 - Bedroom 1      | A06   | Bedroom        | 1.00            | 3.65                        | PASS                |          |
| A06: Flat 007 - Living/Kitchen | A06   | Living/Kitchen | 2.00            | 3.02                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| A06: Flat 008 - Bedroom 1      | A06   | Bedroom        | 1.00            | 3.20                        | PASS                |          |
| A06: Flat 008 - Living/Kitchen | A06   | Living/Kitchen | 2.00            | 3.05                        | PASS                |          |
| A06: Flat 009 - Bedroom 1      | A06   | Bedroom        | 1.00            | 2.56                        | PASS                |          |
| A06: Flat 009 - Bedroom 2      | A06   | Bedroom        | 1.00            | 3.36                        | PASS                |          |
| A06: Flat 009 - Living/Kitchen | A06   | Living/Kitchen | 2.00            | 6.16                        | PASS                |          |
| A07: Flat 001 - Bedroom 1      | A07   | Bedroom        | 1.00            | 2.72                        | PASS                |          |
| A07: Flat 001 - Bedroom 2      | A07   | Bedroom        | 1.00            | 3.59                        | PASS                |          |
| A07: Flat 001 - Living/Kitchen | A07   | Living/Kitchen | 2.00            | 6.24                        | PASS                |          |
| A07: Flat 002 - Bedroom 1      | A07   | Bedroom        | 1.00            | 3.55                        | PASS                |          |
| A07: Flat 002 - Bedroom 2      | A07   | Bedroom        | 1.00            | 3.79                        | PASS                |          |
| A07: Flat 002 - Living/Kitchen | A07   | Living/Kitchen | 2.00            | 3.02                        | PASS                |          |
| A07: Flat 003 - Bedroom 1      | A07   | Bedroom        | 1.00            | 3.52                        | PASS                |          |
| A07: Flat 003 - Bedroom 2      | A07   | Bedroom        | 1.00            | 3.8                         | PASS                |          |
| A07: Flat 003 - Living/Kitchen | A07   | Living/Kitchen | 2.00            | 3.04                        | PASS                |          |
| A07: Flat 004 - Bedroom 1      | A07   | Bedroom        | 1.00            | 2.52                        | PASS                |          |
| A07: Flat 004 - Bedroom 2      | A07   | Bedroom        | 1.00            | 3.55                        | PASS                |          |
| A07: Flat 004 - Living/Kitchen | A07   | Living/Kitchen | 2.00            | 4.92                        | PASS                |          |
| A07: Flat 005 - Bedroom 1      | A07   | Bedroom        | 1.00            | 2.47                        | PASS                |          |
| A07: Flat 005 - Bedroom 2      | A07   | Bedroom        | 1.00            | 3.25                        | PASS                |          |
| A07: Flat 005 - Living/Kitchen | A07   | Living/Kitchen | 2.00            | 4.72                        | PASS                |          |
| A07: Flat 006 - Bedroom 1      | A07   | Bedroom        | 1.00            | 3.41                        | PASS                |          |
| A07: Flat 006 - Bedroom 2      | A07   | Bedroom        | 1.00            | 3.73                        | PASS                |          |
| A07: Flat 006 - Living/Kitchen | A07   | Living/Kitchen | 2.00            | 2.78                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| A07: Flat 007 - Bedroom 1      | A07   | Bedroom        | 1.00            | 3.68                        | PASS                |          |
| A07: Flat 007 - Living/Kitchen | A07   | Living/Kitchen | 2.00            | 3.04                        | PASS                |          |
| A07: Flat 008 - Bedroom 1      | A07   | Bedroom        | 1.00            | 3.21                        | PASS                |          |
| A07: Flat 008 - Living/Kitchen | A07   | Living/Kitchen | 2.00            | 3.07                        | PASS                |          |
| A07: Flat 009 - Bedroom 1      | A07   | Bedroom        | 1.00            | 2.54                        | PASS                |          |
| A07: Flat 009 - Bedroom 2      | A07   | Bedroom        | 1.00            | 3.37                        | PASS                |          |
| A07: Flat 009 - Living/Kitchen | A07   | Living/Kitchen | 2.00            | 6.17                        | PASS                |          |

### **7.1.2 BLOCK B**

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments                               |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------------------------------------|
| B00: Flat 001 – Bedroom 1      | B00   | Bedroom        | 1.00            | 2.42                        | PASS                |                                        |
| B00: Flat 001 - Living/Kitchen | B00   | Living/Kitchen | 2.00            | 2.36                        | PASS                |                                        |
| B00: Flat 002 - Bedroom 1      | B00   | Bedroom        | 1.00            | 2.09                        | PASS                |                                        |
| B00: Flat 002 - Bedroom 2      | B00   | Bedroom        | 1.00            | 2.29                        | PASS                |                                        |
| B00: Flat 002 - Living/Kitchen | B00   | Living/Kitchen | 2.00            | 2.02                        | PASS                | Higher Transmittance glazing used: 75% |
| B00: Flat 003 - Bedroom        | B00   | Bedroom        | 1.00            | 1.81                        | PASS                |                                        |
| B00: Flat 003 - Living/Kitchen | B00   | Living/Kitchen | 2.00            | 2.12                        | PASS                | Higher Transmittance glazing used: 75% |
| B00: Flat 004 - Bedroom 1      | B00   | Bedroom        | 1.00            | 2.17                        | PASS                |                                        |
| B00: Flat 004 - Bedroom 2      | B00   | Bedroom        | 1.00            | 2.41                        | PASS                |                                        |
| B00: Flat 004 - Living/Kitchen | B00   | Living/Kitchen | 2.00            | 3.17                        | PASS                |                                        |
| B00: Flat 005 - Bedroom 1      | B00   | Bedroom        | 1.00            | 3.54                        | PASS                |                                        |
| B00: Flat 005 - Bedroom 2      | B00   | Bedroom        | 1.00            | 3.74                        | PASS                |                                        |
| B00: Flat 005 - Living/Kitchen | B00   | Living/Kitchen | 2.00            | 3.93                        | PASS                |                                        |
| B00: Flat 006 - Bedroom 1      | B00   | Bedroom        | 1.00            | 3.34                        | PASS                |                                        |
| B00: Flat 006 - Bedroom 2      | B00   | Bedroom        | 1.00            | 3.43                        | PASS                |                                        |
| B00: Flat 006 - Living/Kitchen | B00   | Living/Kitchen | 2.00            | 2.85                        | PASS                |                                        |
| B00: Flat 007- Bedroom 1       | B00   | Bedroom        | 1.00            | 3.20                        | PASS                |                                        |
| B00: Flat 007 - Bedroom 2      | B00   | Bedroom        | 1.00            | 3.31                        | PASS                |                                        |
| B00: Flat 007 - Living/Kitchen | B00   | Living/Kitchen | 2.00            | 2.81                        | PASS                |                                        |
| B01: Flat 001 - Bedroom        | B01   | Bedroom        | 1.00            | 2.41                        | PASS                |                                        |
| B01: Flat 001 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 3.3                         | PASS                |                                        |
| B01: Flat 002 - Bedroom 1      | B01   | Bedroom        | 1.00            | 2.05                        | PASS                |                                        |
| B01: Flat 002 - Bedroom 2      | B01   | Bedroom        | 1.00            | 2.24                        | PASS                |                                        |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| B01: Flat 002 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 2.59                        | PASS                |          |
| B01: Flat 003 - Bedroom 1      | B01   | Bedroom        | 1.00            | 1.98                        | PASS                |          |
| B01: Flat 003 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 2.71                        | PASS                |          |
| B01: Flat 004 - Bedroom 1      | B01   | Bedroom        | 1.00            | 2.25                        | PASS                |          |
| B01: Flat 004 - Bedroom 2      | B01   | Bedroom        | 1.00            | 2.85                        | PASS                |          |
| B01: Flat 004 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 3.2                         | PASS                |          |
| B01: Flat 005 - Bedroom 1      | B01   | Bedroom        | 1.00            | 3.66                        | PASS                |          |
| B01: Flat 005 - Bedroom 2      | B01   | Bedroom        | 1.00            | 2.83                        | PASS                |          |
| B01: Flat 005 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 4.59                        | PASS                |          |
| B01: Flat 006 - Bedroom 1      | B01   | Bedroom        | 1.00            | 3.64                        | PASS                |          |
| B01: Flat 006 - Bedroom 2      | B01   | Bedroom        | 1.00            | 3.64                        | PASS                |          |
| B01: Flat 006 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 2.7                         | PASS                |          |
| B01: Flat 007 - Bedroom 1      | B01   | Bedroom        | 1.00            | 3.53                        | PASS                |          |
| B01: Flat 007 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 2.66                        | PASS                |          |
| B01: Flat 008 - Bedroom        | B01   | Bedroom        | 1.00            | 2.9                         | PASS                |          |
| B01: Flat 008 - Bedroom 2      | B01   | Bedroom        | 1.00            | 3.56                        | PASS                |          |
| B01: Flat 008 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 2.71                        | PASS                |          |
| B01: Flat 009 - Bedroom        | B01   | Bedroom        | 1.00            | 3.62                        | PASS                |          |
| B01: Flat 009 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 3.03                        | PASS                |          |
| B01: Flat 010 - Bedroom 1      | B01   | Bedroom        | 1.00            | 3.54                        | PASS                |          |
| B01: Flat 010 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 4.67                        | PASS                |          |
| B01: Flat 011 - Bedroom 1      | B01   | Bedroom        | 1.00            | 2.65                        | PASS                |          |
| B01: Flat 011 - Living/Kitchen | B01   | Living/Kitchen | 2.00            | 3.86                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| B02: Flat 001 - Bedroom 1      | B02   | Bedroom        | 1.00            | 2.44                        | PASS                |          |
| B02: Flat 001 - Bedroom 2      | B02   | Bedroom        | 1.00            | 2.3                         | PASS                |          |
| B02: Flat 001 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 5.61                        | PASS                |          |
| B02: Flat 002 - Bedroom 1      | B02   | Bedroom        | 1.00            | 3.63                        | PASS                |          |
| B02: Flat 002 - Bedroom 2      | B02   | Bedroom        | 1.00            | 2.47                        | PASS                |          |
| B02: Flat 002 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 2.9                         | PASS                |          |
| B02: Flat 003 - Bedroom 1      | B02   | Bedroom        | 1.00            | 2.2                         | PASS                |          |
| B02: Flat 003 - Bedroom 2      | B02   | Bedroom        | 1.00            | 2.41                        | PASS                |          |
| B02: Flat 003 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 2.76                        | PASS                |          |
| B02: Flat 004 - Bedroom 1      | B02   | Bedroom        | 1.00            | 2.12                        | PASS                |          |
| B02: Flat 004 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 2.89                        | PASS                |          |
| B02: Flat 005 - Bedroom 1      | B02   | Bedroom        | 1.00            | 2.4                         | PASS                |          |
| B02: Flat 005 - Bedroom 2      | B02   | Bedroom        | 1.00            | 2.85                        | PASS                |          |
| B02: Flat 005 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 3.32                        | PASS                |          |
| B02: Flat 006 - Bedroom 1      | B02   | Bedroom        | 1.00            | 3.69                        | PASS                |          |
| B02: Flat 006 - Bedroom 2      | B02   | Bedroom        | 1.00            | 2.85                        | PASS                |          |
| B02: Flat 006 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 4.62                        | PASS                |          |
| B02: Flat 007 - Bedroom 1      | B02   | Bedroom        | 1.00            | 3.68                        | PASS                |          |
| B02: Flat 007 - Bedroom 2      | B02   | Bedroom        | 1.00            | 3.7                         | PASS                |          |
| B02: Flat 007 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 2.74                        | PASS                |          |
| B02: Flat 008 - Bedroom 1      | B02   | Bedroom        | 1.00            | 3.59                        | PASS                |          |
| B02: Flat 008 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 2.73                        | PASS                |          |
| B02: Flat 009 - Bedroom 1      | B02   | Bedroom        | 1.00            | 3.11                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| B02: Flat 009 - Bedroom 2      | B02   | Bedroom        | 1.00            | 3.66                        | PASS                |          |
| B02: Flat 009 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 2.85                        | PASS                |          |
| B02: Flat 010 - Bedroom        | B02   | Bedroom        | 1.00            | 3.63                        | PASS                |          |
| B02: Flat 010 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 3.02                        | PASS                |          |
| B02: Flat 011 - Bedroom 1      | B02   | Bedroom        | 1.00            | 3.55                        | PASS                |          |
| B02: Flat 011 - Bedroom 2      | B02   | Bedroom        | 1.00            | 2.96                        | PASS                |          |
| B02: Flat 011 - Living/Kitchen | B02   | Living/        | 2.00            | 4.67                        | PASS                |          |
| B02: Flat 012 - Bedroom 1      | B02   | Bedroom        | 1.00            | 2.73                        | PASS                |          |
| B02: Flat 012 - Bedroom 2      | B02   | Bedroom        | 1.00            | 2.84                        | PASS                |          |
| B02: Flat 012 - Living/Kitchen | B02   | Living/Kitchen | 2.00            | 4.01                        | PASS                |          |
| B03: Flat 001 - Bedroom 1      | B03   | Bedroom        | 1.00            | 2.97                        | PASS                |          |
| B03: Flat 001 - Bedroom 2      | B03   | Bedroom        | 1.00            | 2.24                        | PASS                |          |
| B03: Flat 001 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 4.70                        | PASS                |          |
| B03: Flat 002 - Bedroom 1      | B03   | Bedroom        | 1.00            | 3.64                        | PASS                |          |
| B03: Flat 002 - Bedroom 2      | B03   | Bedroom        | 1.00            | 2.65                        | PASS                |          |
| B03: Flat 002 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 3.24                        | PASS                |          |
| B03: Flat 003 - Bedroom 1      | B03   | Bedroom        | 1.00            | 2.39                        | PASS                |          |
| B03: Flat 003 - Bedroom 2      | B03   | Bedroom        | 1.00            | 2.61                        | PASS                |          |
| B03: Flat 003 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 2.97                        | PASS                |          |
| B03: Flat 004 - Bedroom 1      | B03   | Bedroom        | 1.00            | 2.32                        | PASS                |          |
| B03: Flat 004 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 3.14                        | PASS                |          |
| B03: Flat 005 - Bedroom 1      | B03   | Bedroom        | 1.00            | 2.60                        | PASS                |          |
| B03: Flat 005 - Bedroom 2      | B03   | Bedroom        | 1.00            | 2.85                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| B03: Flat 005 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 3.50                        | PASS                |          |
| B03: Flat 006 - Bedroom 1      | B03   | Bedroom        | 1.00            | 3.70                        | PASS                |          |
| B03: Flat 006 - Bedroom 2      | B03   | Bedroom        | 1.00            | 2.84                        | PASS                |          |
| B03: Flat 006 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 4.64                        | PASS                |          |
| B03: Flat 007 - Bedroom 1      | B03   | Bedroom        | 1.00            | 3.70                        | PASS                |          |
| B03: Flat 007 - Bedroom 2      | B03   | Bedroom        | 1.00            | 3.71                        | PASS                |          |
| B03: Flat 007 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 2.76                        | PASS                |          |
| B03: Flat 008 - Bedroom 1      | B03   | Bedroom        | 1.00            | 3.60                        | PASS                |          |
| B03: Flat 008 - Bedroom 2      | B03   | Bedroom        | 1.00            | 3.71                        | PASS                |          |
| B03: Flat 008 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 2.76                        | PASS                |          |
| B03: Flat 009 - Bedroom        | B03   | Bedroom        | 1.00            | 3.36                        | PASS                |          |
| B03: Flat 010 - Bedroom        | B03   | Bedroom        | 1.00            | 3.63                        | PASS                |          |
| B03: Flat 009 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 2.92                        | PASS                |          |
| B03: Flat 010 - Living/Kitchen | B03   | Living/Kitchen | 2.00            | 3.16                        | PASS                |          |
| B04: Flat 001 - Bedroom 1      | B04   | Bedroom        | 1.00            | 3.07                        | PASS                |          |
| B04: Flat 001 - Bedroom 2      | B04   | Bedroom        | 1.00            | 2.32                        | PASS                |          |
| B04: Flat 001 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 4.71                        | PASS                |          |
| B04: Flat 002 - Bedroom 1      | B04   | Bedroom        | 1.00            | 3.93                        | PASS                |          |
| B04: Flat 002 - Bedroom 2      | B04   | Bedroom        | 1.00            | 2.89                        | PASS                |          |
| B04: Flat 002 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 3.45                        | PASS                |          |
| B04: Flat 003 - Bedroom 1      | B04   | Bedroom        | 1.00            | 2.65                        | PASS                |          |
| B04: Flat 003 - Bedroom 2      | B04   | Bedroom        | 1.00            | 2.85                        | PASS                |          |
| B04: Flat 003 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 3.25                        | PASS                |          |

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| B04: Flat 004 - Bedroom 1      | B04   | Bedroom        | 1.00            | 2.57                        | PASS                |          |
| B04: Flat 004 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 3.46                        | PASS                |          |
| B04: Flat 005 - Bedroom 1      | B04   | Bedroom        | 1.00            | 2.85                        | PASS                |          |
| B04: Flat 005 - Bedroom 2      | B04   | Bedroom        | 1.00            | 2.85                        | PASS                |          |
| B04: Flat 005 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 3.73                        | PASS                |          |
| B04: Flat 006 - Bedroom 1      | B04   | Bedroom        | 1.00            | 3.72                        | PASS                |          |
| B04: Flat 006 - Bedroom 2      | B04   | Bedroom        | 1.00            | 2.84                        | PASS                |          |
| B04: Flat 006 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 4.65                        | PASS                |          |
| B04: Flat 007 - Bedroom 1      | B04   | Bedroom        | 1.00            | 3.70                        | PASS                |          |
| B04: Flat 007 - Bedroom 2      | B04   | Bedroom        | 1.00            | 3.71                        | PASS                |          |
| B04: Flat 007 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 2.76                        | PASS                |          |
| B04: Flat 008 - Bedroom 1      | B04   | Bedroom        | 1.00            | 3.61                        | PASS                |          |
| B04: Flat 008 - Bedroom 2      | B04   | Bedroom        | 1.00            | 3.70                        | PASS                |          |
| B04: Flat 008 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 2.76                        | PASS                |          |
| B04: Flat 009 - Bedroom        | B04   | Bedroom        | 1.00            | 3.39                        | PASS                |          |
| B04: Flat 009 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 2.93                        | PASS                |          |
| B04: Flat 010 - Bedroom        | B04   | Bedroom        | 1.00            | 3.60                        | PASS                |          |
| B04: Flat 010 - Living/Kitchen | B04   | Living/Kitchen | 2.00            | 3.15                        | PASS                |          |

### **7.1.3    *Townhouses***

| ROOM NAME                      | FLOOR | TYPE           | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|--------------------------------|-------|----------------|-----------------|-----------------------------|---------------------|----------|
| T00: Flat T01 - Living         | T00   | Living         | 1.50            | 4.11                        | PASS                |          |
| T00: Flat T01 - Dining/Kitchen | T00   | Dining/Kitchen | 2.00            | 6.78                        | PASS                |          |
| T00: Flat T02 - Living/Kitchen | T00   | Living/Kitchen | 2.00            | 4.01                        | PASS                |          |
| T00: Flat T03 - Living/Kitchen | T00   | Living/Kitchen | 2.00            | 4.02                        | PASS                |          |
| T00: Flat T04 - Living/Kitchen | T00   | Living/Kitchen | 2.00            | 4.10                        | PASS                |          |
| T00: Flat T05 - Living/Kitchen | T00   | Living/Kitchen | 2.00            | 4.21                        | PASS                |          |
| T00: Flat T06 - Living/Kitchen | T00   | Living/Kitchen | 2.00            | 4.22                        | PASS                |          |
| T00: Flat T07 - Living/Kitchen | T00   | Living/Kitchen | 2.00            | 4.04                        | PASS                |          |
| T00: Flat T08 - Living/Kitchen | T00   | Living/Kitchen | 2.00            | 4.30                        | PASS                |          |
| T00: Flat T09 - Living/Kitchen | T00   | Living/Kitchen | 2.00            | 4.24                        | PASS                |          |
| T00: Flat T10 - Living         | T00   | Living         | 1.50            | 4.13                        | PASS                |          |
| T00: Flat T10 - Dining/Kitchen | T00   | Dining/Kitchen | 2.00            | 7.80                        | PASS                |          |
| T01: Flat T01 - Bedroom 1      | T01   | Bedroom        | 1.00            | 3.95                        | PASS                |          |
| T01: Flat T01 - Bedroom 2      | T01   | Bedroom        | 1.00            | 4.25                        | PASS                |          |
| T01: Flat T02 - Bedroom 1      | T01   | Bedroom        | 1.00            | 3.32                        | PASS                |          |
| T01: Flat T02 - Bedroom 2      | T01   | Bedroom        | 1.00            | 5.11                        | PASS                |          |
| T01: Flat T03 - Bedroom 1      | T01   | Bedroom        | 1.00            | 3.24                        | PASS                |          |
| T01: Flat T03 - Bedroom 2      | T01   | Bedroom        | 1.00            | 5.14                        | PASS                |          |
| T01: Flat T04 - Bedroom 1      | T01   | Bedroom        | 1.00            | 3.26                        | PASS                |          |
| T01: Flat T04 - Bedroom 2      | T01   | Bedroom        | 1.00            | 5.12                        | PASS                |          |
| T01: Flat T05 - Bedroom 1      | T01   | Bedroom        | 1.00            | 3.36                        | PASS                |          |
| T01: Flat T05 - Bedroom 2      | T01   | Bedroom        | 1.00            | 5.29                        | PASS                |          |
| T01: Flat T06 - Bedroom 1      | T01   | Bedroom        | 1.00            | 3.43                        | PASS                |          |
| T01: Flat T06 - Bedroom 2      | T01   | Bedroom        | 1.00            | 5.29                        | PASS                |          |

| ROOM NAME                 | FLOOR | TYPE    | AECB target (%) | Average daylight factor (%) | AECB TARGET REACHED | Comments |
|---------------------------|-------|---------|-----------------|-----------------------------|---------------------|----------|
| T01: Flat T07 - Bedroom 1 | T01   | Bedroom | 1.00            | 3.31                        | PASS                |          |
| T01: Flat T07 - Bedroom 2 | T01   | Bedroom | 1.00            | 5.14                        | PASS                |          |
| T01: Flat T08 - Bedroom 1 | T01   | Bedroom | 1.00            | 3.39                        | PASS                |          |
| T01: Flat T08 - Bedroom 2 | T01   | Bedroom | 1.00            | 5.12                        | PASS                |          |
| T01: Flat T09 - Bedroom 1 | T01   | Bedroom | 1.00            | 3.44                        | PASS                |          |
| T01: Flat T09 - Bedroom 2 | T01   | Bedroom | 1.00            | 5.14                        | PASS                |          |
| T01: Flat T10 - Bedroom 1 | T01   | Bedroom | 1.00            | 4.05                        | PASS                |          |
| T01: Flat T10 - Bedroom 2 | T01   | Bedroom | 1.00            | 4.27                        | PASS                |          |
| T02: Flat T01 - Bedroom   | T02   | Bedroom | 1.00            | 2.73                        | PASS                |          |
| T02: Flat T01 - Bedroom 2 | T02   | Bedroom | 1.00            | 4.25                        | PASS                |          |
| T02: Flat T02 - Bedroom   | T02   | Bedroom | 1.00            | 2.53                        | PASS                |          |
| T02: Flat T03 - Bedroom   | T02   | Bedroom | 1.00            | 2.57                        | PASS                |          |
| T02: Flat T04 - Bedroom   | T02   | Bedroom | 1.00            | 2.56                        | PASS                |          |
| T02: Flat T05 - Bedroom   | T02   | Bedroom | 1.00            | 2.68                        | PASS                |          |
| T02: Flat T06 - Bedroom   | T02   | Bedroom | 1.00            | 2.65                        | PASS                |          |
| T02: Flat T07 - Bedroom   | T02   | Bedroom | 1.00            | 2.56                        | PASS                |          |
| T02: Flat T08 - Bedroom   | T02   | Bedroom | 1.00            | 2.56                        | PASS                |          |
| T02: Flat T09 - Bedroom   | T02   | Bedroom | 1.00            | 2.54                        | PASS                |          |
| T02: Flat T10 - Bedroom   | T02   | Bedroom | 1.00            | 2.75                        | PASS                |          |
| T02: Flat T10 - Bedroom 2 | T02   | Bedroom | 1.00            | 4.26                        | PASS                |          |

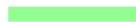
## **7.2 Appendix B – IES VE Daylighting Visualisation**

### **7.2.1 BLOCK A**



Figure 7.2.1.1 Block A Ground Floor – Daylight Visualization

**Key ( Average Daylight Factor)**

|                 |                                                                                       |
|-----------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F |  |
| 2.00 - 4.00 D.F |  |
| 4.00 - 8.00 D.F |  |
| 8.00 +          |  |

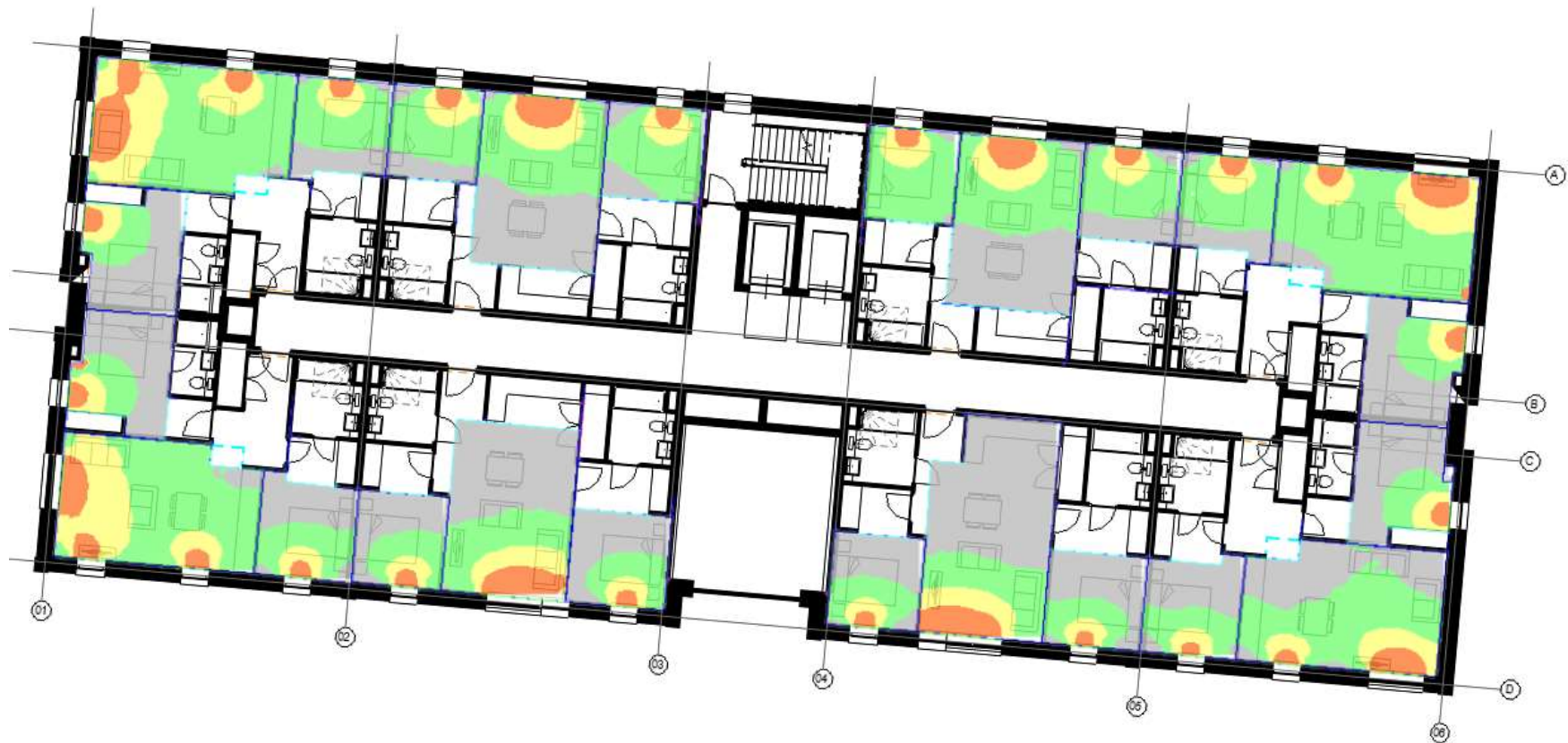


Figure 7.2.1.2 Block A First Floor – Daylight Visualization

**Key ( Average Daylight Factor)**

|                 |                                                                                       |
|-----------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F |  |
| 2.00 - 4.00 D.F |  |
| 4.00 - 8.00 D.F |  |
| 8.00 +          |  |

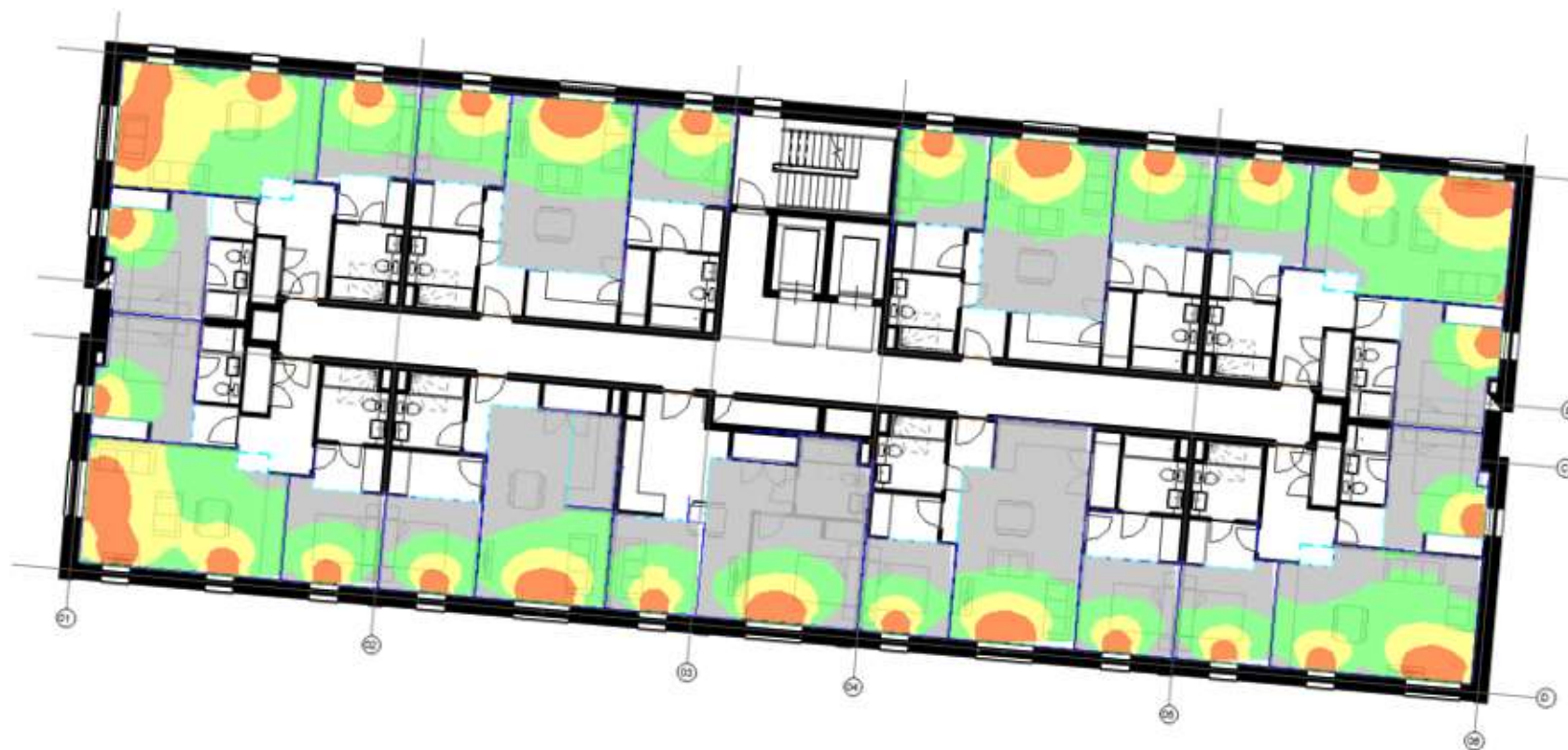


Figure 7.2.1.1 Block A Second Floor – Daylight Visualization

*Note: The visualisation is as per modifications mentioned in Appendix C*

**Key ( Average Daylight Factor)**

|                 |                                                                                       |
|-----------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F |  |
| 2.00 - 4.00 D.F |  |
| 4.00 - 8.00 D.F |  |
| 8.00 +          |  |

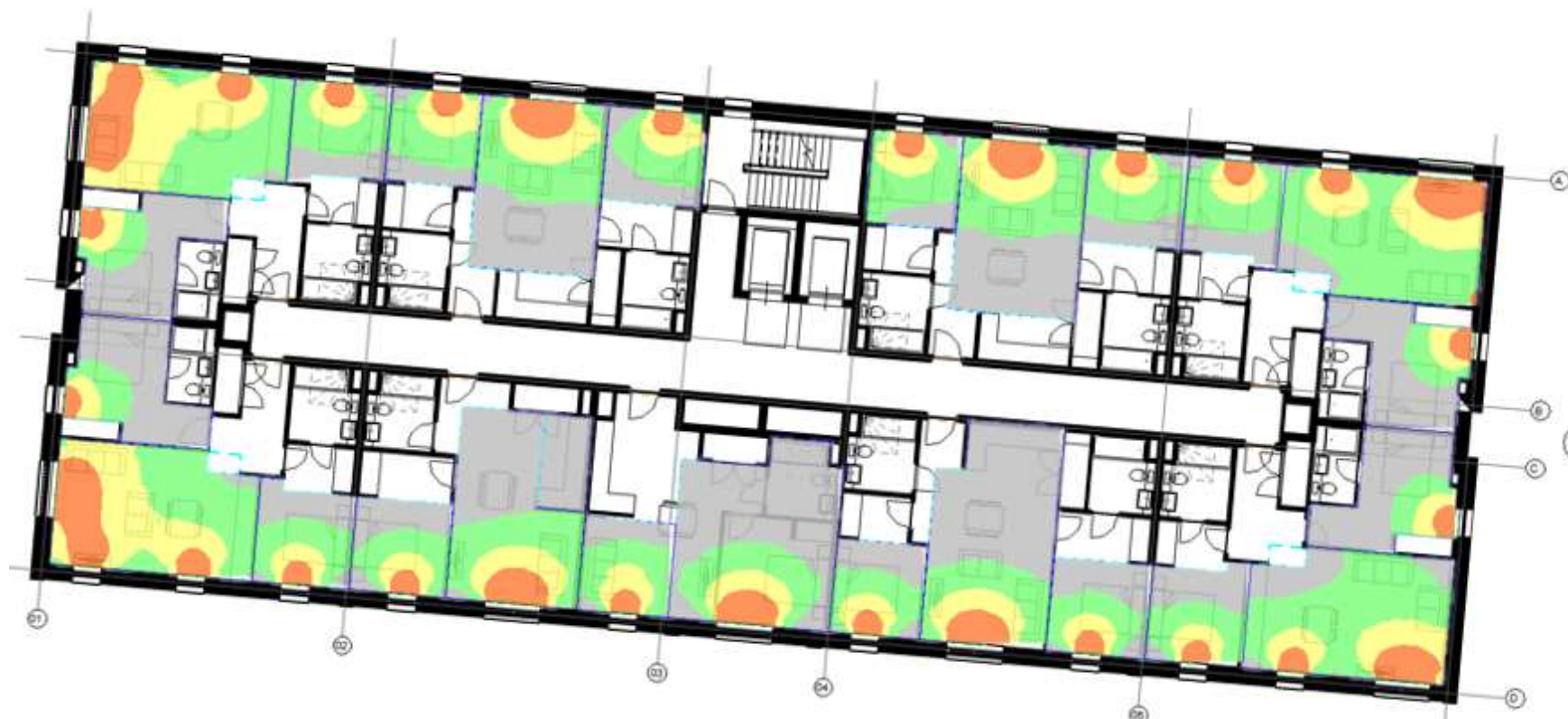
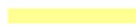


Figure 7.2.1.2 Block A Third Floor – Daylight Visualization

*Note: The visualisation is as per modifications mentioned in Appendix C*

| Key ( Average Daylight Factor) |                                                                                       |
|--------------------------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F                |  |
| 2.00 - 4.00 D.F                |  |
| 4.00 - 8.00 D.F                |  |
| 8.00 +                         |  |

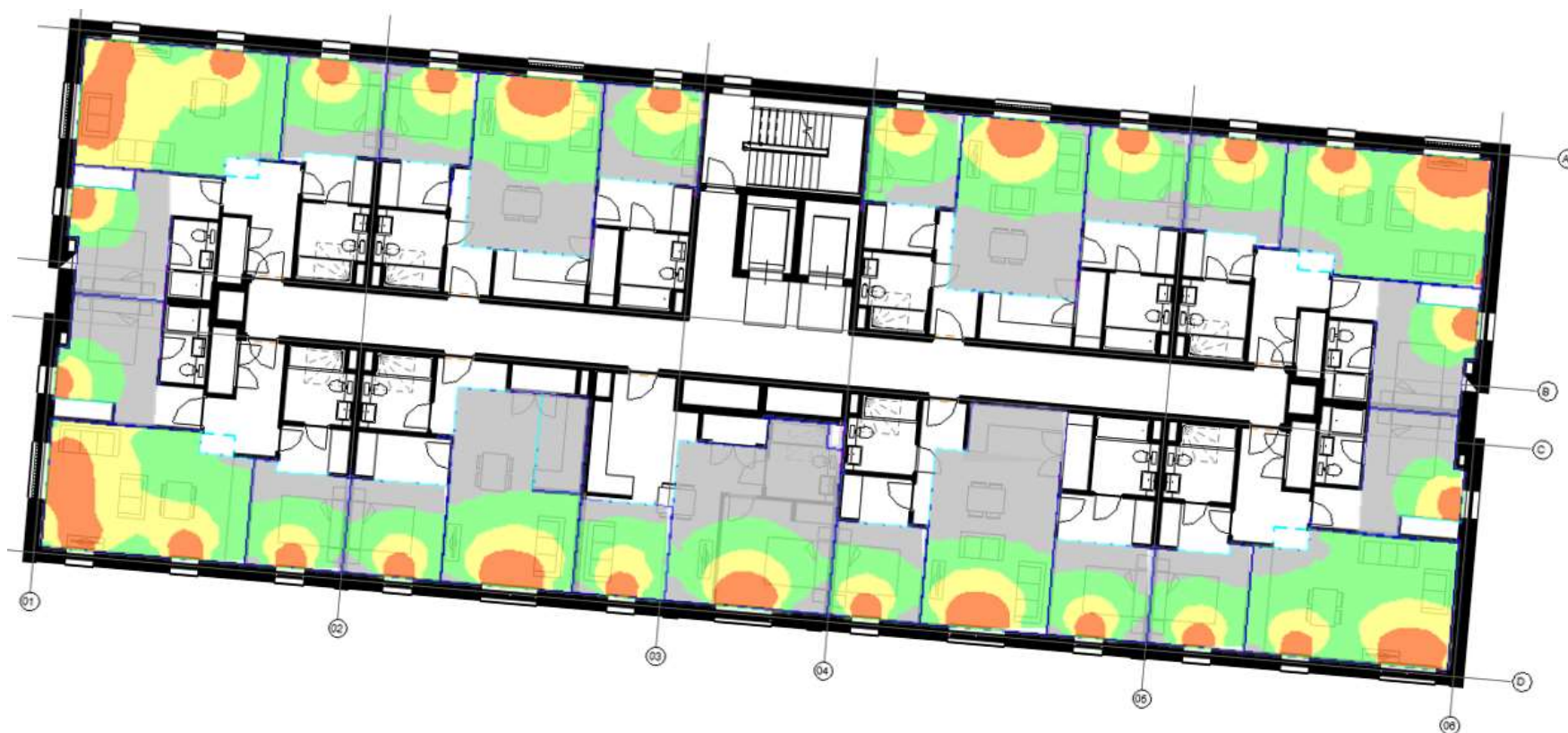
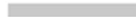


Figure 7.2.1.3 Block A Fourth Floor – Daylight Visualization

*Note: The visualisation is as per modifications mentioned in Appendix C*

| Key ( Average Daylight Factor) |                                                                                       |
|--------------------------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F                |  |
| 2.00 - 4.00 D.F                |  |
| 4.00 - 8.00 D.F                |  |
| 8.00 +                         |  |

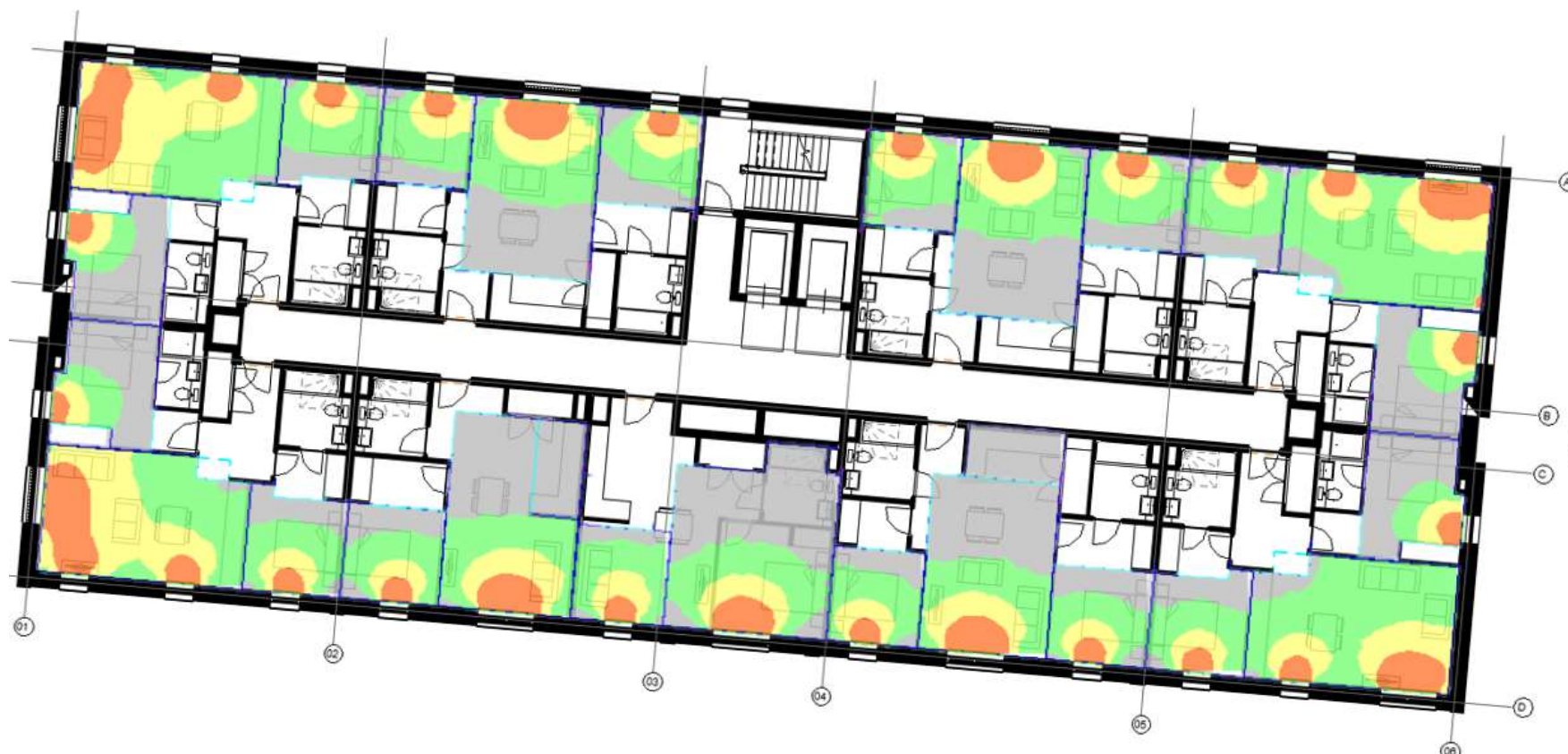
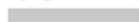
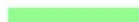


Figure 7.2.1.4 Block A Fifth Floor – Daylight Visualization

*Note: The visualisation is as per modifications mentioned in Appendix C*

**Key ( Average Daylight Factor)**

|                 |                                                                                       |
|-----------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F |  |
| 2.00 - 4.00 D.F |  |
| 4.00 - 8.00 D.F |  |
| 8.00 +          |  |

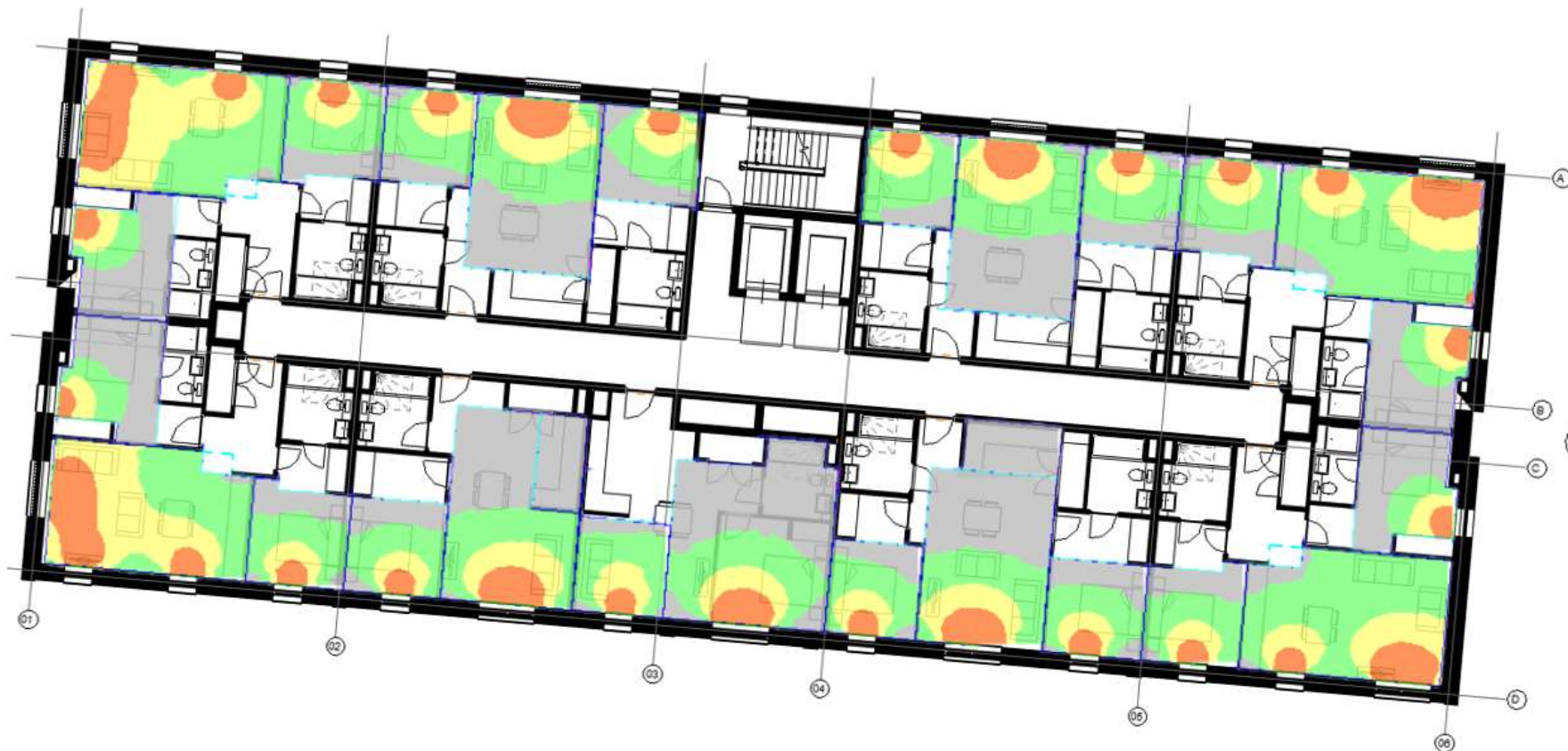


Figure 7.2.1.5 Block A Sixth Floor – Daylight Visualization

*Note: The visualisation is as per modifications mentioned in Appendix C*

**Key ( Average Daylight Factor)**

|                 |                                                                                       |
|-----------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F |  |
| 2.00 - 4.00 D.F |  |
| 4.00 - 8.00 D.F |  |
| 8.00 +          |  |

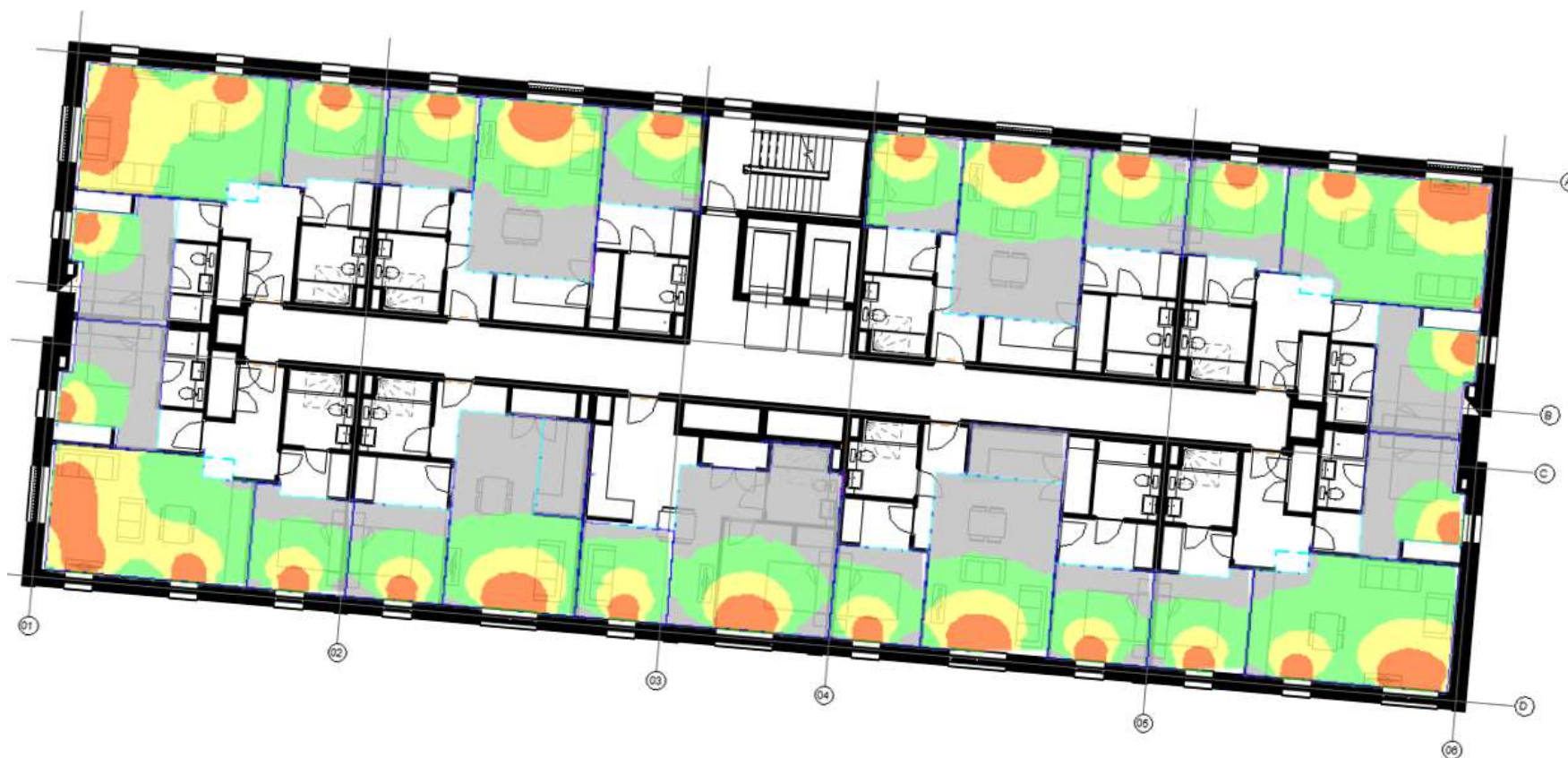
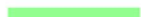


Figure 7.2.1.6 Block A Seventh Floor – Daylight Visualization

Note: The visualisation is as per modifications mentioned in Appendix C

**Key ( Average Daylight Factor)**

|                 |                                                                                       |
|-----------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F |  |
| 2.00 - 4.00 D.F |  |
| 4.00 - 8.00 D.F |  |
| 8.00 +          |  |

### 7.2.2 BLOCK B

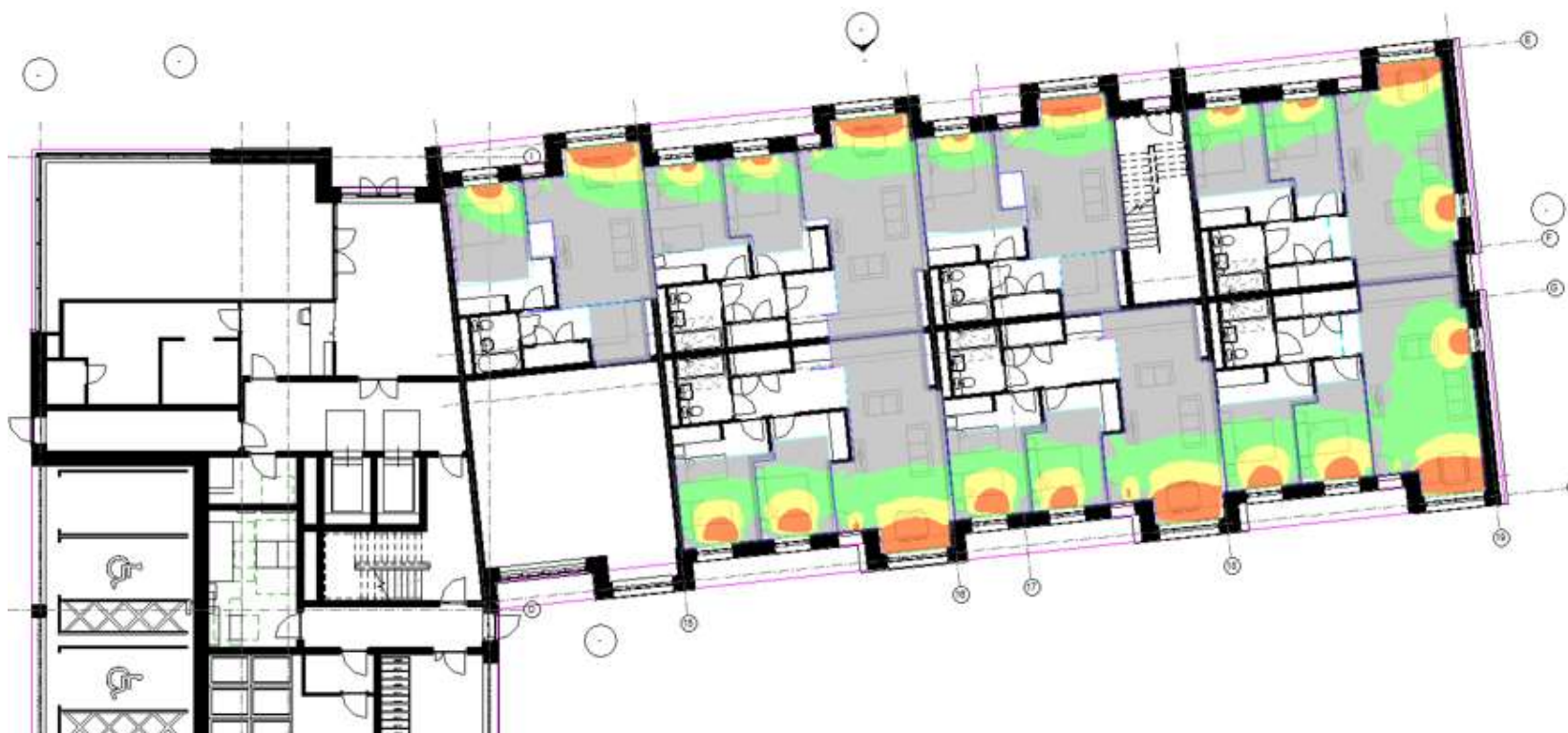


Figure 7.2.2.1 Block B Ground Floor – Daylight Visualization

*Note: The visualisation is as per modifications mentioned in Appendix C*

| Key ( Average Daylight Factor) |                                                                                       |
|--------------------------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F                |  |
| 2.00 - 4.00 D.F                |  |
| 4.00 - 8.00 D.F                |  |
| 8.00 +                         |  |

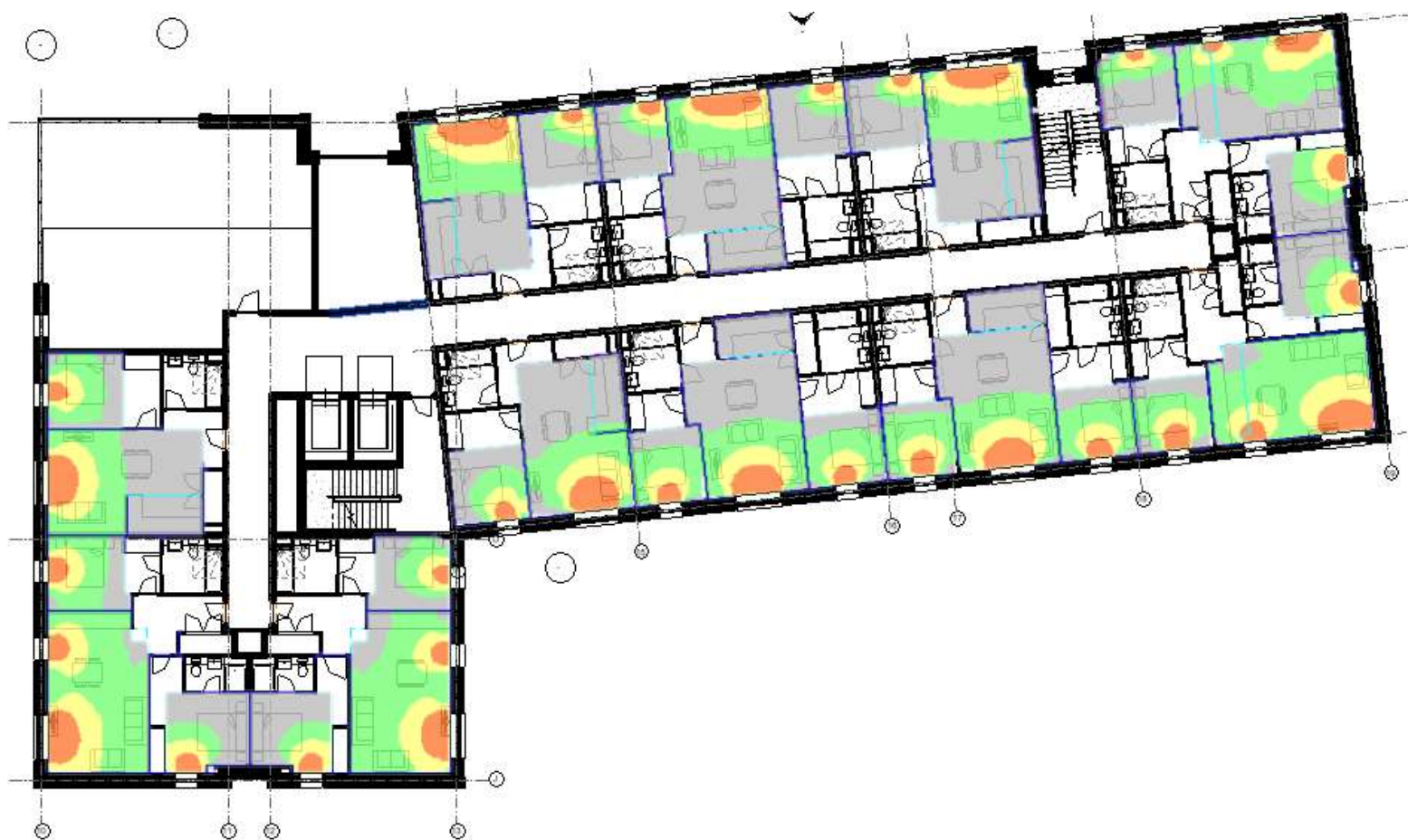
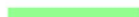


Figure 7.2.2.2 Block B First Floor – Daylight Visualization

**Key ( Average Daylight Factor)**  
 0.00 - 2.00 D.F.   
 2.00 - 4.00 D.F.   
 4.00 - 8.00 D.F.   
 8.00+ 

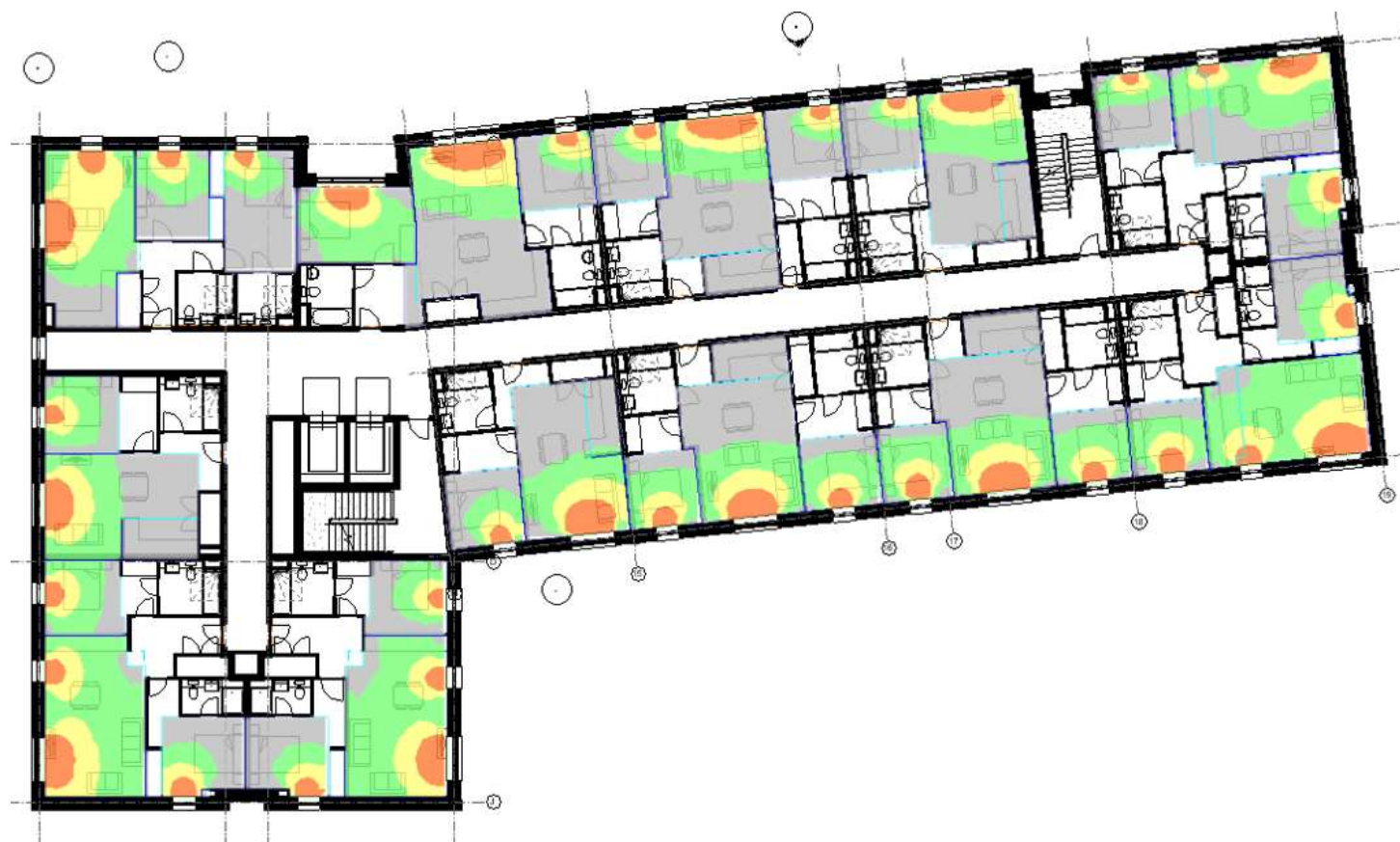
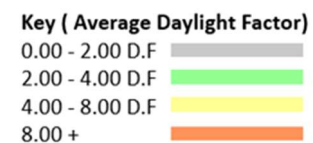


Figure 7.2.2.3 Block B Second Floor - Daylight Visualization

*Note: The visualisation is as per modifications mentioned in Appendix C*



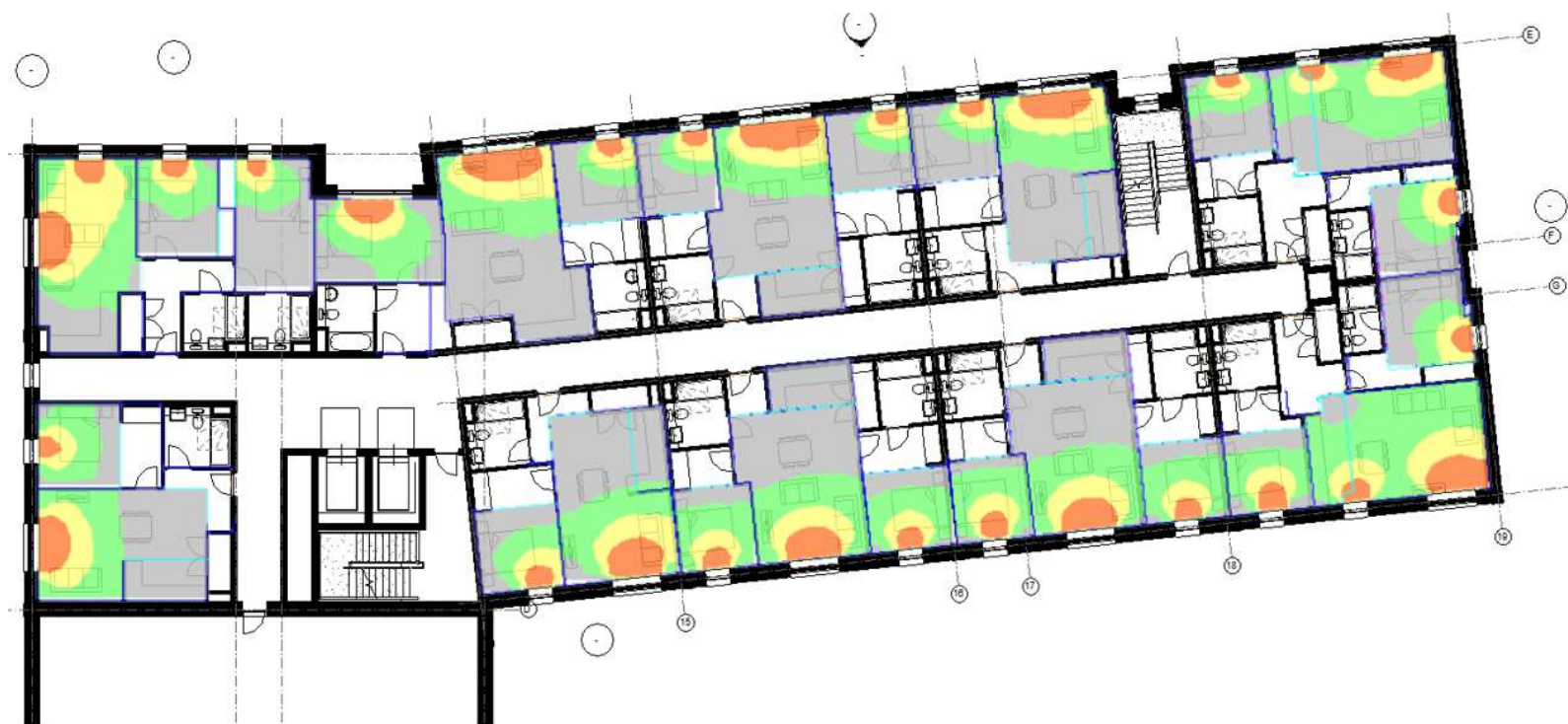


Figure 7.2.2.4 Block B Third Floor - Daylight Visualization

*Note: The visualisation is as per modifications mentioned in Appendix C*

| Key ( Average Daylight Factor) |                                                                                       |
|--------------------------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F                |  |
| 2.00 - 4.00 D.F                |  |
| 4.00 - 8.00 D.F                |  |
| 8.00 +                         |  |

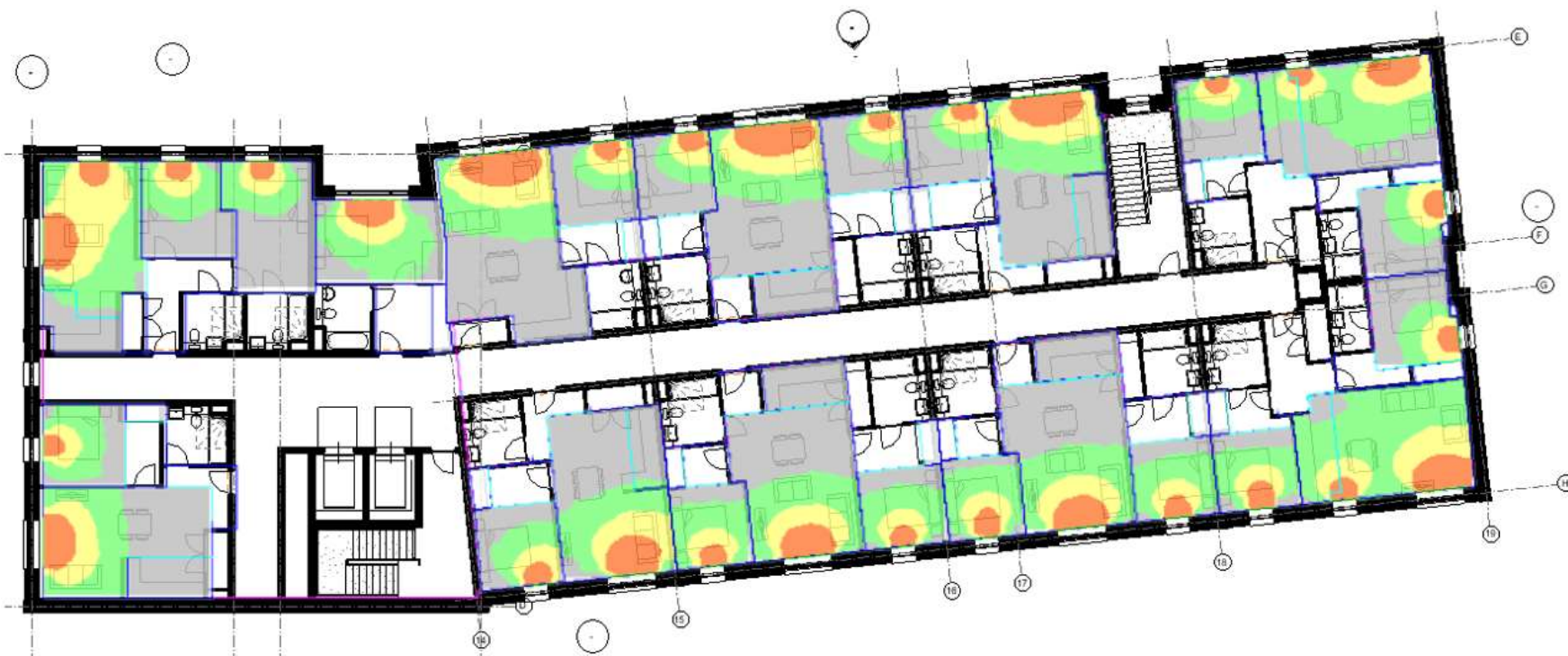


Figure 7.2.2.5 Block B Fourth Floor - Daylight Visualization

*Note: The visualisation is as per modifications mentioned in Appendix C*

**Key ( Average Daylight Factor)**  
 0.00 - 2.00 D.F.   
 2.00 - 4.00 D.F.   
 4.00 - 8.00 D.F.   
 8.00+ 

### 7.2.3 Townhouses



Figure 7.2.3.1 Townhouses Ground Floor - Daylight Visualization



Figure 7.2.3.2 Townhouses First Floor - Daylight Visualization

**Key ( Average Daylight Factor)**

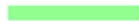
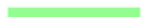
|                 |                                                                                       |
|-----------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F |  |
| 2.00 - 4.00 D.F |  |
| 4.00 - 8.00 D.F |  |
| 8.00 +          |  |



Figure 7.2.3.3 Townhouses Second Floor - Daylight Visualization

**Key ( Average Daylight Factor)**

|                 |                                                                                       |
|-----------------|---------------------------------------------------------------------------------------|
| 0.00 - 2.00 D.F |  |
| 2.00 - 4.00 D.F |  |
| 4.00 - 8.00 D.F |  |
| 8.00 +          |  |

## 7.3 Appendix C – Additional design modifications

### 7.3.1 BLOCKS A & B

- I. Extend vision panels to 300mm x 1800mm

Note: This change has been modelled for rooms:

1. A00: Flat 005 - Living/Kitchen
2. A00: Flat 006 - Living/Kitchen
3. A00: Flat 007 - Living/Kitchen
4. B00: Flat 002 - Living/Kitchen
5. B00: Flat 003 - Living/Kitchen

The remaining rooms have been modelled with the previous vision panel dimensions and were found to pass. Increasing the dimensions of the vision panels would improve the average daylight factor, making no difference to the results.

### 7.3.2 BLOCK A

- I. Rearrangement of FLAT 007 (1B2P) from Level 02 upwards

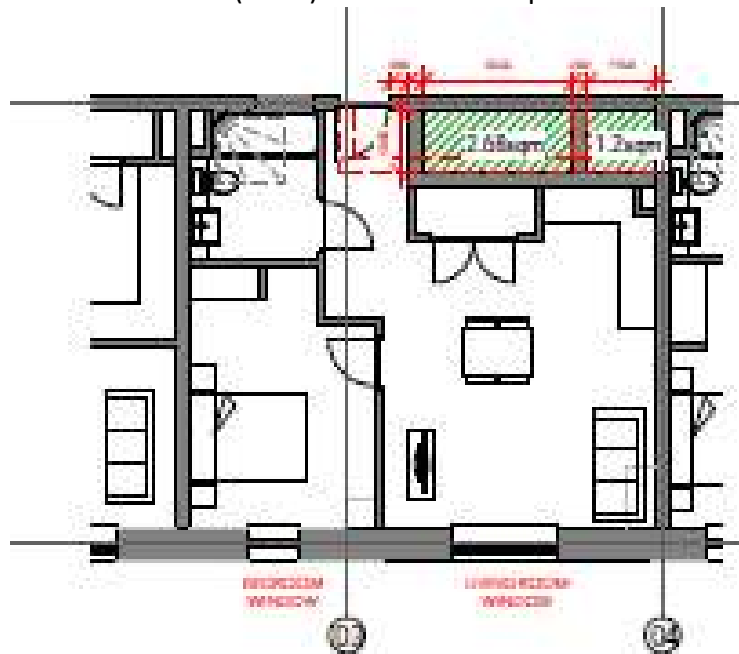


Figure 7.3.2.1 A02-A07 Flat 007 plan

### 7.3.3 BLOCK B

- II. TYPE-A1-1B2P can have the coat cupboard reinstated at the front door – Flats 01 and 03.
- III. TYPE-C1/2-2B4P needs a minor change to the wall position in front of the entrance door as dimensioned in Figure 7.3.3.1 (where the storage cupboard was removed, the wall should be pushed approximately 250mm towards entrance door wall).

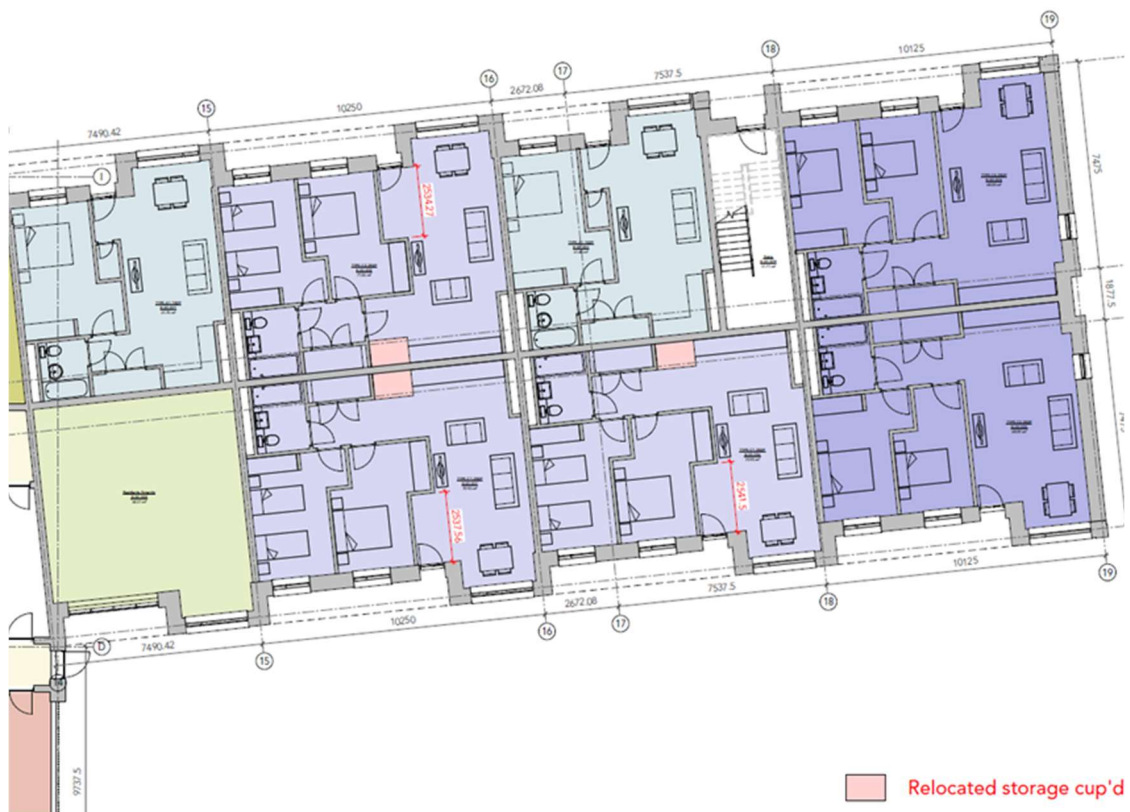


Figure 7.3.3.1 Block B ground floor changes

- IV. B02-B04 Flat 002 Bedroom 01 Window Panel changed to 1810x2350 mm as shown in Figure 7.3.3.2.2 and Figure 7.3.3.3.

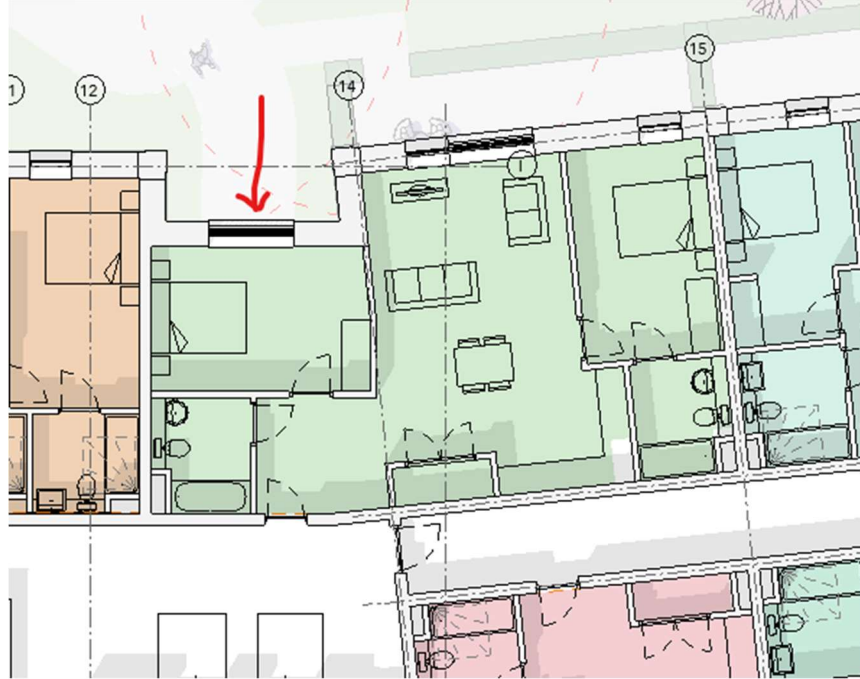


Figure 7.3.3.2 Plan of Block B Flat 002 Bedroom window position



Figure 7.3.3.3 Elevation changes to windows from Level 2 to Level 4 Flat 002 Bedroom 01, Block B north façade

### 7.3.4 OTHER MODIFICATIONS TESTED

An additional model was constructed of a sample room, including the balcony railings as shown below. The sample room “A02: Flat 006 - Living/Kitchen” selected was the worst-performing room from the overall model to have a Juliet balcony.

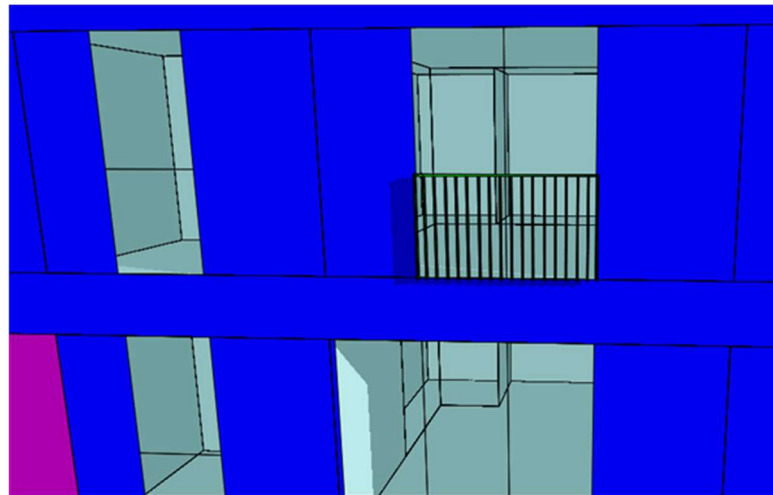


Table 7.3.4.1 Juliet balcony IES modelling for sample room

## 7.4 Appendix D - Internorm HF410 window

As stated in Section 4.1, the modelling shown in this report was conducted with a 50mm frame to all apartment block windows.

Towards the end of this phase of modelling, a window selection was made by the design team, the *Internorm HF410*, which has a wider frame at 70mm.

A study was conducted to assess the impact of the wider frame on a sample room. Room *B00-002-Living/Kitchen* was selected as it was the worst-performing room from the modelling shown in this report.

An elevation showing the dimensions of the window to this space is shown in Figure 7.4.1.

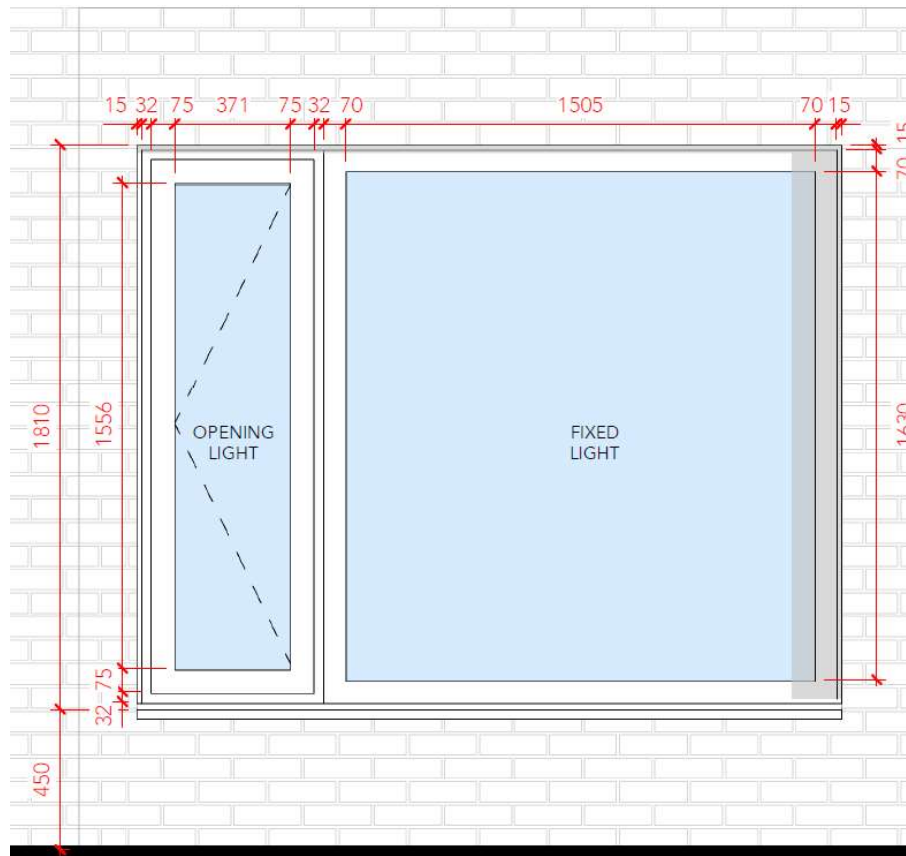


Figure 7.4.1 Elevation showing Internorm HF410 window to room B00-Flat 002-Living/Kitchen with dimensions

## Results

The results of the study are presented in Table 7.4.1.

| Scenario | Description                                   | Frames                               | Transmittance (%) | Average Daylight Factor (%) |
|----------|-----------------------------------------------|--------------------------------------|-------------------|-----------------------------|
| 1        | Baseline case with 50mm frame width           | As per Revit model (See Section 4.1) | 75                | 2.02                        |
| 2        | Updated window unit                           | HF410 Internorm                      | 75                | 1.80                        |
| 3        | Increasing transmittance                      | HF410 Internorm                      | 82                | 2.01                        |
| 4        | Raising vertical placement of window by 100mm | HF410 Internorm                      | 82                | 2.08                        |

Table 7.4.1 Impact of Internorm HF410 frame on average daylight factor

## Discussion

Scenario 2 shows that the increased frame width leads to a 11% reduction in average daylight factor relative to the baseline case, under which circumstance the space does not achieve the AECB average daylight factor target of 2%.

Room B00-Flat 002-Living/Kitchen had already been identified as requiring its windows to use glass with transmittance of at least 75%, along with three other ground floor living spaces. Scenario 3 shows that increasing the transmittance of the glass to 82% in both the Internorm HF410 window and the vision panel to the front door leads to an average daylight factor of 2.01%.

Whilst this does comply with the AECB average daylight factor target, any small design change that may reduce the daylight to the space would pose a risk to compliance. It is therefore recommended that the increase in transmittance of the glass be imposed in conjunction with another mitigation measure.

A further study was conducted to assess the impact of raising the vertical placement of the window by 100mm. As stated in BS 8206, *“the area of the window below the working plane is only about 15% as effective at letting light onto the working plane as an equivalent area above the working plane”*. Raising the window unit increases the area of the window that is above the working plane, thereby increasing the effectiveness of the window at letting light onto the working plane.

Scenario 4 shows that the combination of an increase in transmittance with raising the window by 100mm leads to an average daylight factor of 2.08%. This provides a 4% buffer over the AECB target, reducing the risk to compliance posed by any future small design changes.



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