



Daylight and Sunlight Study (Within Development)
7 The Chantry Centre, High St, Haverhill CB9 8AA

14 March 2024

Smith Marston Building Surveyors

WITHIN DAYLIGHT AND SUNLIGHT STUDY
23104 – 7 The Chantry Centre, High St, Haverhill CB9 8AA

CONTENTS

- 1 EXECUTIVE SUMMARY2**
- 1.1 Overview2
- 2 INFORMATION SOURCES3**
- 2.1 Documents Considered3
- 3 METHODOLOGY OF THE STUDY4**
- 3.1 BRE Guide : Site Layout Planning for Daylight and Sunlight **Error! Bookmark not defined.**
- 3.2 National Planning Policy Framework.....4
- 3.3 Interior Daylighting..... **Error! Bookmark not defined.**
- 3.4 Sunlight to Windows **Error! Bookmark not defined.**
- 3.5 Overshadowing to Gardens and Open Spaces **Error! Bookmark not defined.**
- 4 RESULTS OF THE STUDY9**
- 4.1 Window Reference Points and No Sky Line Contours9
- 4.2 Numerical Results..... **Error! Bookmark not defined.**
- 4.3 Interior Daylighting.....9
- 4.4 Sunlight to Windows9
- 4.5 Overshadowing to Gardens and Open Spaces10
- 4.6 Conclusion.....11
- 5 CLARIFICATIONS11**
- 5.1 General.....12
- 5.2 Project Specific..... **Error! Bookmark not defined.**

APPENDICES

- APPENDIX 1 WINDOW KEY**
- APPENDIX 2 DAYLIGHT PROVISION DATA & CONTOURS**
- APPENDIX 3 EXPOSURE TO SUNLIGHT DATA**

1 EXECUTIVE SUMMARY

1.1 Overview

- 1.1.1 Smith Marston Building Surveyors have been commissioned by Delta Tech Ltd to undertake a daylight and sunlight study in connection with the development of two first floor flats at 7 The Chantry Centre, High St, Haverhill CB9 8AA. The aim of the study is to check whether the proposed accommodation will provide its future occupiers with adequate levels of natural light.
- 1.1.2 The assessment is based on the numerical tests laid down in the Building Research Establishment (BRE) guide 'Site Layout Planning for Daylight and Sunlight: a good practice guide, 3rd Edition' 2022.
- 1.1.3 Appendix 1 identifies the windows analysed in this assessment. Daylight provision data and contours for the habitable rooms are presented in Appendix 2. Exposure to sunlight data is provided in Appendix 3.
- 1.1.4 Both flats currently fail the BRE daylight recommendations by a significant margin. Improvements are recommended to provide more daylight; additional windows or rooflights will assist as would the consideration of the rooms depths. Sunlight to Studio 1 exceeds the BRE's minimum requirements, but Studio 2 falls marginally short due to its orientation.

2 INFORMATION SOURCES

2.1 Documents Considered

2.1.1 This report is based on the following drawings:

Delta Tech Ltd

CHN7/24/04	Location Plan	Rev -
CHN7/24/05	Proposed Site Plan Ground Floor Plan, First Floor Plan	Rev -
CHN7/24/06	Proposed Roof Plan, Front Elevation	Rev -
CHN7/24/07	Proposed Rear Elevation, Side Elevation	Rev -

3 METHODOLOGY OF THE STUDY

3.1 Local Planning Policy

- 3.1.1 We understand that the Local Authority takes the conventional approach of considering daylight and sunlight amenity with reference to the various numerical tests laid down in the Building Research Establishment (BRE) guide 'Site Layout Planning for Daylight and Sunlight: a guide to good practice, 3rd Edition' by P J Littlefair 2022. The BRE guide is based on European standard BS EN 17037 'Daylight in Buildings', 2019 (BS EN 17037).
- 3.1.2 The standards set out in the BRE guide are intended to be used flexibly. The BRE guide states:
- 3.1.3 "The guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly, since natural lighting is only one of many factors in site layout design."
- 3.1.4 In reference to applying different numerical target values in different locations, the BRE guide states:
- 3.1.5 "These values are purely advisory and different targets may be used based on the special requirements of the proposed development or its location."

3.2 National Planning Policy Framework

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

"Local planning authorities should refuse applications which they consider fail to make efficient use of land, taking into account the policies in this Framework. In this context, when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they

would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide acceptable living standards).”

3.3 National Planning Practice Guidance

3.3.1 The BRE numerical guidelines should also be considered in the context of the National Planning Practice Guidance (NPPG). The NPPG states that developments should maintain acceptable living standards. It goes on to explain that what this means in practice is that appropriate levels of sunlight and daylight, will depend to some extent on the context for the development. This is consistent with the BRE guide which as noted in paragraphs 3.1.4 to 3.1.5 above, states that site location is a relevant factor when setting sunlight and daylight targets.

3.4 Interior Daylighting

3.4.1 The BRE guide recommends that interior daylighting is checked using the daylight provision test set out in BS EN 17037. The test measures both the amount of daylight, as well as the distribution of daylight within a room.

3.4.2 The assessment is carried out using a grid of points on a horizontal reference plane in each room. In accordance with the BRE recommendations, we have set the reference plane at 850mm above the floor and have excluded assessment points from a 0.3m wide band around the perimeter of each room.

3.4.3 The UK National Annex to BS EN 17037 gives UK specific minimum illuminance recommendations which we have set as the targets for this project. The targets comprise of 100 lux in bedrooms, 150 lux in living rooms and 200 lux in kitchens to be exceeded over at least 50% of the reference plane.

3.4.4 Where a room has a shared use, the highest target should apply. However, the BRE guide explains that local authorities could use discretion here. The guide gives the example where the target for a living room could be used for a combined living/dining/kitchen area if the kitchens are not treated as habitable spaces, as it may avoid small separate kitchens in a design.

3.4.5 The data in Appendix 2 includes the lux target we have assigned to each room, together with the percentage of the reference plane that meets the target. The median illuminance (lux) achieved for each room is also presented. Where the

median illuminance exceeds the lux target, this means the lux target has been achieved over at least 50% of the assessment grid.

- 3.4.6 The daylight provision test may be carried out using either the daylight factor method, or the interior illuminance method. For the purpose of this assessment, we have adopted the daylight factor method. Using the conversion table set out in the BRE guide, we have expressed the results in terms of lux.
- 3.4.7 Since the assessment is based on a computer simulation, it is necessary to set various surface reflectance values. For example, a 0.6 reflectance means that 60% of the light hitting the surface will be reflected. The BRE guide states that it is necessary to make an allowance for the deterioration of surface finishes. Furniture within the rooms will also have an impact on daylight provision. Since the computer model used in the simulation does not include furniture, the BRE guide recommends that an allowance for this is also made within the reflectance values. For this reason, we have set out below, both the manufacturer's reflectance values, and the values used in the simulation.
- 3.4.8 The simulation values include allowances for furniture and the deterioration of the surfaces. Should product substitutions be required, products with equal reflectance values should be chosen to ensure the daylight results presented in this report are achieved.

Surface	Product	Product Reflectance	Simulation Reflectance
Interior walls	Dulux Light & Space Absolute White	0.93	0.8
Ceilings	Dulux Light & Space Absolute White	0.93	0.8
Floors	Kahrs engineered wood (Ash Coral)	0.62	0.4
Development cladding	BRE default value	n/a	0.2
Balcony floors	Portland stone	0.6	0.5
Balcony soffits	Dulux Weathershield Brilliant White	0.92	0.6
Neighbouring buildings	BRE default value	n/a	0.2
Mirror	Generic value	n/a	0.95
Glass	Generic value	n/a	0.1
Exterior ground	BRE default value	n/a	0.2

- 3.4.9 The simulation is based on double-glazed windows with a glazed area that equates to 80% of the structural opening size. The glazing consists of a Pilkington 4mm Optifloat Clear outer pane and a Pilkington 6.4mm OptiLam K Glass S inner pane, which has an overall manufacturer's direct transmittance of 0.82. In accordance with the BRE guide, the simulation includes maintenance factors to allow for the effect of dirt on the glazing.

3.5 Exposure to Sunlight

- 3.5.1 The BRE guide states that the main requirement for sunlight is in living rooms, where it is valued at any time of day but especially in the afternoon. Sunlight is also required in conservatories. It is viewed as less important in bedrooms and in kitchens, where people prefer it in the morning rather than the afternoon.
- 3.5.2 The BRE guide states that, in general, a dwelling will appear reasonably sunlit provided:
- at least one main window wall faces within 90 degrees of due south, and
 - a habitable room, preferably a main living room, can receive a total of at least 1.5 hours of sunlight on 21 March.
- 3.3.1 The guide states that, where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings with a main living room that meets the above recommendations.

3.6 Trees and Hedges

- 3.6.1 Appendix G of the BRE guide gives guidance on trees and hedges. The guide states that trees and hedges vary in their effects on skylight and sunlight and most tree species will cast partial shade.
- 3.6.2 In accordance with the BRE guide, we have factored the transparency and reflectance characteristics of any nearby trees and hedges into the daylight and sunlight calculations. Tables G1 and G2 in Appendix G of the BRE guide outline the transparency and reflectance values for a number of common tree types, which we used as a basis for our assessment.
- 3.6.3 When applying the daylight provision test to a property which has deciduous trees surrounding it, the calculations are repeated for summer and winter conditions. In the winter, when the tree crown has a much higher transparency, more light is able to penetrate through the branches. Therefore, in the winter daylight provision is usually higher than in the summer when the tree is in full bloom.
- 3.6.4 The BRE guide notes that, if the recommended daylight provision targets are exceeded in both summer and winter, then daylight would be considered adequate. The guide adds that, for a room where the minimum value is exceeded in winter but

not in summer, daylight provision year-round is still likely to be adequate, but it is clear that the trees are having some effect on daylight.

- 3.6.5 The BRE guide recommends that where trees may affect exposure to sunlight, the calculations should first be carried out with deciduous trees treated as opaque objects. The calculations should then be repeated without deciduous trees entirely. This gives the range of potential sunlight hours. Evergreen trees and hedges should also always be assessed as opaque objects.
- 3.6.6 If the minimum recommendation is met with opaque trees, then sunlight would be adequate. If the minimum recommendation is not reached with either opaque trees or no trees, then sunlight would be considered inadequate. For a room where the recommendation is exceeded without trees, but not with opaque trees, sunlight provision may be adequate, but the trees will have some effect on the sunlight received.

4 RESULTS OF THE ASSESSMENT

4.1 Window Analysed

4.1.1 Appendix 1 identifies the windows serving habitable rooms analysed in this assessment.

4.2 Interior Daylighting

4.2.1 Daylight provision data and contours for the habitable rooms are presented in Appendix 2.

4.2.2 The daylight results (both in summer and winter) show that the two new studios will not meet the targets set out in the BRE Guide.

4.2.3 Studio flat 1, served by window 1, will only achieve a median illuminance of 48 lux. This is substantially lower than the requirement for a living room (150 lux) and kitchen (200 lux). It is noted that this studio is deeper than studio flat 2. Deep rooms are inherently harder to naturally light than shorter ones. Consideration may wish to be given to making both flats the same depth, reducing the overall depth of studio flat 1.

4.2.4 It is also noted that a proportion of the outside wall that incorporates windows to Studio 1 is taken up by the non-habitable bathroom area. As bathrooms do not require natural light, consideration may wish to be given to moving this room to the rear wall of the studio flat. This would allow additional windows to serve the living/dining/kitchen area of the studio whilst at the same time, reducing the depth of the room further. This is of course only if such configuration would be possible from a constructional perspective (drains etc). See overleaf.



4.2.5 Studio flat 2, served by window 2, will only achieve a median illuminance of 119 lux. This too is lower than the requirement for a living room (150 lux) and kitchen (200 lux). Again, this unit only has one small window – this is too small to enable sufficient daylight into this unit. Consideration should be given to addition of an extra window, or roof lights.

4.3 Exposure to Sunlight

4.3.1 Exposure to sunlight data is provided in Appendix 3.

4.3.2 Only Studio 1 has at least one living room window that faces within 90 degrees of due south. Studio 2 faces north east and thus has no access to sunlight. Studio 1 will receive 3.4 hours of sunlight of 21 March. This is more than the minimum target of

1.5 hours of sunlight on 21 March required by the BRE. The proposed development therefore satisfies the BRE exposure to sunlight requirements with regards to this flat.

4.3.3 The BRE guide acknowledges that in some cases, it may not be possible for every dwelling to achieve ideal levels of sunlight. The guide explains that where groups of dwellings are planned, site layout design should aim to maximise the number of dwellings with a main living room that:

- faces within 90 degrees of due south, and
- can receive a total of at least 1.5 hours of sunlight on 21 March.

4.3.4 In our opinion, the proposed development represents good site layout design. Since the design maximises sunlight availability, as far as practically possible given the constraints of the site, the BRE exposure to sunlight recommendations for groups of dwellings have been met.

4.4 Conclusion

4.4.1 Both flats currently fail the BRE daylight recommendations by a significant margin. Improvements are recommended to provide more daylight; additional windows or rooflights will assist as would the consideration of the rooms depths.

5 CLARIFICATIONS

5.1 General

- 5.1.1 The report provided is solely for the use of the client and no liability to anyone else is accepted.
- 5.1.2 The study is limited to assessing daylight and sunlight of the proposed development as set out in section 2.1 and 3.1 of the BRE Guide.
- 5.1.3 The assessment is based on the information listed in section 2 of this report. The assessment has been undertaken without access to the proposed development site or neighbouring properties.
- 5.1.4 We have undertaken the survey following the guidelines of the RICS publication "Surveying Safely". Where limited access is available, assumptions will have been made.
- 5.1.5 This report is based upon and subject to the scope of work set out in Smith Marston Building Surveyor's quotation and standard terms and conditions.

APPENDICES

**APPENDIX 1
WINDOW KEY**



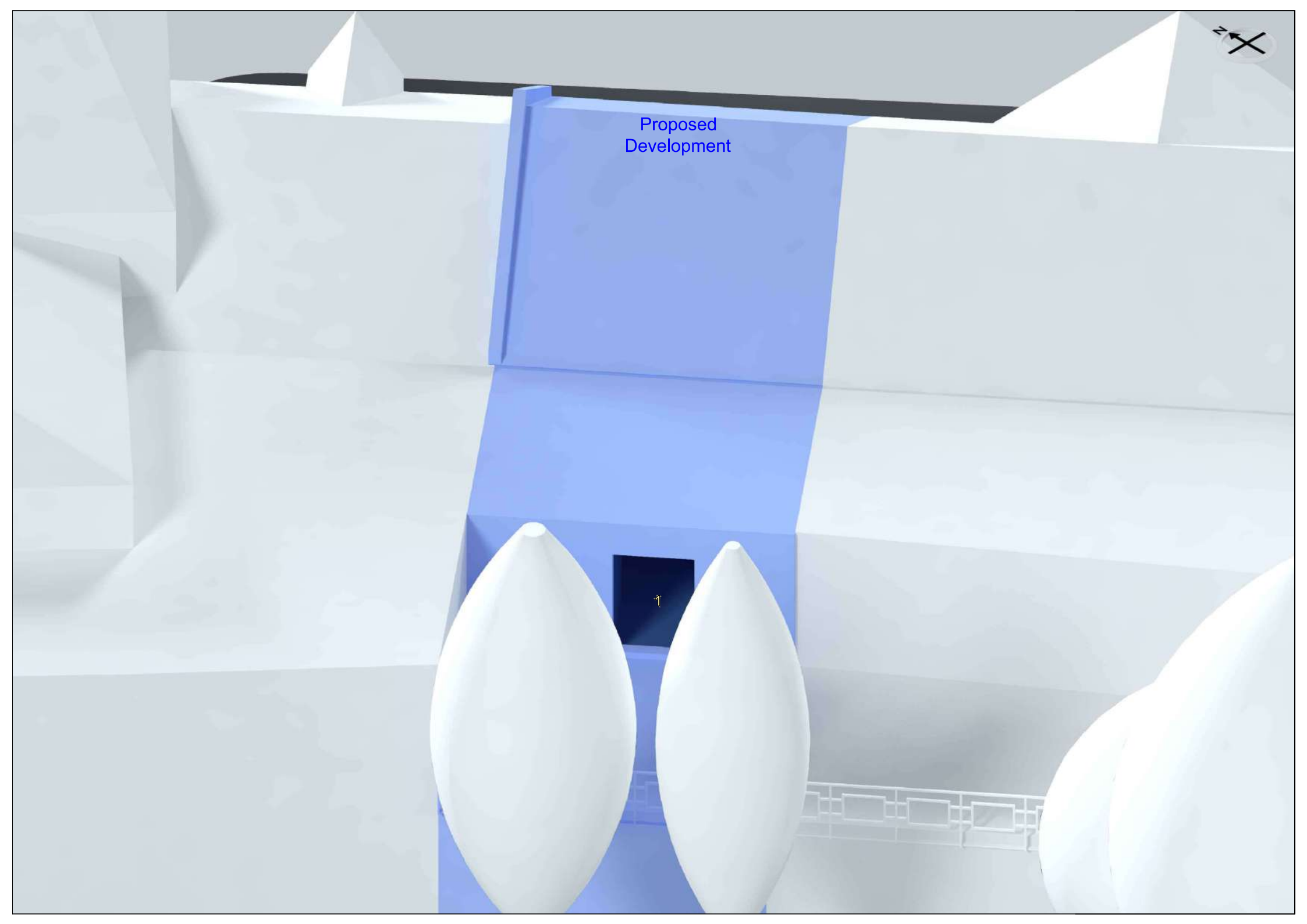
Proposed
Development

2



Proposed
Development

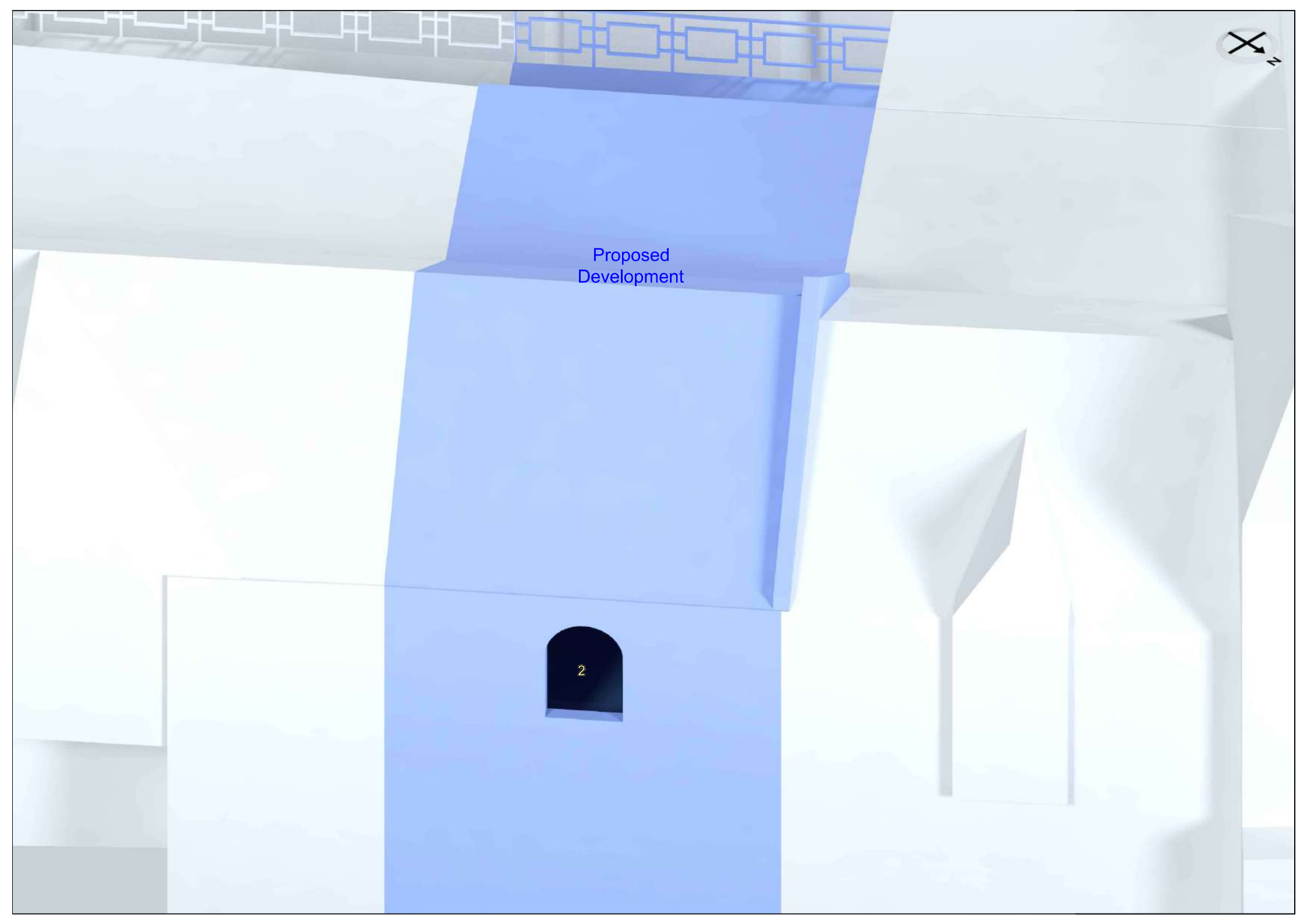
1





Proposed
Development

2





Proposed
Development

1

APPENDIX 2
DAYLIGHT PROVISION DATA & CONTOURS

Appendix 2 - Daylight Provision (Summer)

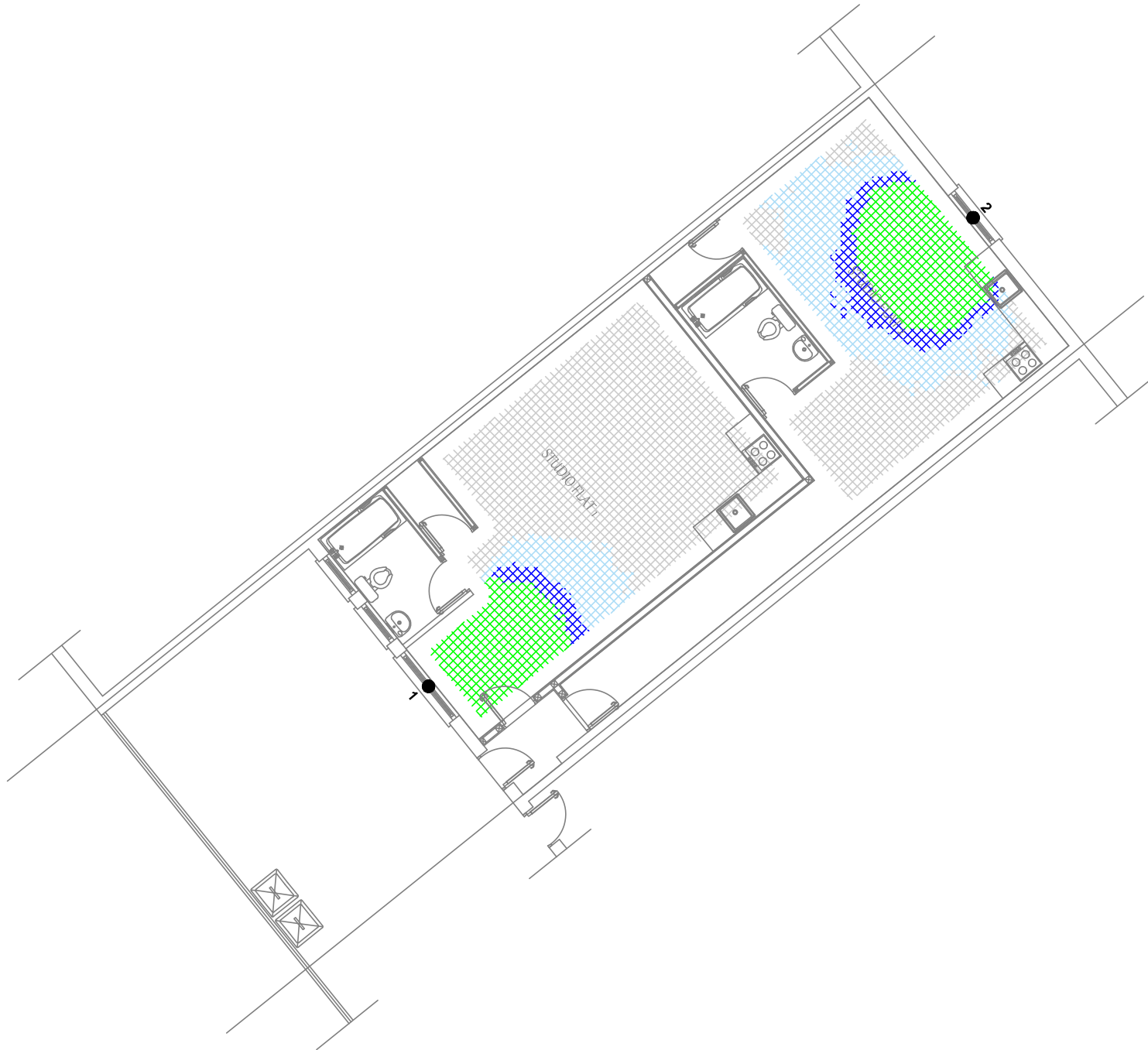
7 The Chantry Centre, High St, Haverhill CB9 8AA

Reference	Room Use	Min.Target Illuminance (Lux)	Target % of Reference Plane	% of Reference Plane Achieved	Target % Achieved	Median Illuminance (Lux)
-----------	----------	------------------------------	-----------------------------	-------------------------------	-------------------	--------------------------



7 The Chantry Centre

First Floor

Window 1	Studio 1	200	50%	13%	No	48
Window 2	Studio 2	200	50%	24%	No	119



Key:

-  200 lux and above
-  150 lux to 199 lux
-  100 lux to 149 lux
-  Below 100 lux
-  Window reference

Rev	Date	Description



CHARTERED BUILDING SURVEYORS
 email: info@smithmarston.co.uk



Drawing Title: Daylight Provision Contours

Scale: Do not scale

Appendix 2 - Daylight Provision (Winter)

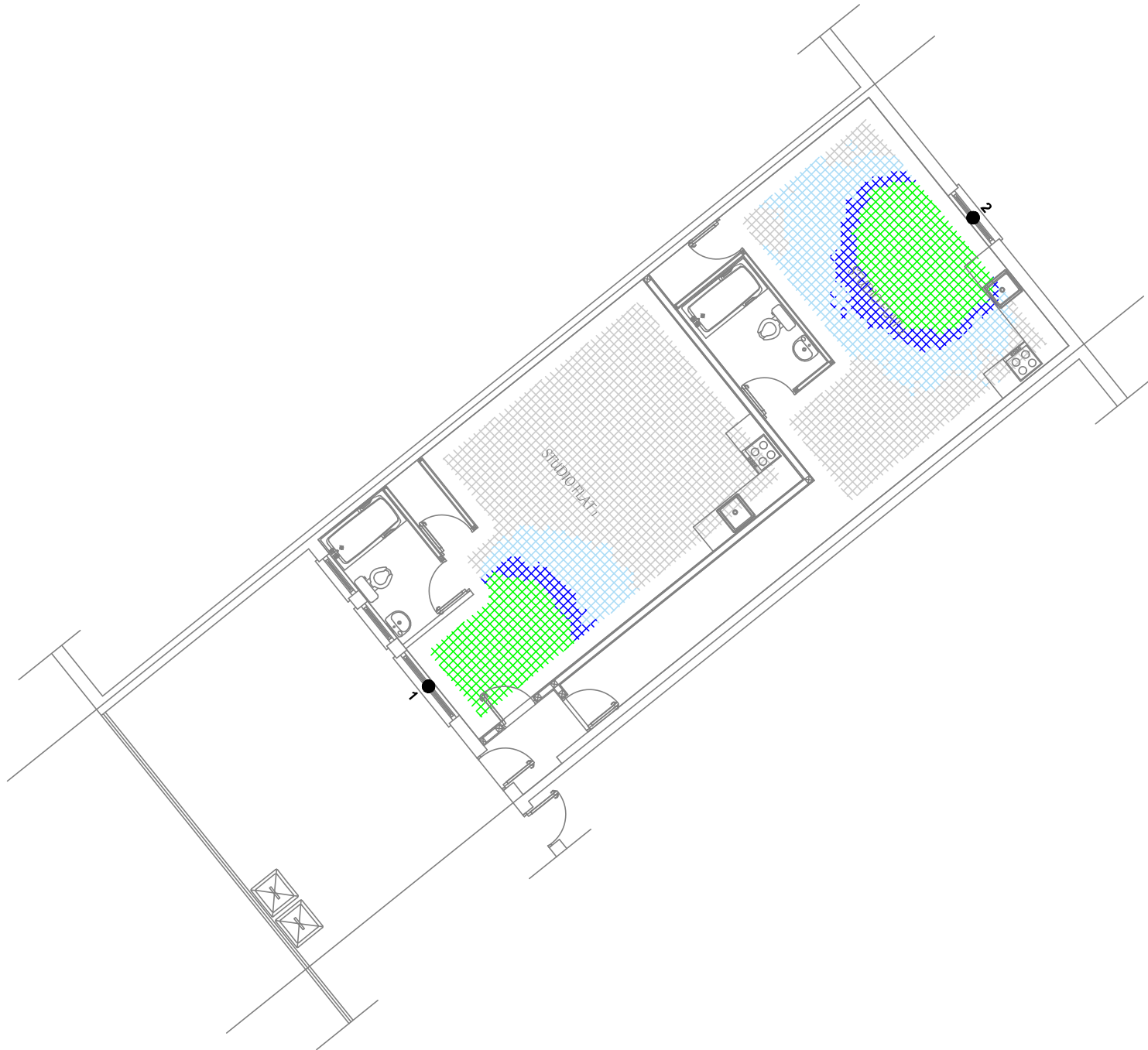
7 The Chantry Centre, High St, Haverhill CB9 8AA

Reference	Room Use	Min.Target Illuminance (Lux)	Target % of Reference Plane	% of Reference Plane Achieved	Target % Achieved	Median Illuminance (Lux)
-----------	----------	------------------------------	-----------------------------	-------------------------------	-------------------	--------------------------


7 The Chantry Centre


First Floor


Window 1	Studio 1	200	50%	15%	No	55
Window 2	Studio 2	200	50%	24%	No	119




Key:

 200 lux and above

 150 lux to 199 lux

 100 lux to 149 lux

 Below 100 lux

 Window reference

Rev	Date	Description

SMITH MARSTON
Building Surveyors

CHARTERED BUILDING SURVEYORS
email: info@smithmarston.co.uk



Drawing Title: Daylight Provision Contours

Scale: Do not scale

**APPENDIX 3
EXPOSURE TO SUNLIGHT DATA**

Appendix 3 - Sunlight Exposure (Including Trees)
7 The Chantry Centre, High St, Haverhill CB9 8AA

Reference	Room Use	Target Sunlight Exposure	Sunlight Exposure Achieved	At least one room meets Sunlight Exposure Target
<u>7 The Chantry Centre</u>				
<u>First Floor</u>				
Window 1	Studio 1	1.5 hours	3.4 hours	Yes
Window 2	Studio 2	1.5 hours	1.3 hours	No

Appendix 3 - Sunlight Exposure (Excluding Trees)
7 The Chantry Centre, High St, Haverhill CB9 8AA

Reference	Room Use	Target Sunlight Exposure	Sunlight Exposure Achieved	At least one room meets Sunlight Exposure Target
<u>7 The Chantry Centre</u>				
<u>First Floor</u>				
Window 1	Studio 1	1.5 hours	5.8 hours	Yes
Window 2	Studio 2	1.5 hours	1.3 hours	No