31 DALEHAM GARDENS, LONDON

Daylight & Sunlight Assessment – Revision E

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Daylight & Sunlight Assessment

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Contents

Appendices

Registration of Amendments

Revision and Date	Amendment Details	Revision Prepared By	Revision Approved By
Rev-A 30/10/2023	Updated as No Sky Line assessment was included as per the comments received in the letter and a new appendix G for NSL has been added.	MB	SS
Rev-B 01/11/2023	Added a new Appendix H-Internal Daylight report	MB	SS
Rev C 06/11/2023	Updated the reports as per the received comments	MB	SS
Rev D 08/11/2023	Updated Appendix I, as per the received comments	MB	SS
Rev E 22/01/2024	Updated Appendix F, as per the received comments	MB	SS

EXECUTIVE SUMMARY

This report assesses the level of daylight and sunlight provision for the proposed new development located at 31 Daleham Gardens in Hampstead and Kilburn in the London Borough of Camden and examines the proposed development's impact on the neighbouring properties and amenity areas.

The development will comprise of 6-storey residential block from lower ground floor to 4th floor, with creating 14 flats.

This assessment has been undertaken following the guidance given in the Building Research Establishment's (BRE) Publication 'Site Layout Planning for Daylight and Sunlight', 2022 Edition. It calculates the Vertical Sky Component (VSC), Illuminance Levels (Lux) and Annual Probable Sunlight Hours (APSH) for the proposed units and reviews these values in line with BRE guidance. For the existing buildings in the vicinity of the site, the assessment determines the overall reduction in VSC for the relevant windows within the dwellings, which will be experienced following the construction of the proposed extension. It also assesses the APSH for existing living spaces.

Results for the proposed development

The assessment finds that all of relevant spaces meet the BRE guidance for the recommended level of daylight in new developments.

An assessment of access to sunlight has also been carried out for all living rooms with windows facing within 90 degrees of south. The results confirm that the modelled spaces have achieved the recommended values for average annual and winter sunlight exposure.

Results for existing spaces

The assessment confirms that the majority of the existing neighbouring buildings' access to daylight and sunlight will not be affected by the proposed development.

The existing buildings near the proposed development at 31 A, 32, 32A, and 32B Daleham Gardens pass the '0.8 times the former value' check, as per the BRE guidance. The only building that does not comply with the '0.8 times the former value' check is Gloucester School.

The windows that will experience a loss of annual and winter sunlight hours are windows serving Gloucester House School, on the south, close to the existing part of 31 Daleham Gardens block. The assessment carried out for the existing scenario shows that the above-mentioned windows already receive a very minimal amount of sun during the winter period, well below the BRE recommendation. These windows are positioned closed to the common boundary fencing of Gloucester house school and proposed building due to which the windows experiences low level of daylight and sunlight. This confirms that the current block was not designed with access to sunlight in mind and that there is a very limited scope to maintain or improve on its daylight and sunlight levels. Additional analysis,

including a No Sky line and Illuminance check, was carried out for the failing room at Gloucester School. The illuminance check results confirm that 100% of the room area will receive an average of 300 lux.

Amenity areas

It is concluded that there are no external amenity areas that would be impacted on by the proposed extension.

Conclusion

It is concluded that the proposed development will have a satisfactory level of daylight and sunlight in all new spaces and will have a small impact on the internal day – and sun-light levels in the neighbouring buildings. The impact caused is deemed typical to the developments in dense urban environment and should not be noticeable to current residents of the neighbouring buildings.

1.0 INTRODUCTION

1.1 Create Consulting Engineers Ltd has been commissioned by Mole Architects Ltd to undertake a Daylight & Sunlight Assessment to support an application for planning permission for the residential roof extension at 31 Daleham Gardens located in the London Borough of Camden. This report assesses the impact of the development proposals on the daylight and sunlight availability on the proposed dwellings and neighbouring dwellings surrounding the block and compares them to the current existing site conditions.

Site Description and Location

1.2 The proposal is to construct a new 5-storey residential block from lower ground floor to fourth floor to create 14 flats. The existing block has four side and is an open land with fencing, facing the east. Please refer to Figures 1.1 and 1.2 below for the proposed site location and plan.

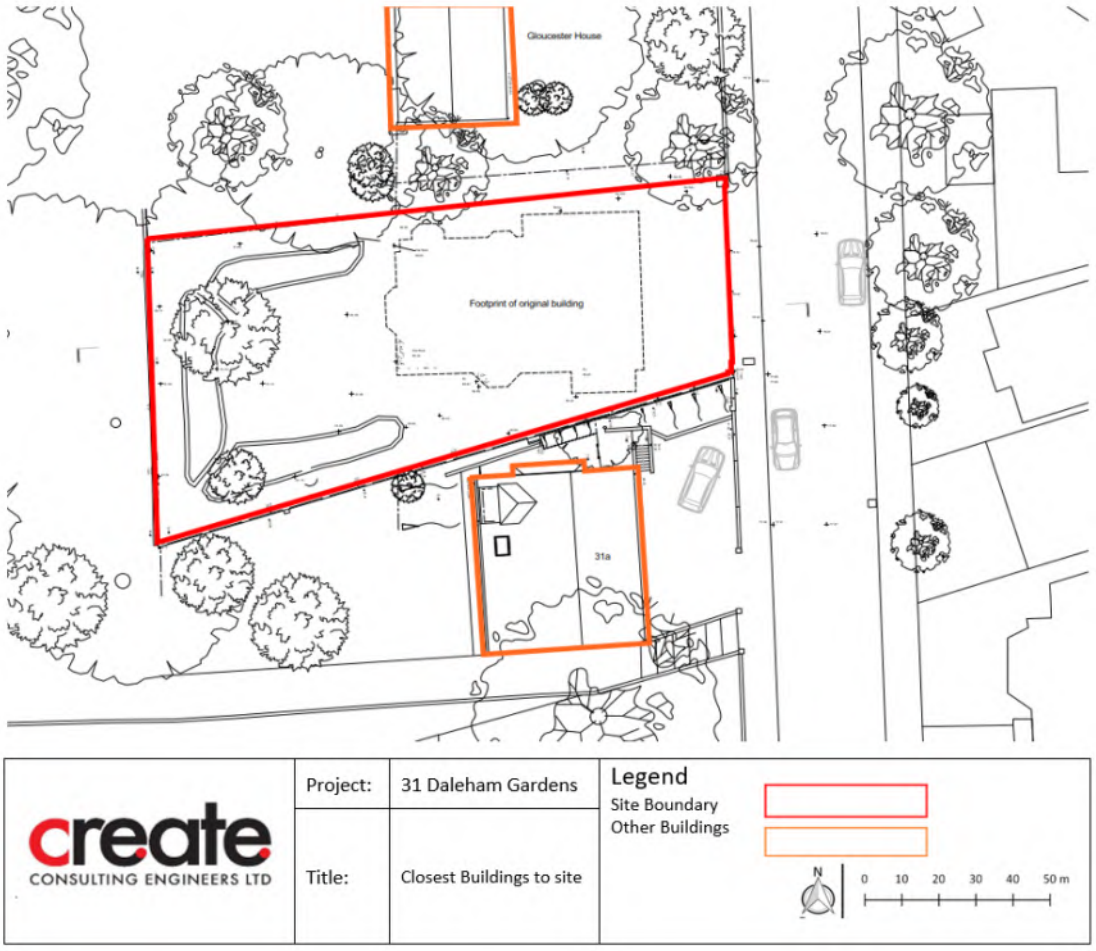

Figure 1.1: Proposed site boundary and surrounding buildings (source: Mole Architects)

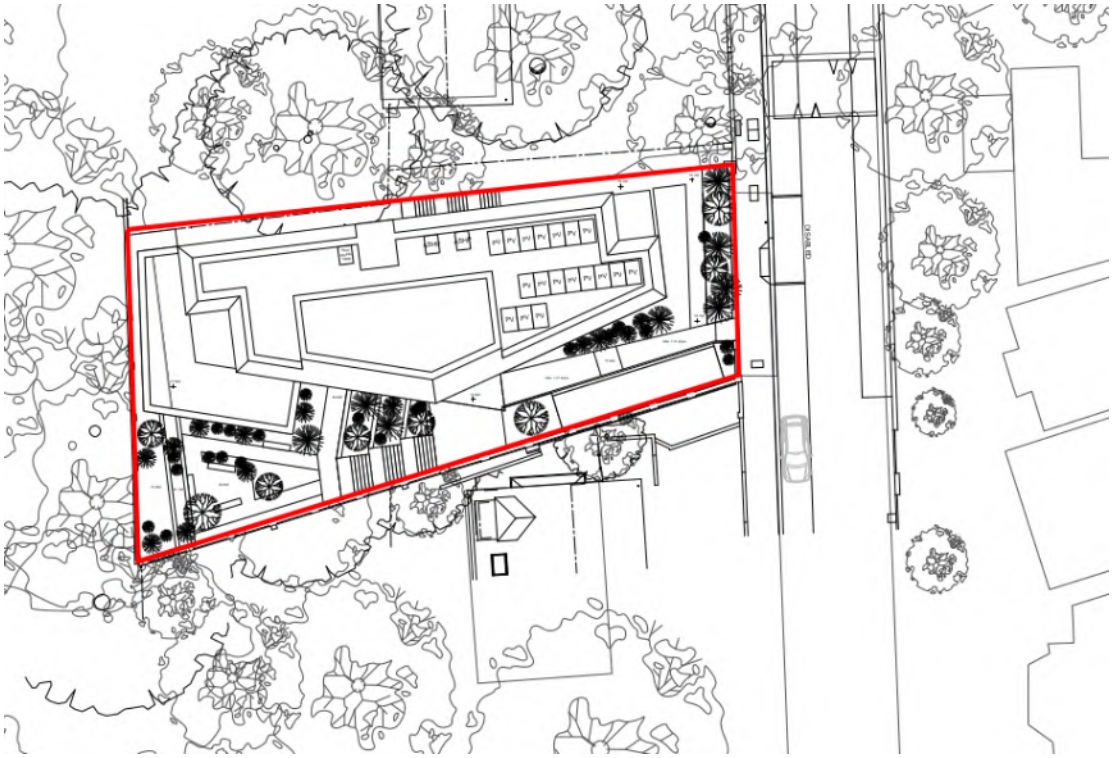

Figure 1.2: Proposed site plan (source: Mole Architects)

1.3 The Site (31 Daleham Gardens) consists of a residential block located to the south of Gloucester House School, approximately 0.5 miles southwest of Finchley Road Underground Station.

Assessed Spaces

1.4 Following the BRE guidance, the following spaces must be included in the assessment:

- For the daylight study – All living rooms, kitchens, bedrooms, and studies in the new proposal and in the neighbouring properties, on affected elevations;
- For the sunlight study - all living rooms facing within 90 degrees of due south, located in the proposed development and in the surrounding dwellings (where floor layout is known);
- For the over-shading study – all private gardens and communal sitting areas potentially overshaded by the proposed development.

Policy Context

Camden Local Plan – Policy A1 Managing the Impact of Development (2017)

1.5 *"The Council will seek to protect the quality of life of occupiers and neighbours. We will grant permission for development unless this causes unacceptable harm to amenity.*
We will:

a. seek to ensure that the amenity of communities, occupiers and neighbours is protected;
b. seek to ensure development contributes towards strong and successful communities by balancing the needs of development with the needs and characteristics of local areas and communities;
c. resist development that fails to adequately assess and address transport impacts affecting communities, occupiers, neighbours and the existing transport network; and
d. require mitigation measures where necessary.
The factors we will consider include:
e. visual privacy, outlook;
f. sunlight, daylight and overshadowing;
g. artificial lighting levels;
h. transport impacts, including the use of Transport Assessments, Travel Plans and Delivery and Servicing Management Plans;
i. impacts of the construction phase, including the use of Construction Management Plans;
j. noise and vibration levels;
k. odour, fumes and dust;
l. microclimate;
m. contaminated land; and
n. impact upon water and wastewater infrastructure."

1.6 The document requires that all new buildings be orientated to have less impact on existing buildings without affecting the quality of life of occupiers and neighbours.

Camden Planning Guidance – Amenity (January 2017)

1.7 This document confirms that the BRE guidance on assessing the level of daylight and sunlight in new and existing buildings should be followed.

1.8 The Validation Checklist issued for minor and major developments also states that where the proposed development may have a potentially adverse effect on the daylight and/or sunlight enjoyed by adjoining properties a Daylight/Sunlight Assessment is required to be submitted with the planning application.

2.0 CALCULATION METHODOLOGY

Guidance and Software Used

2.1 The provision of daylight access has been assessed based upon the guidance and methodologies detailed in the Building Research Establishment's (BRE) Guide 'Site Layout and Planning for Daylight and Sunlight – a Good Practice Guide', 2022 Edition.

2.2 The assessment model was produced using IES VE version 2022.2.0.0, a full dynamic simulation modelling software capable of performing a variety of environment simulations for large and complex buildings. IES VE can produce accurate predictions of several lighting parameters through its SunCast and RadianceIES modules.

25 Degree Line Check

2.3 The 25 degree line check is an initial quick test to determine if a new development will impact upon the amount of daylight received by the surrounding buildings, as well as assessing whether the surrounding buildings will impact upon the amount of daylight received within the proposed development.

2.4 The 25 degree line check consists of drawing a line in a sectional view from the highest obstructing point to the centre of the assessed window. If the angle of this line exceeds 25° from the perpendicular, then the amount of daylight received by the window is likely to be affected.

2.5 For areas identified as failing the 25 degree line check, the BRE guide presents two additional methods for more in-depth daylight analysis. These are the Vertical Sky Component (VSC) and Average Daylight Factors (ADF).

45 Degree Line Check

2.6 The 45 degree line check is applicable to extensions or new parts of the development where part of the building is perpendicular to the potentially affected windows. It involves drawing a line on elevation at an angle of 45 degrees away from the near top corner of the perpendicular extension and drawing another line on the plan, also at 45 degrees angle, back towards the window wall from the end of the extension.

2.7 The 45 degree line check is not applicable for this site as the main parts of the proposed building are not perpendicular to any of the existing residential buildings.

Vertical Sky Component (VSC)

2.8 The Vertical Sky Component is a measure of the amount of skylight incident on a vertical plane. It is most commonly applied to the light incident at the centre of a window, and in this sense is a measure of the potential for good day light. The VSC is calculated by taking the ratio of the skylight incident at a point to the unobstructed skylight available at that same point on a horizontal plane. For a uniform sky, the maximum value is 50% (since the point is on a vertical plane, clearly only half the hemisphere can contribute). For a CIE sky, which for the purposes of the daylight & sunlight study is a standard overcast sky, the maximum value is 39.6%. VSC calculations have been undertaken using computer-based simulation.

Illuminance Check

2.9 The illuminance recommendations are based around the illuminances that would be met or exceeded over half of the room, over half of daylight hours over the year. BS EN 17037 gives a range of recommendations for high, medium and minimum daylight provision. The National Annex A also gives minimum values for housing in living rooms, kitchens and bedrooms. These are minimum recommended values for locations where a predominantly daylit appearance is not achievable, e.g., where external obstructions are present.

Sunlight Analysis

2.10 The measure of sunlight that a given window may expect over a year period is known as the Annual Probable Sunlight Hours (APSH) and expressed as a percentage. Due to the sun's path across our sky, north facing windows are able to receive direct sunlight on only a small number of occasions per year and windows facing east or west will typically only receive sunlight in the morning or evening. Therefore, BRE guidance states that only windows with an orientation 90° of south need be assessed.

2.11 Sunlight access and overshading impact have been determined using a 3D computer simulation of the proposed development and a sun path calculation tool to determine the difference in direct solar exposure between the existing and proposed developments.

Limitations and Assumptions

2.12 The following assumptions and limitations have been made within this assessment:

- Location and sizes of openings to the assessed neighbouring dwellings at 31A, 32, 32A, 32B Daleham and Gloucester House School are based on street view photographs and the site topographical survey provided by the client as well as historic drawings and sales documents available online.
- Ground topography has been simplified based on the site topographical survey drawing prepared by Mole Architects, dated June 2022.

- Reflectance and transmittance values for all glazing as well as for external walls, balconies, internal walls and ceilings are based on information acquired from the IES Construction Database and to align with the BRE recommendations.

3.0 25 DEGREE LINE TEST

3.1 The 25 degree line check is used as a first pass assessment of the potential impact on daylight access for a given window area opposing a potential source of shading.

3.2 The 25 degree line check involves using a sectional view to draw a line from the centre of the window in question to the highest point of the obstructing object. If the angle of this line is greater than 25 degrees to the horizontal it indicates daylight access may be affected.

3.3 Based on the site location plan and the proposed floor plan it has been determined that the 25 degree line has been encroached by the proposed development and further compliance checks have been carried out.

3.4 The BRE Guide suggests that the daylight levels in existing buildings, where the 25 degree line check has failed, should be examined using VSC method. This has been described in more detail in the following section.

3.5 The proposed development at Daleham Gardens will impact the existing developments at 31A, Gloucester School, 32, 32A, and 32B in Daleham Gardens. The proposed development does not meet the 25-degree requirement. If the proposed building exceeds the 25-degree line in any way, it is likely that further tests will be necessary to determine the exact impact of the proposed development on daylight for the existing properties. If the obstructing building is taller than the 25-degree line, it is still possible to achieve good daylighting, provided the obstruction is not continuous and is narrow enough to allow daylight around its sides.

Figure 3.1: 25 Degree Line check

4.0 VERTICAL SKY COMPONENT

4.1 The VSC calculation has been assessed against the guidance given in the BRE publication 'Site Layout Planning for Daylight and Sunlight'. The VSC check is used to assess the daylight access to a vertical surface such as a window. VSC calculations produce a value between 0 and 40%.

4.2 If the calculated VSC for a window is greater than 27% then the window is considered to receive enough skylight. If the VSC for the buildings surrounding the proposed development, is both less than 27% and less than 0.8 times its former value ('existing' case), occupants of the existing building will notice the reduction in the amount of skylight.

4.3 Comments by the Greater London Authority (GLA), in the context of a planning appeal, are also noted:

> *"It should, nevertheless, be noted that the 27% VSC target value is derived from a low-density suburban housing model. The independent daylight and sunlight review states that in an inner-city urban environment, VSC values more than 20% should be considered as reasonably good, and that VSC in the mid-teens should be acceptable. However, where the VSC value falls below 10% (to be in single figures), the availability of direct light from the sky will be poor."*
>
> Source: Greater London Authority, representation hearing report D&P/3067/03 – Appendix 1, 18/11/2013

4.4 VSC check should be carried out for all 'main windows' which are defined as openings serving living rooms, dining rooms, studies, kitchens and bedrooms. Windows to bathrooms, toilets, storerooms and circulation do not have to be analysed.

4.5 VSC checks have been undertaken for all of the openings to main rooms within the proposed development and relevant openings in existing neighbouring buildings.

4.6 It should be noted that the VSC check measures the illuminance of a surface, as opposed to the level of light that is transmitted through an opening. Subsequently, the precise geometric dimensions of any window or surface assessed are less important than its relative position to any obstructions.

Results of the calculations for the proposed development

4.7 The numerical results of the VSC calculations for all the assessed windows calculated for the proposed development are detailed in Appendix A. The results confirm that the majority of windows pass the VSC check. Please refer to figures below for visual representation of VSC check results.

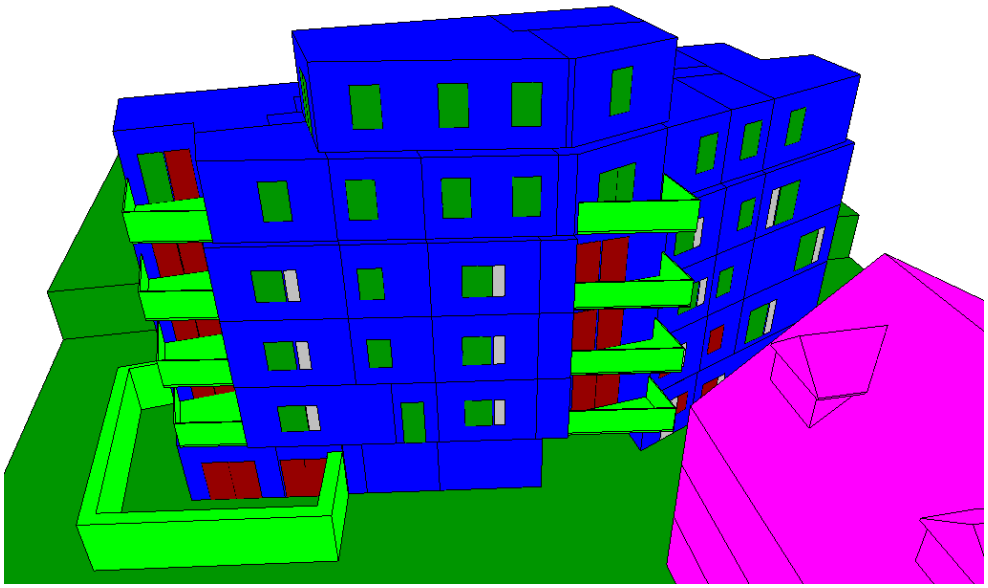

Figure 4.1: Visual representation of VSC results for the proposed building – south elevation; red areas indicate a failing window (extracted from IES Radiance)

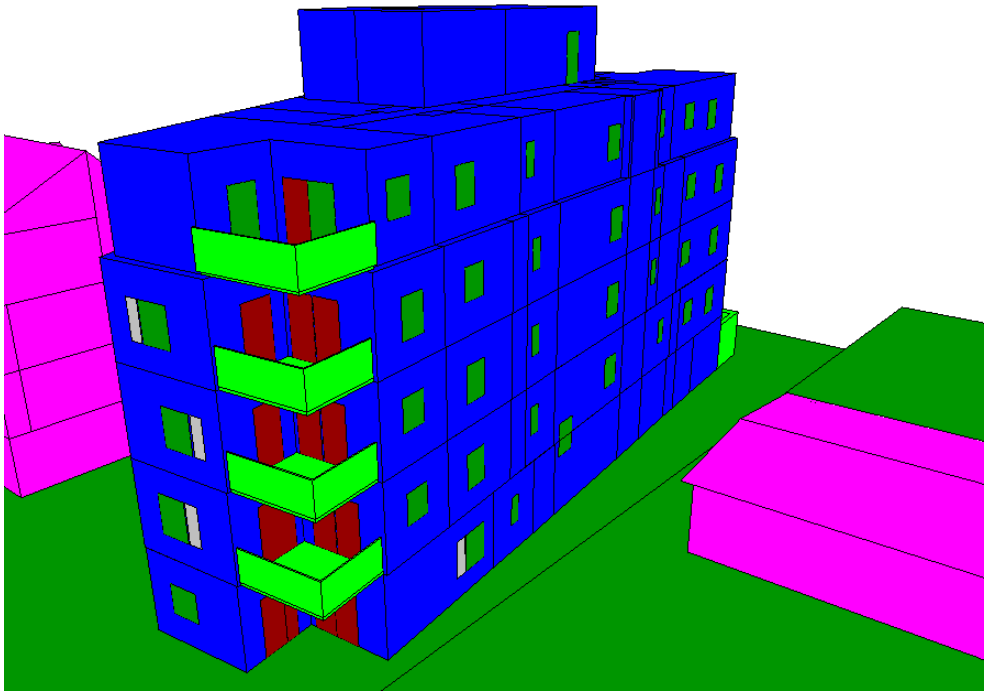

Figure 4.2: Visual representation of VSC results for the proposed building – north and east elevation; red areas indicate a failing window (extracted from IES Radiance)

TOTAL NUMBER OF WINDOWS	125		
PASS AND PASS 2	93	74.40%	81.60%
ACCEPTABLE IN DENSE DEVELOPMENTS	9	7.20%	
FAIL	23	18.40%	

Table 4.1: VSC Results for Proposed Development

4.8 The failing spaces have been further assessed for their access to daylight through the Illuminance method. Please refer to Section 6 of the report.

No Skyline:

4.9 The NSL is a part of alternative method of analysis. It is similar to VSC approach and likely VSC method, it relates to the amount of visible sky but does not consider the room use. It does take into account the size of window but does not give any quantitative or qualitative assessment of the light in the rooms, only where sky can or cannot be seen.

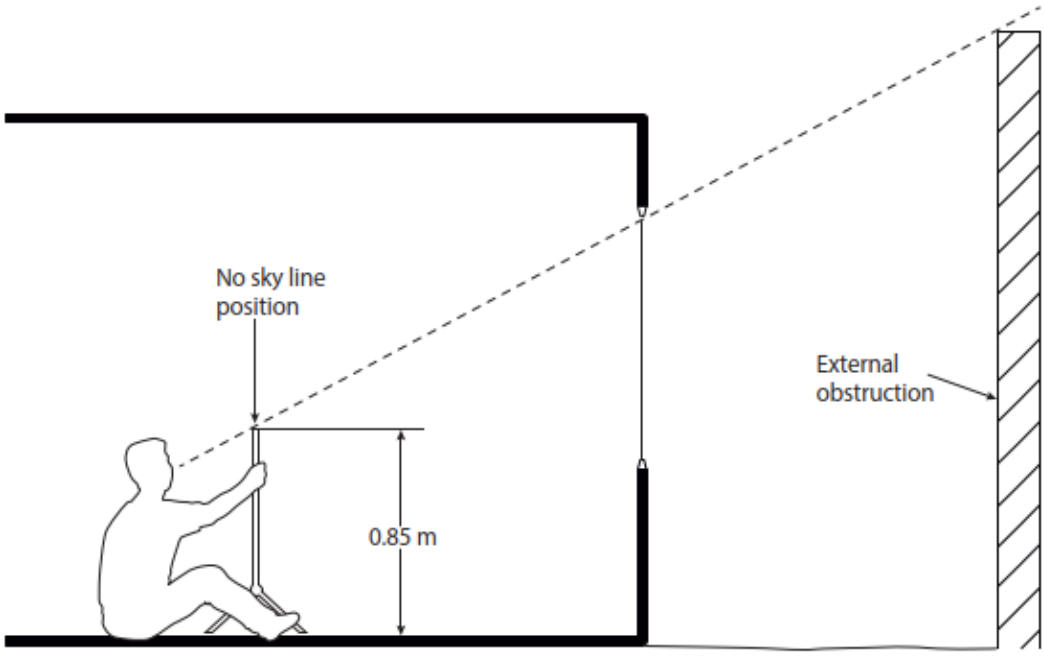

Figure 4.3: No Sky Line Position

4.10 The NSL methodology has been considered for the flats located on the lower ground floor. This will help to determine the areas where the sky is visible and where it is not. The methodology used for calculation is in line with the BRE Handbook Appendix D.

Room	Room area (m2)	Well Lit area (m2)	Well Lit (%)
Flat 01-Kitchen Living Dining	23.75	6.35	26%
Flat 01- Bedroom	12.44	5.08	40%

Table 4.2: No-Skylight Contour results by room

4.11 The additional analysis for internal daylight was carried out for the lower ground floor flat01, and the report (ref: 230711) confirms that all the habitable spaces comply with the BRE planning guidance for daylight and sunlight in new residential properties. Please refer to Appendix H for detail report.

Results of the calculations for existing dwellings

4.12 The results confirm that the majority of relevant windows pass the *'0.8 times the former value'* check, according to the BRE guidance. The only windows affected by the proposal are the windows located on the south elevation of Gloucester House School which shares common boundary with proposed building.

4.13 The results table for all assessed windows can be found in Appendix B.

4.14 Although not all windows meet the BRE standard of 27% for VSC, it is recognised that a figure above 20% should be considered reasonably good and above 15% should be deemed acceptable in urban environment.

4.15 The assessment included an evaluation of the impact on daylight for the existing buildings in relation to the proposed development.

4.16 31A Daleham Garden is a residential apartment building comprising a basement and two stories. It is situated to the south of the site. Most of the windows in this property are oriented towards the west and east, except for the narrow northern facade, which directly faces the development site.

4.17 As for 32, 32A, and 32B Daleham Garden, these are two and three storey buildings , located to the east of the site. The majority of windows in these properties are oriented towards the development site.

4.18 Gloucester House school is to the north of the site, facing on to Arkenside Road. A single storey building is located in the rear garden, close to the site boundary, with windows primarily on the south and east elevations.

4.19 These existing buildings are modelled using the layout and information available on Google Earth and Street View. A full set of window maps can be found in Appendix I.

31 A Daleham Gardens:

4.20 The results confirm that all relevant windows of 31 A Daleham Gardens pass the '0.8 times the former value' check, as per the BRE guidance. The results table for all assessed windows can be found in Appendix B.

32, 32A & 32B Daleham Gardens:

4.21 The results confirm that all relevant windows of 32, 32A and 32B Daleham Gardens pass the '0.8 times the former value' check, as per the BRE guidance. The results table for all assessed windows can be found in Appendix B.

Gloucester School:

4.22 The failing windows are mostly serving the last room in the assessed Gloucester House School. These windows existing scenario shows that the windows already receive a very minimal amount of daylight, well below the BRE recommendation. Additional analyses, such as the no skyline and illuminance check methods, need to be conducted for the failing room at Gloucester School.

4.23 The site photo shows a small room on the south end of the building. Full information for the plan and use of the building has not been obtained; however, the scale of this room suggests that it is not used as a main teaching room. The '0.8 times the former value' check is passed by the east-facing windows serving the rest of this block, and it is assumed that these spaces will not be unacceptably impacted by the proposed building.

Figure 4.4: Site Image of South facing room at Gloucester School

4.24 Since the full information for the plan and use of the room has not been obtained for Gloucester School, the dimensions of the south-facing room are 7.48m in width, as per the layout, and 2m in length (assumed).

4.25 According to the attached Appendix G, the no skyline intersects the working plane (0.85m above floor level) for a distance of 0.19m in a room with a length of 2m (assumed). Consequently, the intersection is 9.5%, which comply with the recommended value of under 20% intersection.

4.26 The south facing room at Gloucester School have been further assessed for their access to daylight using the Illuminance method. For Pre-School, the maintained illumination level is set at 300 Lux. 100% of the assessed room at Gloucester School will receive an average illuminance of 300 lux, as indicated in the image below.

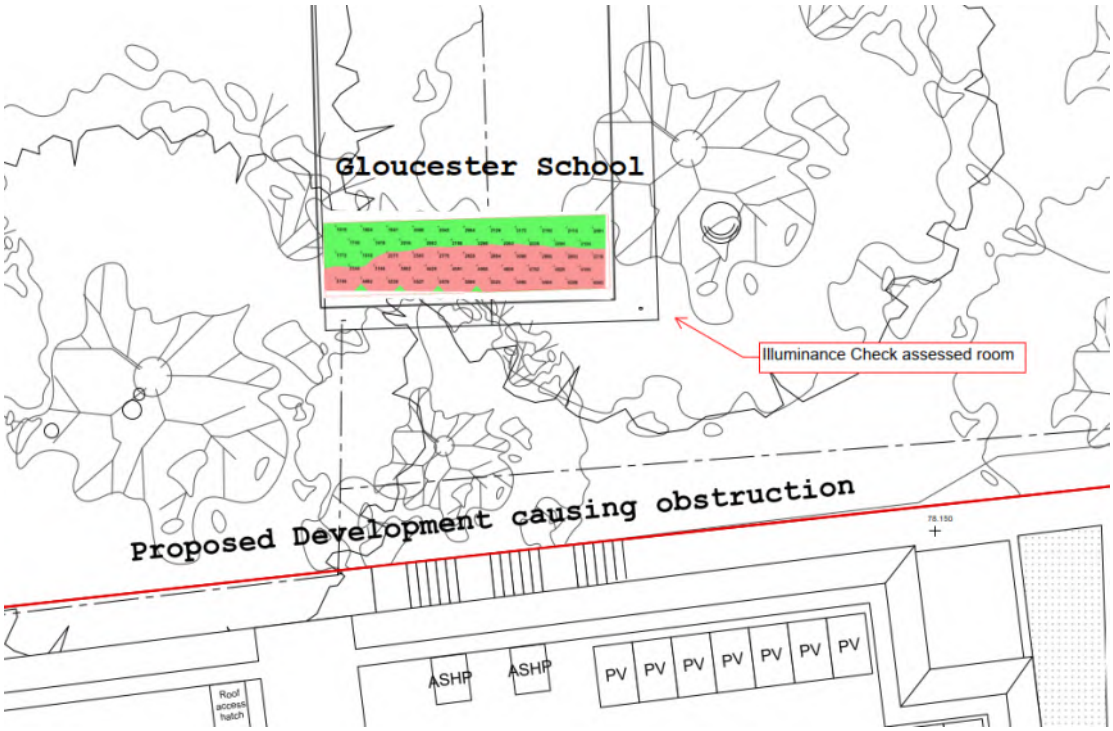

Figure 4.5: Location of Average Illuminance Assessed in a Room at Gloucester School

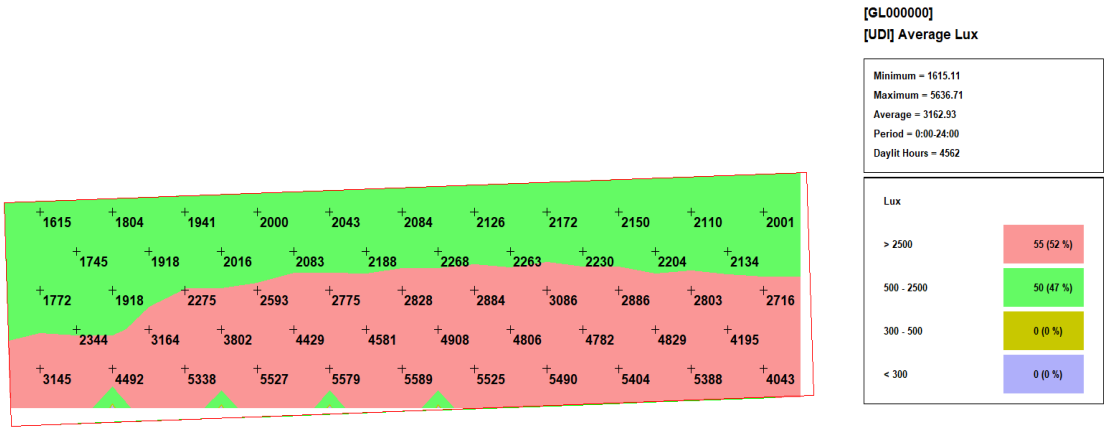

Figure 4.6: Result- Average Illuminance Check for room at Gloucester School

4.27 The only windows in the south facing elevation of Gloucester House School that will experience a loss of daylight and sunlight above the recommended 20% are those located close to the common boundary fencing. As per BRE Guide, paragraph 3.2.10 also states that:

> *"…if the existing building stands unusually close to the common boundary with the new development, or has a large balcony or overhang above the window, then a greater reduction in sunlight access may be unavoidable. The guidelines are purely advisory. "*

Number of Windows Assessed	134	
Windows with under 0.80 times its former value	118	**88%**
Windows with over 0.80 times its former value	16	**12%**

Table 4.3: Percentage of windows under 0.80 times its former value- Existing Buildings

4.28 It can be, therefore, concluded that the proposed development will have a minor impact on the neighbouring building's access to daylight and should be justifiable in areas designated for urban re-development.

5.0 ILLUMINANCE METHOD

5.1 Illuminance is a measure of the amount of light falling on a surface, usually measured in lux.

5.2 Illuminance method involves using climatic data for the location of the site to calculate the illuminance from daylight at each point on an assessment grid on the reference plane at an at least hourly interval for a typical year.

5.3 For compliance with the BRE standard (and BS EN 17037) a daylight space should achieve the minimum level of recommendation. This is shown in the table 5.1 below.

Level of recommendation	Target illuminance Et (lx) for 50% of assessment grid	Target illuminance Et (lx) for 95% of assessment grid
Minimum	300	100
Medium	500	300
High	750	500

Table 5.1: Illuminance targets

5.4 Additionally, according to the UK National Annex, the illuminance recommendations for daylight provision in UK dwellings is as below:

Room type	Target illuminance Et (lx) for 50% of assessment grid
Bedroom	100
Living room	150
Kitchen	200

Table 5.2: Illuminance targets for UK dwellings according to UK National Annex

5.5 Where the room is designed to serve as kitchen, dining and living area, the higher kitchen target might be difficult to achieve due to the room's depth. In such circumstances the recommended illuminance value for living rooms would be more appropriate, as it usually is the predominant space use.

5.6 The Illuminance method assessment is an additional daylight check for new dwellings. It has been carried out for those rooms that failed the VSC check (see section 4).

5.7 The surface reflectance values assumed for the purpose of the illuminance calculations are based on the values suggested in the BRE guide.

5.8 The results of the illuminance method check confirm that all assessed rooms meet the recommended daylight levels (lux) as shown in below table. Please refer to Appendix C for the results of the calculations.

Room type	Target illuminance	Percentage of room area receiving Average illuminance above Target lux
	Et (lx) for 50% of assessment grid	(%)
Flat 02 Kitchen Living Dining	200	71%
Flat 05 Kitchen Living Dining	200	100%
Flat 06 Kitchen Living Dining	200	100%
Flat 11 Kitchen Living Dining	200	100%
Flat 04 Kitchen Living Dining	200	50%
Flat 07 Kitchen Living Dining	200	63%
Flat 10 Kitchen Living Dining	200	81%
Flat 02 Bedroom	100	100%

Table 5.3: Illuminance Check for the rooms failing VSC

6.0 SUNLIGHT ANALYSIS

6.1 Sunlight is direct light from the sun, as opposed to diffused light which is measured through the daylight factor method.

Access to Sunlight (APSH)

6.2 The BRE guidance requires that access to sunlight be considered and that sunlight availability be maximised without overheating the space. The guidance recommends that where practical, at least one window to a main living room faces within 90 degrees of south and should receive at least 25% of annual probable sunlight hours including at least 5% of Annual Probable Sunlight Hours (ASPH) between 21st September and 21st March, where possible.

6.3 Consequently, to assess the loss of sunlight to an existing building, it is recommended that **all main living rooms** of dwellings should be checked **if they have a window facing within 90 degrees of due south.** The BRE guidance states that the check for those windows should meet the following criteria:

- Receive at least 25% of APSH, including at least 5% of APSH in winter months between September 21st and March 21st; failing this, the openings should:
- Receive at least 80% of its former sunlight hours both annually and during the winter months and;
- Have a reduction in sunlight received over the whole year of less than 4% of APSH.

6.4 If the above criteria are met, the change in the sunlight levels received by the existing building will not be adversely affected.

6.5 The IES VE SunCast module has been used to calculate the annual probable sunlight hours (APSH) for the existing site and the proposed development.

6.6 The analysis of the site location plan confirms that the windows located in the following buildings should be assessed for level of sunlight received:

- 31 Daleham Gardens – living rooms on south and west elevations facing the courtyard; the use of all spaces has not been identified; all windows on south elevation and living rooms on west elevation have been assessed.
- Gloucester House School – south facing windows facing the proposed building – space use unknown, therefore all windows have been assessed.
- 31A Daleham Gardens – north facing windows facing the proposed building – all windows have been assessed.
- 32, 32A and 32B Daleham Gardens- east facing windows facing the proposed building - all windows have been assessed

Results for the Proposed Development

6.7 The results show that all windows in kitchen/living rooms orientated within 90 degrees due south pass the above criteria. Detailed results of APSH calculations for the identified windows are shown in Appendix D.

6.8 The results show that 56% of the assessed windows in the proposed development meet the sunlight criteria, with 44% failing to meet them for either annual or winter sunlight hours.

6.9 To determine whether an adequate amount of sunlight is achieved within a room, the following criteria need to be met. At least one main window wall should face within 90° of due south. Additionally, at least one window should receive a minimum of 25% of annual probable sunlight hours, including at least 5% during the winter months between September 21st and March 21st. The windows identified as failing are in living rooms that also have a south-facing window meeting the criteria. Therefore, the rooms should be receiving an adequate amount of sunlight. With this information, it can be concluded that the proposed development receives an adequate amount of sunlight.

6.10 The worst affected windows are those located on north and east elevation of proposed building, please refer to the image below for the results and location of the failing windows.

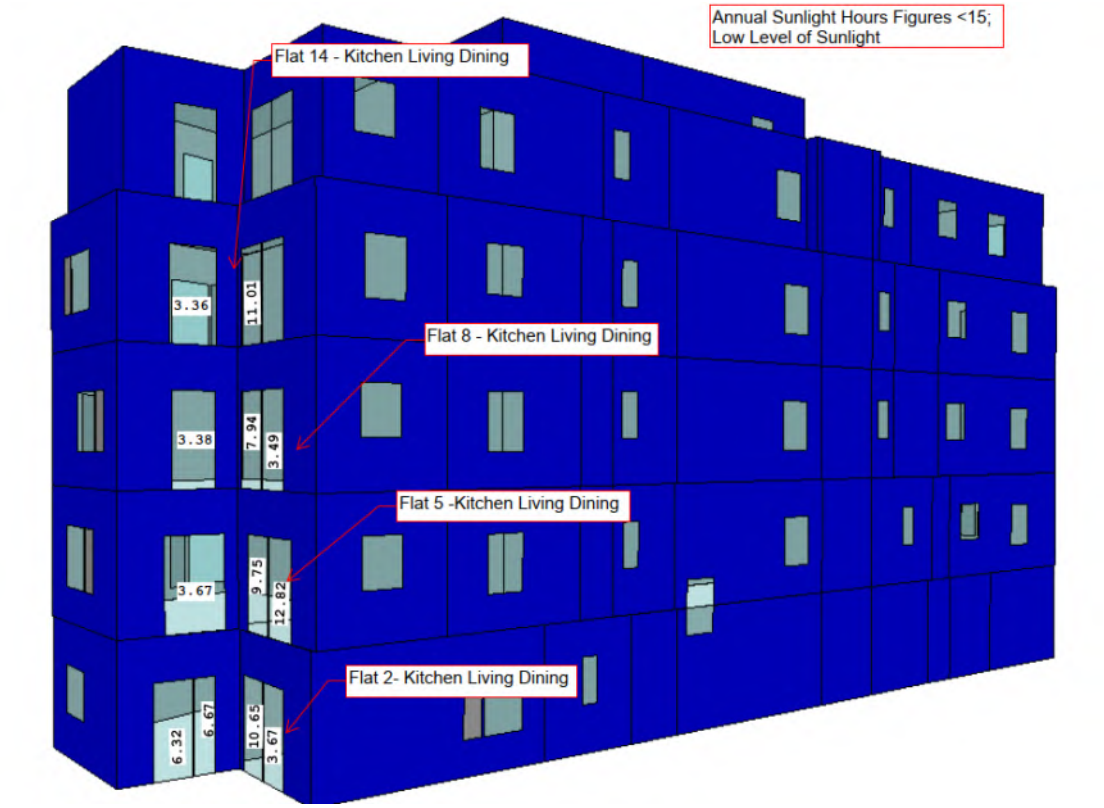

Figure 6.1: Results – Annual Sunlight Hours figures <15 – Proposed Development

Total assessed within 90 degrees of due south	125		
Pass Annual	66	52.80%	56.80%
Marginal Fail- Pass2 Annual	5	4.00%	
Fail Annual	54	43.20%	
Pass Winter	70	56.00%	56.00%
Marginal Fail- Pass2 Winter	0	0.00%	
Fail Winter	55	44.00%	

Table 6.1: Results APSH- Proposed Development

Results for Neighbouring Buildings

31 A Daleham Gardens:

6.11 The results confirm that all relevant windows of 31 A Daleham Gardens pass the '0.8 times the former value' check, as per the BRE guidance. The results table for all assessed windows can be found in Appendix E.

32, 32A & 32B Daleham Gardens:

6.12 The results confirm that all relevant windows of 32, 32A and 32B Daleham Gardens pass the '0.8 times the former value' check, as per the BRE guidance. The results table for all assessed windows can be found in Appendix E.

Gloucester School:

6.13 The results of the modelling confirm that the majority of relevant windows in the neighbouring buildings pass the annual and winter sunlight hours criteria. The only windows that miss the recommended targets and were identified to be located in Gloucester House School. Because these windows are close to the common boundary fencing between the Gloucester House School and the proposed building, they already receive a low level of sunlight, and it has been determined that the occupants of this room will not notice the loss of sunlight.

Total Number of Windows:	142	
Windows with under 0.80 times its former value:	89%	126
Windows with over 0.80 times its former value:	11%	16

Table 6.2: Results APSH- Existing Development

6.14 It is also recognised that a certain level of flexibility in assessing the level of daylight and sunlight is required for areas of re-development, particularly in dense urban environments. The calculations presented in this report are based on the BRE guide, which stresses that the recommended threshold values are only advisory and should not restrict development.

6.15 For this reason, it can be concluded that the proposed development will not negatively impact the neighbouring buildings' access to sunlight.

Over-shading of Gardens and Open Spaces

6.16 According to the BRE guide, the availability of sunlight should also be checked for all open spaces "where it will be required". It suggests that assessments should include:

- Main, back gardens of a house;
- Parks and playing fields;
- Sitting out areas, such as those in public squares;
- Other areas e.g., children's playgrounds, paddling pools, fountains etc.

6.17 Following the above recommendations and the review of the outdoor spaces surrounding the proposed development and the adjacent plots, it has been concluded that the only relevant outdoor space in close vicinity of the proposed development is the internal courtyard of the Gloucester House School building located to the north of the proposal.

6.18 The BRE guide further recommends that *"as a check (…) at least half of the amenity areas listed above should receive at least two hours of sunlight on 21 March."*

6.19 The Gloucester School amenity area was closely assessed, and it has been confirmed that the amenity area will not be affected as it complies with the BRE guide.

Figure 6.2: Gloucester School Amenity area

6.20 Based on the hourly images for the spring equinox, it is clear that the shade created by the proposed development does not affect the assessed area. Please refer to Appendix F for the shading images

7.0 CONCLUSION

7.1 This assessment has been undertaken following the guidance given in the Building Research Establishment's (BRE) Publication 'Site Layout Planning for Daylight and Sunlight'.

7.2 The assessment finds that the majority of relevant spaces in the proposed development meet the recommended values for VSC and APSH. Where the target values are not met, illuminance calculations have been carried out. The results demonstrate that the proposal will allow all new flats to receive an adequate level of daylight and sunlight.

7.3 The assessment also confirms that the majority of the existing neighbouring buildings 31A, 32, 32A and 32B Daleham Gardens will not be affected by the proposed development. All of the VSC and APSH values will not be reduced below the recommended 80% of their former, pre-development value as recommended by the BRE.

7.4 The only windows that will experience a loss of daylight and sunlight above the recommended 20% are those located in the south facing elevation of Gloucester House School. The Gloucester House School and proposed building share common boundary fencing with the proposed building, As per the BRE guidelines *"…if the existing building stands unusually close to the common boundary with the new development, or has a large balcony or overhang above the window, then a greater reduction in sunlight access may be unavoidable. The guidelines are purely advisory ".* These windows, however, already experience a very low level of daylight and sunlight, therefore is has been concluded that the loss of daylight and sunlight will not be noticeable by the occupants of this room. Additional analysis, including a No Skyline and Illuminance check, was carried out for the failing room at Gloucester School. The illuminance check results confirm that 100% of the room area will receive an average of 300 lux.

7.5 The neighbouring amenity areas have been assessed to determine the level of sunlight received by the external spaces. It has been found that areas of relevance will not be affected by the proposed development.

7.6 It is concluded that the proposed development will have a minimal impact on the neighbouring buildings.

8.0 DISCLAIMER

8.1 Create Consulting Engineers Ltd disclaims any responsibility to the Client, Mole Architects Ltd and others in respect of any matters outside the scope of this report.

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8.3 Create Consulting Engineers Ltd accepts no responsibility whatsoever to other parties to whom this report, or any part thereof, is made known. Any such other parties rely upon the report at their own risk.

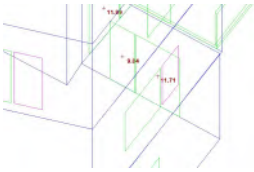
APPENDICES

APPENDIX A

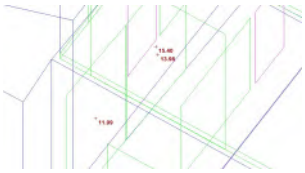
VSC - PROPOSED DEVELOPMENT

	Zone	Surface	Opening	V.S.C	Status
1	BT000000	2	0	27.4	Pass
2	FL000002	3	1	20.16	Pass2
3	FL000003	6	0	11.71	Fail
4	FL000003	6	1	9.04	Fail
5	FL000003	7	0	38.54	Pass
6	FL000003	8	1	23.19	Pass2
7	FL000003	8	2	32.39	Pass
8	FL000004	2	0	15.4	Fail
9	FL000004	2	1	11.99	Fail
10	FL000004	3	0	27.19	Pass
11	BT000004	4	0	37.3	Pass
12	FL00000A	4	0	37.42	Pass
13	FL00000B	2	0	26.65	Pass2
14	FL00000C	5	0	38.36	Pass
15	FL00000C	6	0	18.44	Marginal Fail
16	FL00000C	6	1	14.32	Fail
17	FL00000C	7	0	13.98	Fail
18	FL00000C	8	0	39.65	Pass
19	FL00000C	9	0	30.39	Pass
20	FL00000D	2	1	39.86	Pass
21	FL00000D	3	0	16.13	Fail
22	FL00000D	3	1	11.71	Fail
23	FL00000D	10	0	39.33	Pass
24	FL00000D	10	1	39.28	Pass
25	FL00000E	2	0	19.49	Marginal Fail
26	FL00000E	3	1	38.65	Pass
27	RM000002	4	0	39.37	Pass
28	BT000006	2	0	39.41	Pass
29	FL000013	5	0	31.16	Pass
30	FL000014	2	0	39.46	Pass
31	FL000015	2	0	39.32	Pass
32	FL000015	3	0	16.98	Marginal Fail
33	FL000015	3	1	13.07	Fail
34	FL000015	4	0	14.36	Fail
35	FL000015	5	1	39.46	Pass
36	FL000015	6	0	35.96	Pass
37	FL000020	2	0	33.92	Pass
38	FL000020	3	0	39.69	Pass
39	FL000021	4	0	39.63	Pass
40	FL000022	5	0	39.49	Pass
41	FL000022	5	1	39.63	Pass
42	FL000023	3	0	35.99	Pass
43	FL000023	3	1	33.49	Pass
44	FL000024	4	0	39.41	Pass
45	FL000025	4	0	39.47	Pass
46	BT00000C	4	0	39.6	Pass
47	FL000027	2	0	39.42	Pass
48	FL000027	3	0	31.59	Pass
49	FL000027	3	1	26.12	Pass2
50	FL000027	4	0	28.49	Pass
51	FL000027	6	0	39.56	Pass
52	FL000029	3	0	39.63	Pass
53	CR000000	2	0	32.23	Pass
54	CR000002	4	0	37.81	Pass
55	CR000002	4	1	34.47	Pass
56	CR000003	4	0	39.35	Pass
57	CR000005	4	0	38.37	Pass
58	SP000004	9	0	25.31	Pass2
59	SP000004	9	1	24.65	Pass2
60	SP000004	9	2	21.94	Pass2
61	SP000004	9	3	23.17	Pass2
62	SP000004	10	0	26	Pass2
63	SP000004	10	1	26.13	Pass2
64	SP000003	6	0	24.41	Pass2
65	SP000003	6	1	19.14	Marginal Fail
66	SP000008	2	0	1.56	Fail
67	SP000008	2	1	1.44	Fail
68	SP00000A	4	0	21.49	Pass2
69	SP00000B	4	0	14.32	Fail
70	SP00000B	4	1	13.67	Fail
71	SP00000E	5	0	35.38	Pass
72	SP000014	7	0	38.74	Pass
73	SP000013	4	0	36.33	Pass
74	SP000017	8	0	15.33	Fail
75	SP000017	8	1	11.21	Fail
76	SP000017	9	0	39.63	Pass
77	SP000017	10	0	38.84	Pass
78	SP000017	10	1	38.8	Pass
79	SP000018	6	0	18.91	Marginal Fail
80	SP000018	7	0	37.8	Pass
81	SP00001A	4	0	38.13	Pass
82	SP000021	6	1	29.21	Pass

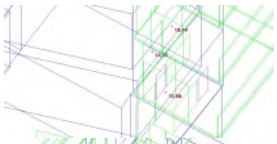
Flat 02- Kitchen Living Dining



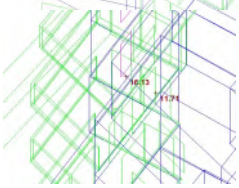
Flat 02- bedroom



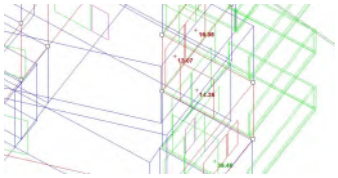
Flat 05 - kitchen living dining



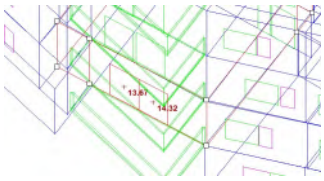
Flat 06- Kitchen living dining



flat 08- kitchen living dining



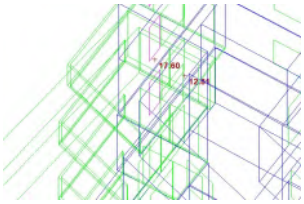
Flat 04- kithen living area



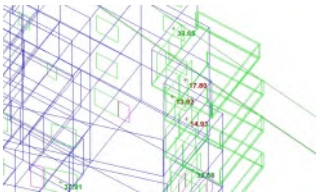
VSC - PROPOSED DEVELOPMENT

	Zone	Surface	Opening	V.S.C	Status
83	SP000022	5	0	17.21	Marginal Fail
84	SP000022	5	1	19.02	Marginal Fail
85	SP000025	2	1	37.28	Pass
86	FL000000	2	0	39.85	Pass
87	FL000000	3	0	17.6	Marginal Fail
88	FL000000	3	1	12.81	Fail
89	FL000000	10	0	39.42	Pass
90	FL000000	10	1	39.5	Pass
91	FL000001	2	0	20.91	Pass2
92	FL000001	3	1	39.2	Pass
93	RM000025	4	0	39.31	Pass
94	BT000003	2	0	39.45	Pass
95	FL000005	5	0	37.24	Pass
96	FL000006	2	0	39.54	Pass
97	FL000007	2	0	39.65	Pass
98	FL000007	3	0	17.8	Marginal Fail
99	FL000007	3	1	13.92	Fail
100	FL000007	4	0	14.93	Fail
101	FL000007	5	1	39.66	Pass
102	FL000007	6	1	37.91	Pass
103	ST000000	4	0	39.53	Pass
104	SP000026	4	0	39.08	Pass
105	SP00002D	6	1	34.44	Pass
106	SP00002F	5	0	22	Pass2
107	SP00002F	5	1	24.72	Pass2
108	SP000031	2	1	38.66	Pass
109	SP000037	5	0	38.8	Pass
110	SP000034	9	0	25.46	Pass2
111	SP000034	9	1	30.14	Pass
112	SP000034	10	0	39.97	Pass
113	SP000034	11	0	39.6	Pass
114	SP000034	11	1	39.62	Pass
115	SP000039	2	0	39.62	Pass
116	SP000039	2	1	39.74	Pass
117	SP000039	2	2	39.63	Pass
118	SP000039	3	0	39.27	Pass
119	SP000039	3	1	39.29	Pass
120	SP000039	4	0	39.39	Pass
121	SP00003A	7	0	39.52	Pass
122	SP00003B	5	0	0	Fail
123	SP00003B	5	1	0	Fail
124	1F000001	5	0	0	Fail
125	1F000001	5	1	0	Fail

Flat 09- kitchen living dining



flat 11- kitchen living dining



TOTAL NUMBER OF WINDOWS	125		81.60%
PASS AND PASS 2	93	74.40%	
ACCEPTABLE IN DENSE DEVELOPMENTS (IN ORGANGE)	9	7.20%	
FAIL	23	18.40%	

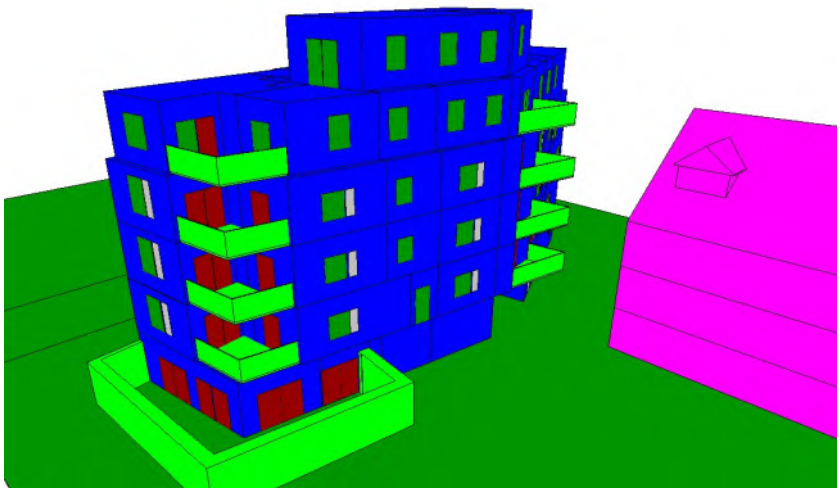


Image 01 - Southwest Elevation - Failing VSC

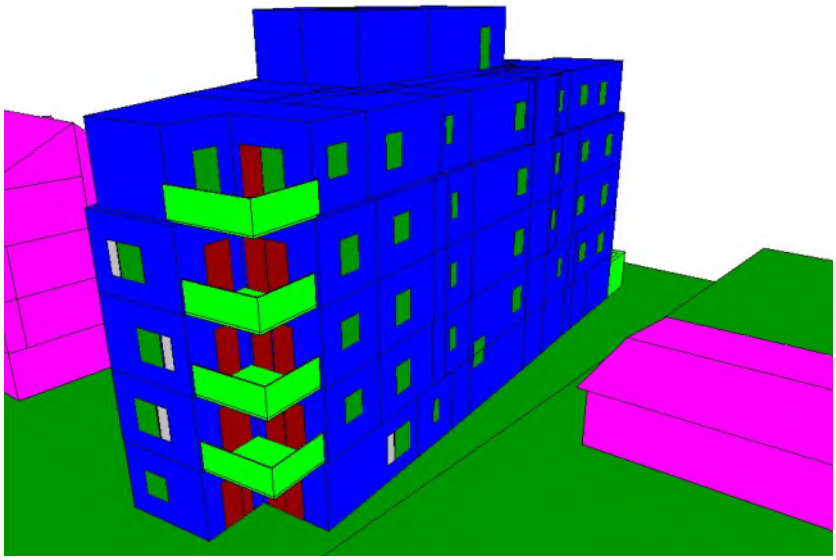


Image 02 - Northeast Elevation - Failing VSC

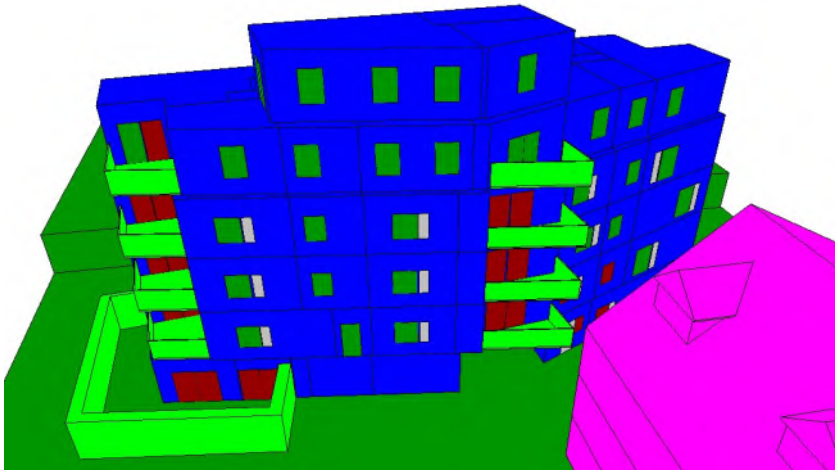


Image 02 - South Elevation - Failing VSC

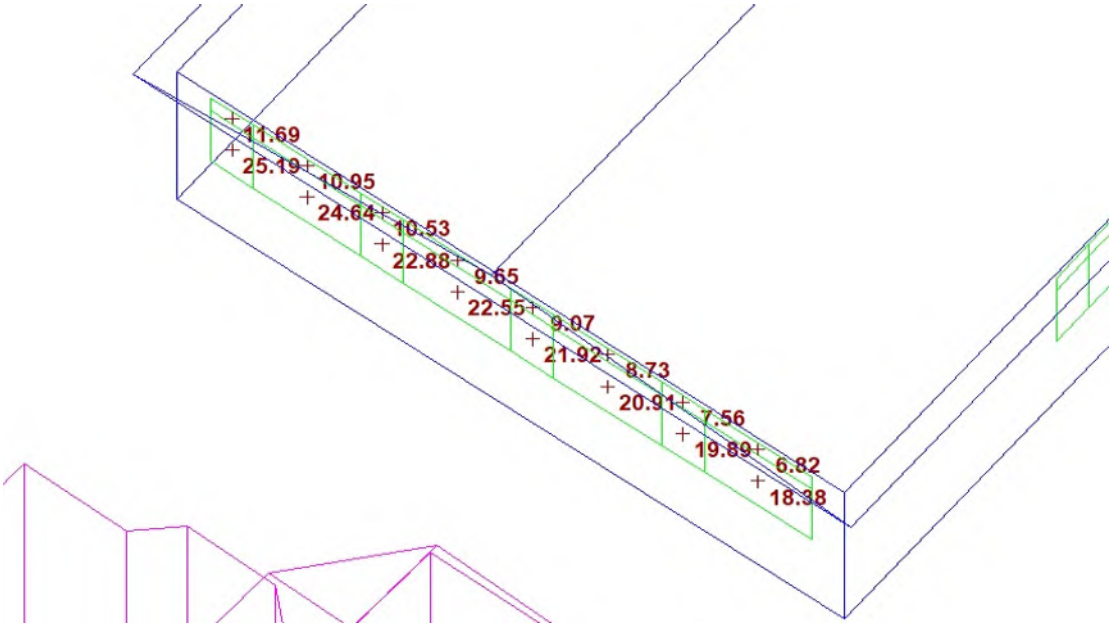
APPENDIX B

Building Name	Zone	Surface	Opening	VSC Before	VSC After	% Reduction	STATUS
1	DL000008	4	0	22.15	25.69		
2	DL000008	18	0	33.26	28.38		
3	DL000008	18	1	34.16	29.23		
4	DL000008	18	2	39.06	34.47		
5	DL000008	18	3	39.28	34.12		
6	DL000008	18	4	38.95	33.2		
7	DL000008	18	5	38.98	33.49		
8	DL000008	30	0	34	31.91		
9	DL000008	30	1	33.72	32.41		
10	DL000008	30	2	39.38	37.88		
11	DL000008	30	3	39.49	37.43		
12	DL000008	30	4	39.21	37.26		
13	DL000008	30	5	39.38	37.05		
14	DL000003	4	0	39.42	34.56		
15	DL000003	4	1	39.42	34.24		
16	DL000003	4	2	39.65	37.46		
17	DL000003	4	3	39.66	37.59		
18	DL000003	4	4	39.36	36.53		
19	DL000003	4	5	39.35	36.38		
20	DL000003	5	0	19.11	22.01		
21	DL000005	9	0	37.95	30.38		
22	DL000005	9	1	38.09	30.99		
23	DL000005	9	2	38.92	33.49		
24	DL000005	9	3	38.94	33.75		
25	DL000005	10	0	17.57	19.09		
26	GL000000	4	0	33.15	32.76		
27	GL000000	4	1	17.43	17.63		
28	GL000000	4	2	34.14	33.81		
29	GL000000	4	3	17.8	17.98		
30	GL000000	4	4	18.11	17.93		
31	GL000000	4	5	34.24	33.73		
32	GL000000	4	6	33.93	34.16		
33	GL000000	4	7	18.23	17.6		
34	GL000000	4	8	17.88	17.56		
35	GL000000	4	9	33.98	33.32		
36	GL000000	4	10	34.95	35.18		
37	GL000000	4	11	18.43	18.34		
38	GL000000	4	12	18.59	18.86		
39	GL000000	4	13	35.48	36.2		
40	GL000000	4	14	34.83	36.03		
41	GL000000	4	15	18.55	18.79		
42	GL000000	4	16	18.83	18.36		
43	GL000000	4	17	35.44	35.69		
44	GL000000	4	18	35.36	35.22		
45	GL000000	4	19	18.53	18.23		
46	GL000000	4	20	18.62	18.85		
47	GL000000	4	21	35.17	34.91		
48	GL000000	4	22	35.32	34.65		
49	GL000000	4	23	17.93	18.48		
50	GL000000	4	24	18.55	18.38		
51	GL000000	4	25	34.75	34.85		
52	GL000000	4	26	35.68	35.54		

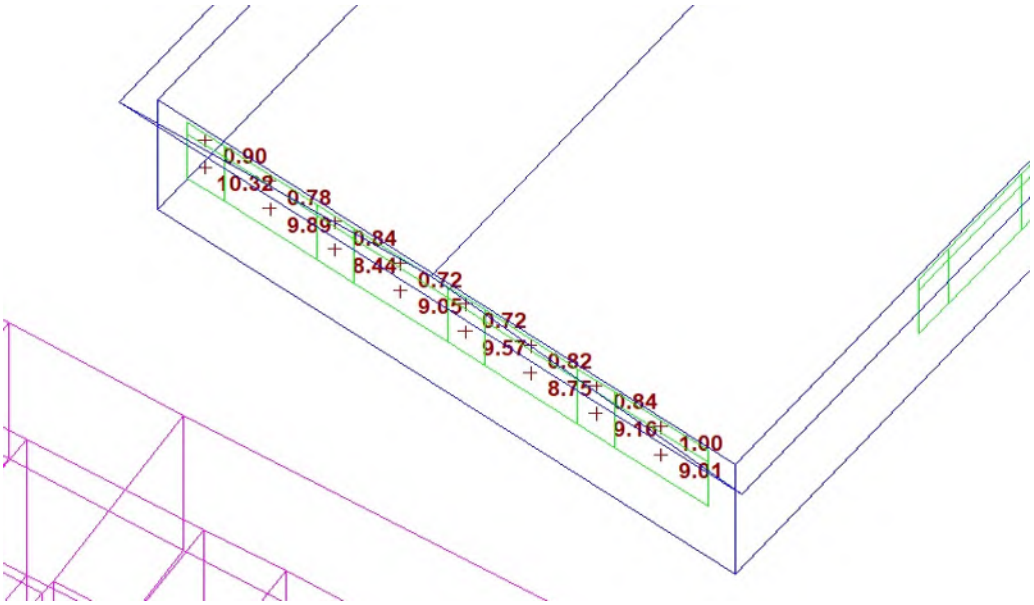
Building Name	Zone	Surface	Opening	VSC Before	VSC After	% Reduction	STATUS
53	GL000000	4	27	18.37	18.22		
54	GL000000	4	28	18.59	18.48		
55	GL000000	4	29	35.58	36.04		
56	GL000000	4	30	35.61	36.39		
57	GL000000	4	31	18.38	19.07		
58	GL000000	4	32	19.02	18.62		
59	GL000000	4	33	35.76	35.61		
60	GL000000	4	34	36.07	35.44		
61	GL000000	4	35	18.95	19.07		
62	GL000000	4	36	19.28	18.57		
63	GL000000	4	37	35.23	35.31		
64	GL000000	5	0	18.38	9.01	51.0%	South Facing Windows Gloucester School
65	GL000000	5	1	19.89	9.16	53.9%	
66	GL000000	5	2	6.82	1	85.3%	
67	GL000000	5	3	7.56	0.84	88.9%	
68	GL000000	5	4	9.07	0.72	92.1%	
69	GL000000	5	5	8.73	0.82	90.6%	
70	GL000000	5	6	21.92	9.57	56.3%	
71	GL000000	5	7	20.91	8.75	58.2%	
72	GL000000	5	8	24.64	9.89	59.9%	
73	GL000000	5	9	25.19	10.32	59.0%	
74	GL000000	5	10	10.95	0.78	92.9%	
75	GL000000	5	11	11.69	0.9	92.3%	
76	GL000000	5	12	10.53	0.84	92.0%	
77	GL000000	5	13	9.65	0.72	92.5%	
78	GL000000	5	14	22.88	8.44	63.1%	
79	GL000000	5	15	22.55	9.05	59.9%	
80	32000000	2	0	28.04	29.25		
81	32000000	2	1	32.01	33.24		
82	32000000	4	0	33.22	33.66		
83	32000000	5	0	13.74	14.14		
84	32000000	5	1	12.3	12.21		
85	32000000	6	0	27.19	27.56		
86	32000000	6	1	25.21	25.01		
87	32000004	5	0	34.43	34.39		
88	32000004	5	1	33.02	33.24		
89	32000004	5	2	32.87	33.15		
90	32000004	5	3	33.53	33.34		
91	32000004	5	4	33.45	33.16		
92	32000004	5	5	33.96	34.07		
93	32000004	5	6	33.83	33.88		
94	32000001	2	0	34.79	35.78		
95	32000001	2	1	34.74	35.76		
96	32000001	2	2	34.6	35.9		
97	32000001	2	3	35.24	36.14		
98	32000001	2	4	35.09	36.22		
99	32000001	2	5	34.99	36.28		
100	32000001	3	0	32.28	32.91		
101	32000001	3	1	34.52	35.02		
102	32000001	9	0	34.89	35.43		
103	32000001	9	1	35.12	35.82		
104	32000001	9	2	35.5	36.12		
105	32000001	9	3	35.38	35.82		

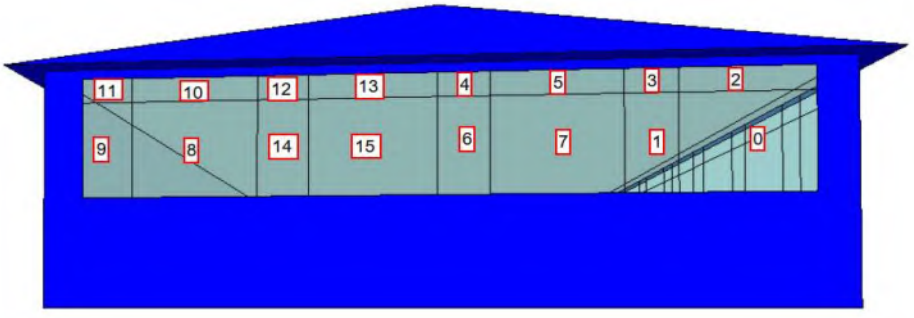
Building Name	Zone	Surface	Opening	VSC Before	VSC After	% Reduction	STATUS
106	32000007	5	0	35.74	35.99		
107	32000007	5	1	35.57	35.91		
108	32000007	5	2	36.12	36.47		
109	32000007	5	3	36.05	36.45		
110	32000007	5	4	36.28	36.55		
111	32000007	5	5	36.2	36.45		
112	32000008	5	0	34.63	34.88		
113	32000008	5	1	34.49	34.86		
114	32000008	5	2	34.86	34.95		
115	32000008	5	3	34.73	34.86		
116	32000008	5	4	35.29	35.18		
117	32000008	5	5	35.17	35.04		
118	3200000A	10	0	33.65	35.14		
119	3200000A	10	1	33.92	35.25		
120	3200000A	10	2	33.92	35.39		
121	3200000A	10	3	34.08	35.45		
122	3200000A	10	4	34.58	35.47		
123	3200000A	11	0	24.4	24.89		
124	3200000A	11	1	30.26	30.98		
125	3200000A	11	2	31.63	32.3		
126	3200000A	16	0	32.94	33.5		
127	3200000A	16	1	27.39	27.59		
128	3200000A	17	0	33.76	35.31		
129	3200000A	17	1	33.22	34.85		
130	3200000A	17	2	33.58	35.17		
131	3200000A	17	3	33.01	34.71		
132	3200000A	18	0	28.4	29.11		
133	3200000A	18	1	27.04	28.08		
134	RF000002	18	0	34.62	35.64		
Number of Windows Assessed					134		
Windows with under 0.80 times its former value					118	**88%**	
Windows with over 0.80 times its former value					16	**12%**	

Before VSC for South facing windows from Gloucester School



After VSC for South facing windows from Gloucester School



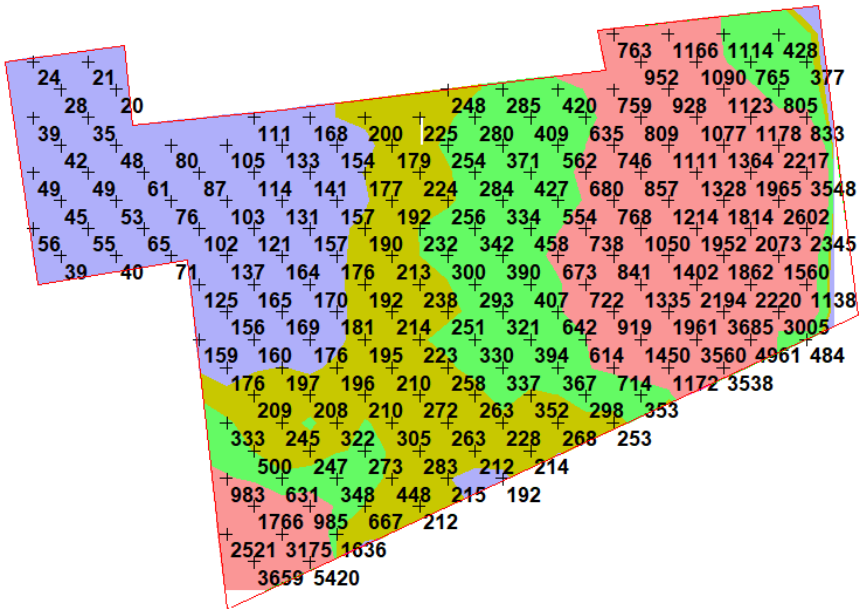


APPENDIX C

Daleham Gardens, NW3CLT

Illuminance test

Flat 2 – Kitchen living Dining

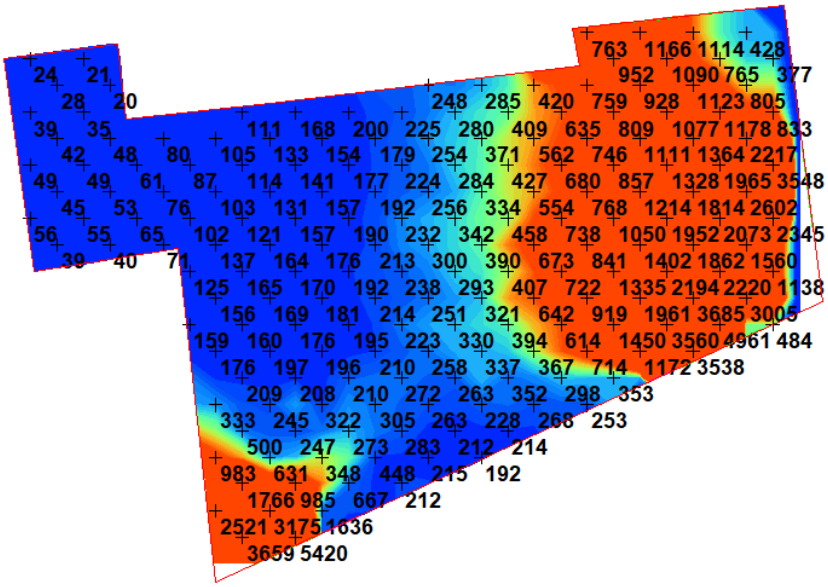


[FL000003]
[UDI] Average Lux

Minimum = 18.07
Maximum = 5420.16
Average = 691.13
Period = 0:00-24:00
Daylit Hours = 4593

Lux

> 750	107 (28 %)
300 - 750	76 (20 %)
200 - 300	79 (21 %)
< 200	109 (29 %)



[FL000003]
[UDI] Average Lux

Minimum = 18.07
Maximum = 5420.16
Average = 691.13
Period = 0:00-24:00
Daylit Hours = 4593

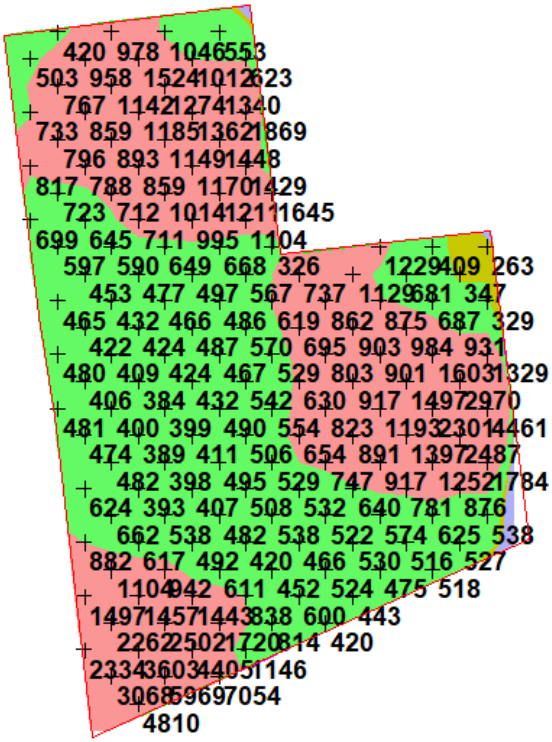
Lux Contour

728
684
640
596
552
508
464
420
376
332
288
244
200

Daleham Gardens, NW3CLT

Illuminance test

Flat 05 – Kitchen Living Dining

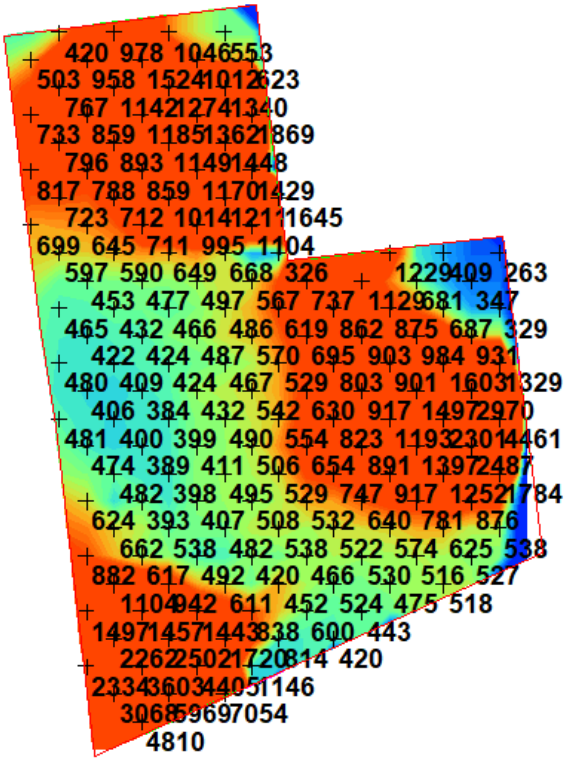


[FL00000C]
[UDI] Average Lux

Minimum = 263.84
Maximum = 7054.09
Average = 992.10
Period = 0:00-24:00
Daylit Hours = 4593

Lux

> 750	143 (44 %)
300 - 750	180 (55 %)
200 - 300	2 (0 %)
< 200	0 (0 %)



[FL00000C]
[UDI] Average Lux

Minimum = 263.84
Maximum = 7054.09
Average = 992.10
Period = 0:00-24:00
Daylit Hours = 4593

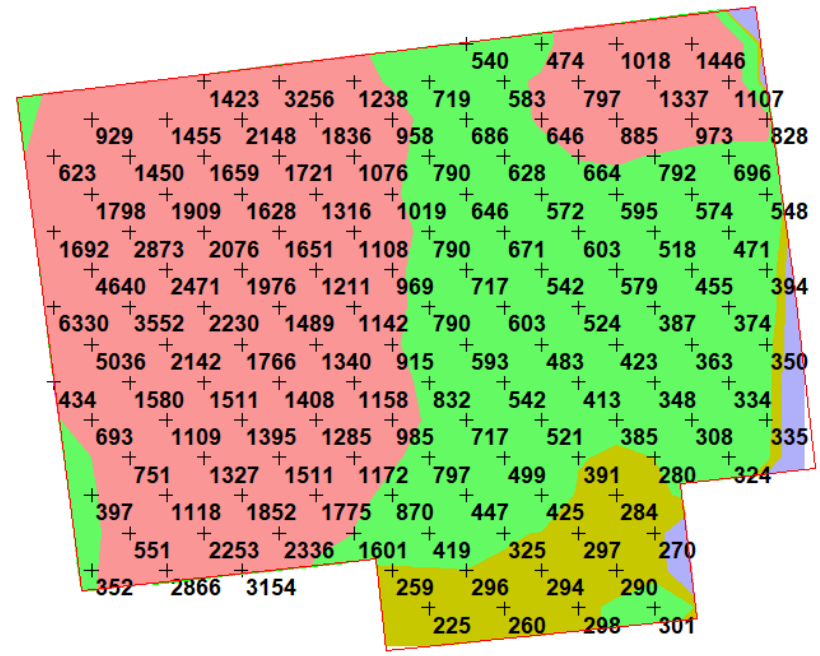
Lux Contour

728
684
640
596
552
508
464
420
376
332
288
244
200

Daleham Gardens, NW3CLT

Illuminance test

Flat 6 – Kitchen Living Dining

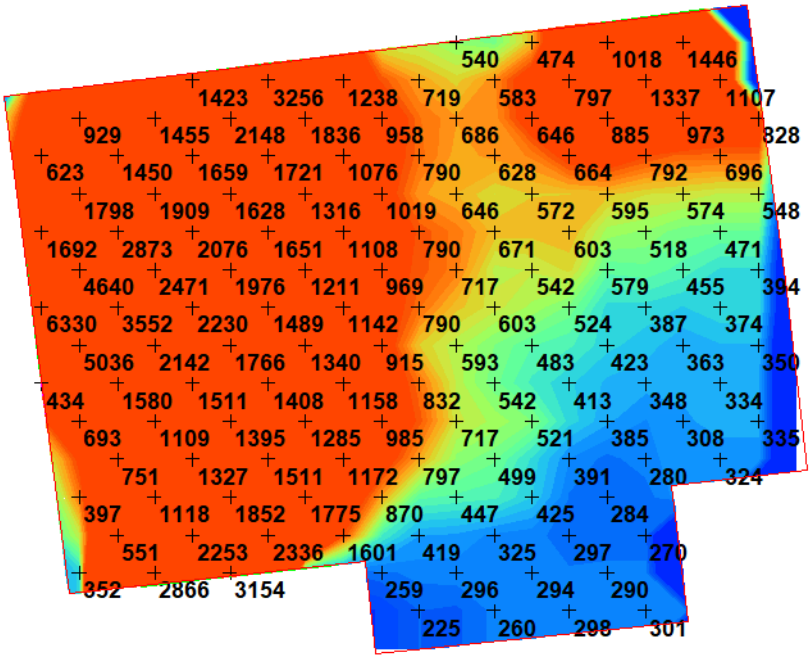


[FL00000D]
[UDI] Average Lux

Minimum = 204.92
Maximum = 6413.20
Average = 1098.66
Period = 0:00-24:00
Daylit Hours = 4593

Lux

> 750	142 (51 %)
300 - 750	113 (40 %)
200 - 300	21 (7 %)
< 200	0 (0 %)



[FL00000D]
[UDI] Average Lux

Minimum = 204.92
Maximum = 6413.20
Average = 1098.66
Period = 0:00-24:00
Daylit Hours = 4593

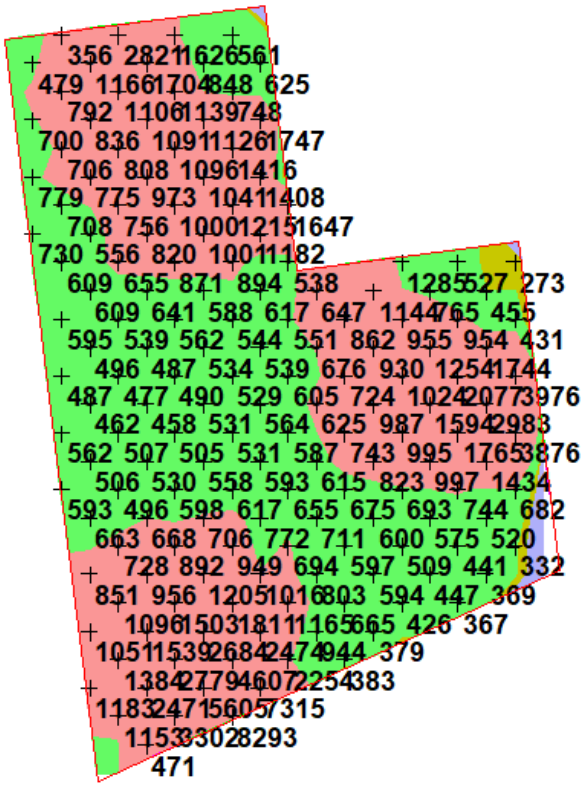
Lux Contour

728
684
640
596
552
508
464
420
376
332
288
244
200

Daleham Gardens, NW3CLT

Illuminance test

Flat 11 – Kitchen Living Dining

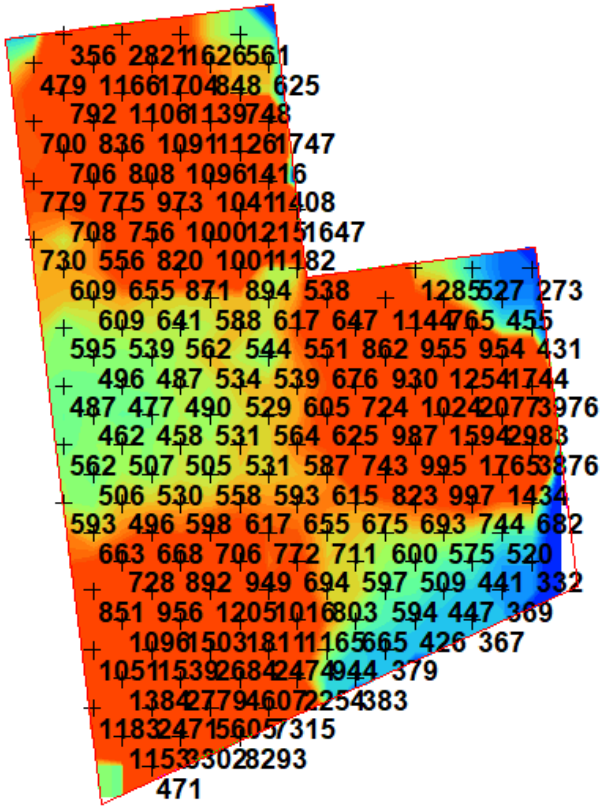


[FL000007]
[UDI] Average Lux

Minimum = 273.69
Maximum = 8293.05
Average = 1075.78
Period = 0:00-24:00
Daylit Hours = 4593

Lux

> 750	161 (49 %)
300 - 750	164 (50 %)
200 - 300	2 (0 %)
< 200	0 (0 %)



[FL000007]
[UDI] Average Lux

Minimum = 273.69
Maximum = 8293.05
Average = 1075.78
Period = 0:00-24:00
Daylit Hours = 4593

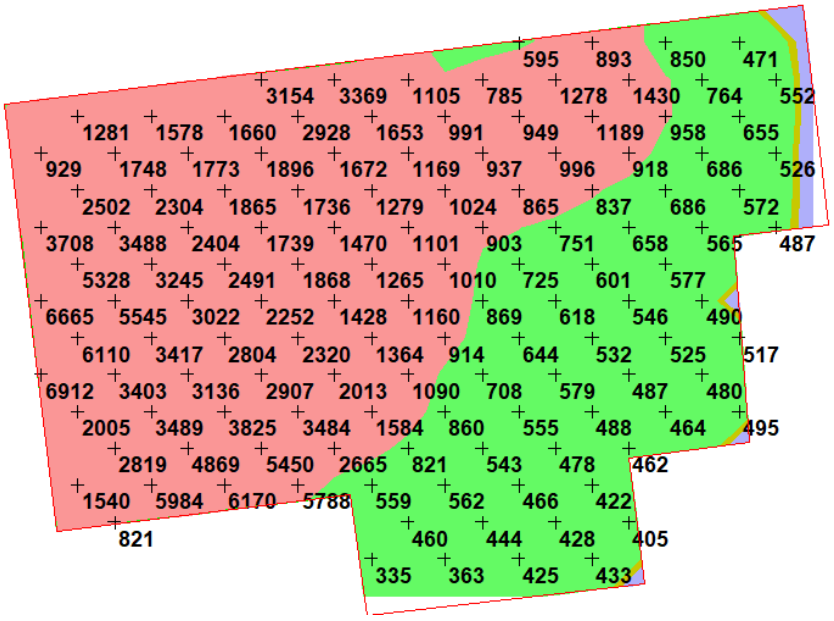
Lux Contour

728
684
640
596
552
508
464
420
376
332
288
244
200

Daleham Gardens, NW3CLT

Illuminance test

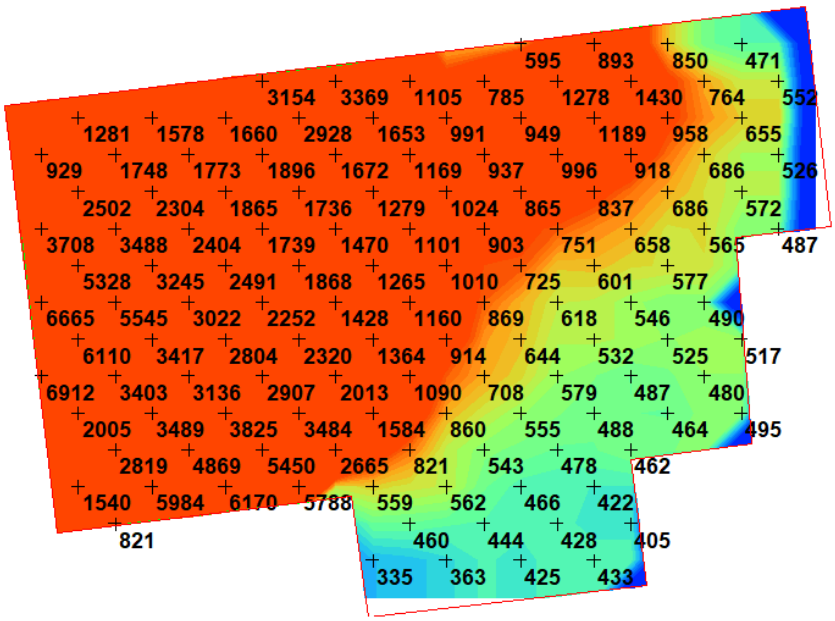
Flat 12 – Kitchen Living Dining



[SP000034]
[UDI] Average Lux

Minimum = 335.08
Maximum = 6912.65
Average = 1661.00
Period = 0:00-24:00
Daylit Hours = 4593

Lux	
> 750	167 (65 %)
300 - 750	89 (34 %)
200 - 300	0 (0 %)
< 200	0 (0 %)



[SP000034]
[UDI] Average Lux

Minimum = 335.08
Maximum = 6912.65
Average = 1661.00
Period = 0:00-24:00
Daylit Hours = 4593

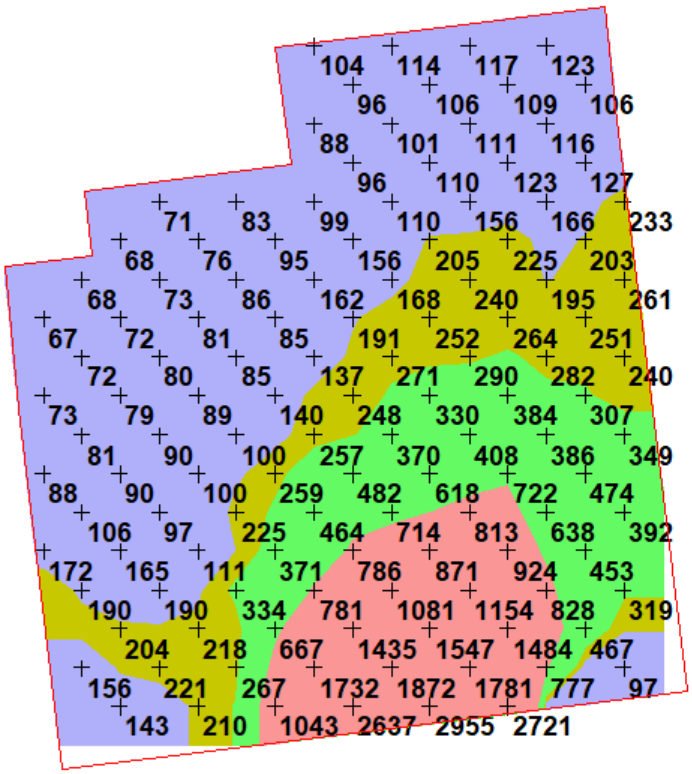
Lux Contour

728
684
640
596
552
508
464
420
376
332
288
244
200

Daleham Gardens, NW3CLT

Illuminance test

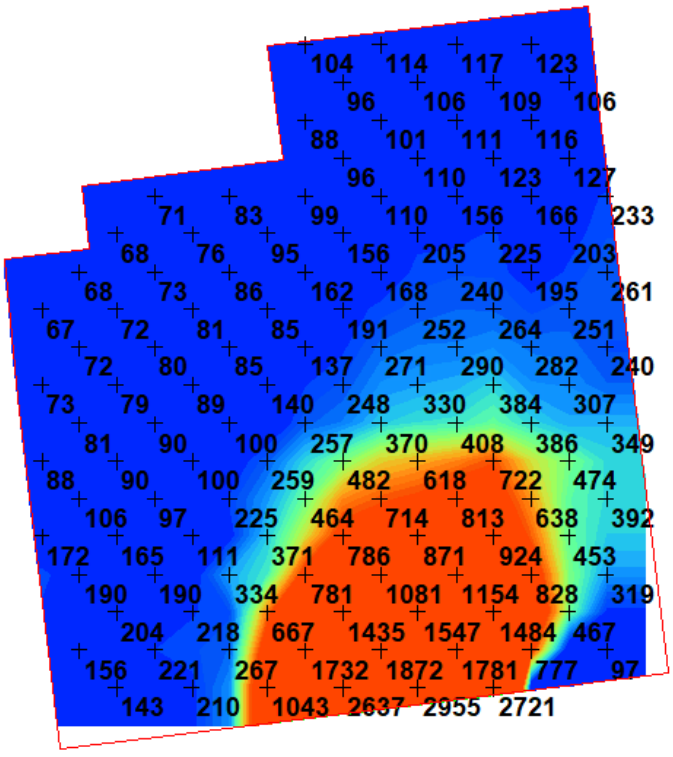
Flat 04 – Kitchen Living Dining



[SP00000B]
[UDI] Average Lux

Minimum = 64.84
Maximum = 2984.03
Average = 393.78
Period = 0:00-24:00
Daylit Hours = 4593

Lux	
> 750	36 (14 %)
300 - 750	43 (17 %)
200 - 300	44 (17 %)
< 200	124 (50 %)



[SP00000B]
[UDI] Average Lux

Minimum = 64.84
Maximum = 2984.03
Average = 393.78
Period = 0:00-24:00
Daylit Hours = 4593

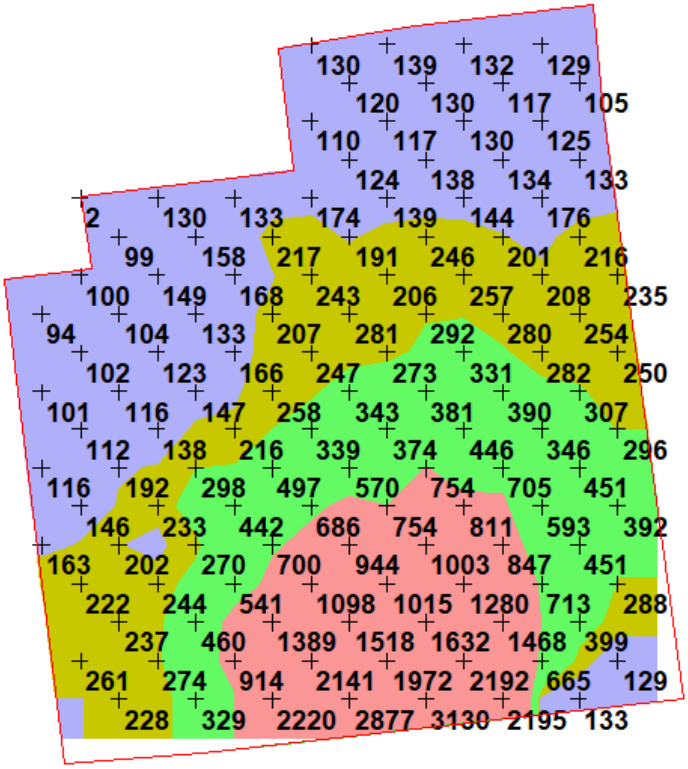
Lux Contour

728
684
640
596
552
508
464
420
376
332
288
244
200

Daleham Gardens, NW3CLT

Illuminance test

Flat 07 – Kitchen Living Dining

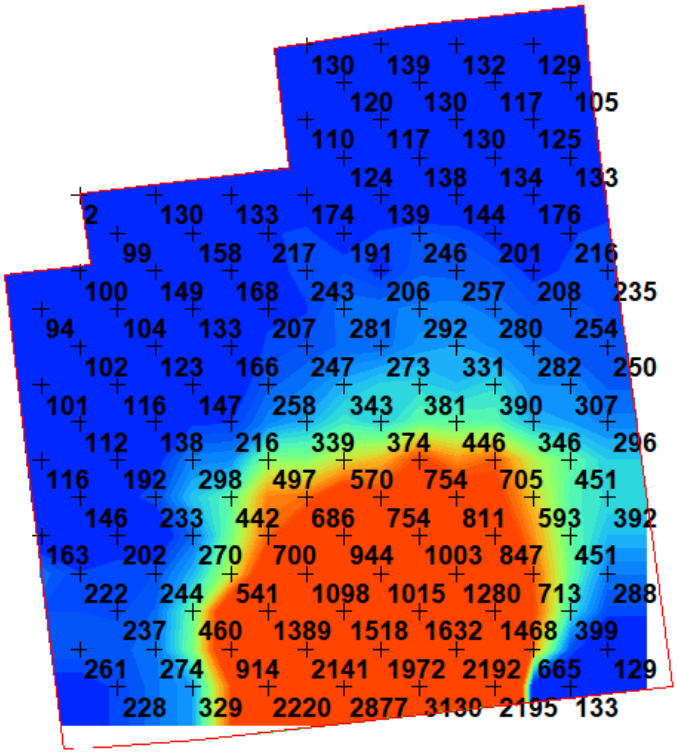


[SP000022]
[UDI] Average Lux

Minimum = 2.29
Maximum = 3130.55
Average = 460.54
Period = 0:00-24:00
Daylit Hours = 4593

Lux

> 750	42 (16 %)
300 - 750	51 (20 %)
200 - 300	63 (25 %)
< 200	93 (37 %)



[SP000022]
[UDI] Average Lux

Minimum = 2.29
Maximum = 3130.55
Average = 460.54
Period = 0:00-24:00
Daylit Hours = 4593

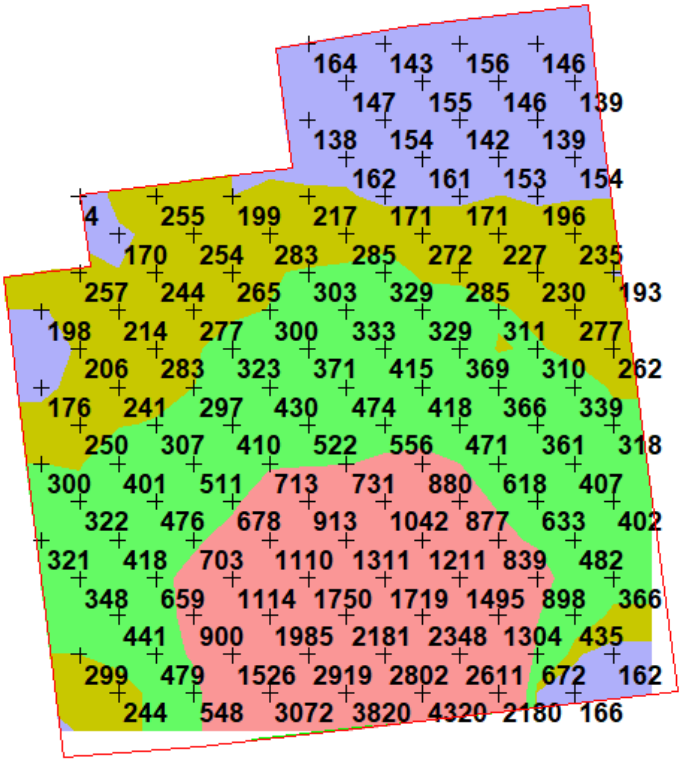
Lux Contour

728
684
640
596
552
508
464
420
376
332
288
244
200

Daleham Gardens, NW3CLT

Illuminance test

Flat 10 – kitchen living dining

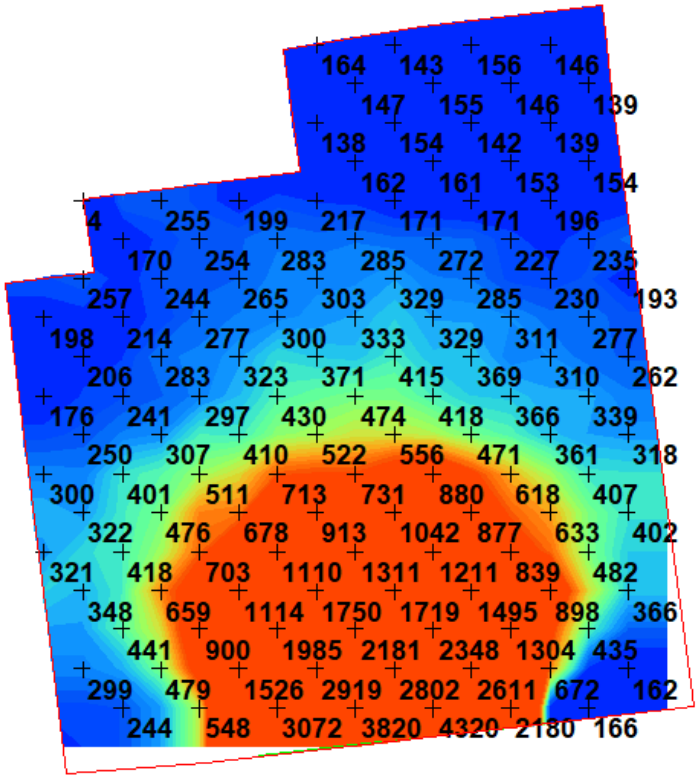


[SP00002F]
[UDI] Average Lux

Minimum = 4.05
Maximum = 4320.19
Average = 626.62
Period = 0:00-24:00
Daylit Hours = 4593

Lux

> 750	53 (21 %)
300 - 750	87 (34 %)
200 - 300	61 (24 %)
< 200	48 (19 %)



[SP00002F]
[UDI] Average Lux

Minimum = 4.05
Maximum = 4320.19
Average = 626.62
Period = 0:00-24:00
Daylit Hours = 4593

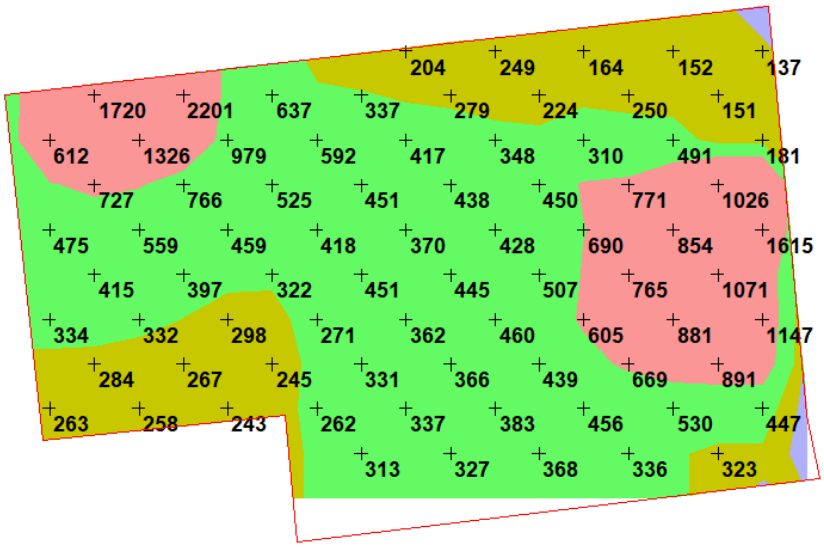
Lux Contour

728
684
640
596
552
508
464
420
376
332
288
244
200

Daleham Gardens, NW3CLT

Illuminance test

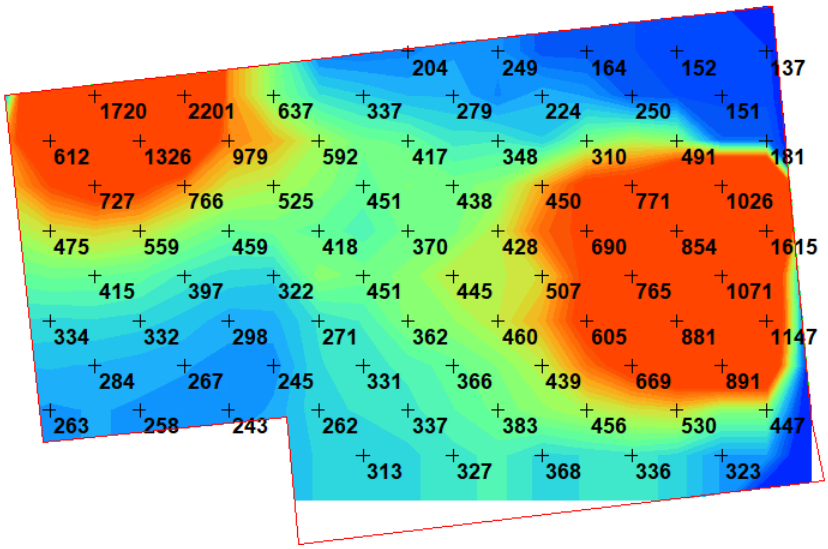
Flat 02 – Bedroom



[FL000004]
[UDI] Average Lux

Minimum = 137.01
Maximum = 2285.07
Average = 517.60
Period = 0:00-24:00
Daylit Hours = 4593

Lux	
> 750	28 (17 %)
300 - 750	90 (57 %)
100 - 300	38 (24 %)
< 100	0 (0 %)



[FL000004]
[UDI] Average Lux

Minimum = 137.01
Maximum = 2285.07
Average = 517.60
Period = 0:00-24:00
Daylit Hours = 4593

Lux Contour

724
672
620
568
516
464
412
360
308
256
204
152
100

APPENDIX D

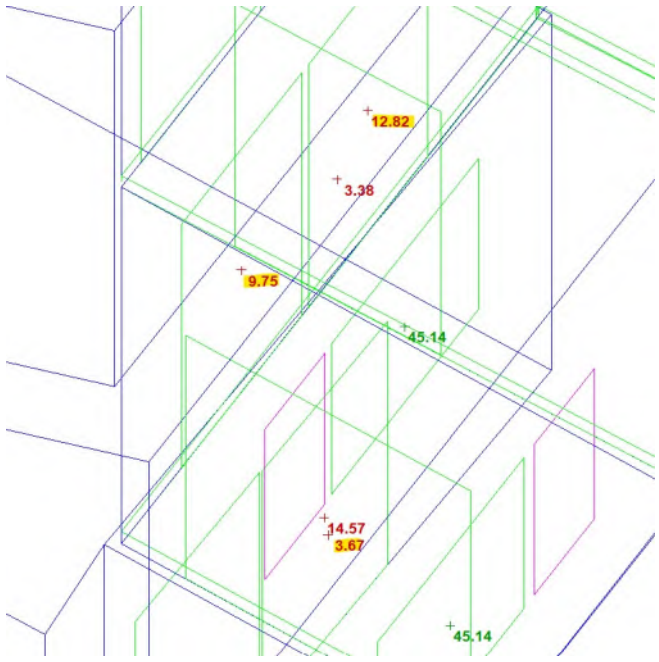
Opening	Zone	Surface	Area	Azimuth	Azimuth	Annual	Winter	Annual Pass	Winter Pass	Location Description
1	BT000000	2	0.5	353.66	90	11.84	0	Fail	Fail	
2	FL000002	3	0.68	154.98	90	45.04	14.78	Pass	Pass	
3	FL000003	6	1.89	353.88	90	6.32	0	Fail	Fail	
4	FL000003	6	1.05	353.88	90	6.67	0	Fail	Fail	Flat 02- Kitchen Living Dining
5	FL000003	7	1.21	82.69	90	45.14	16.67	Pass	Pass	
6	FL000003	8	1.36	155.18	90	49.56	16.64	Pass	Pass	
7	FL000003	8	1.32	155.18	90	61.96	22.96	Pass	Pass	
8	FL000004	2	1.89	84.64	90	14.57	2.57	Fail	Fail	
9	FL000004	2	1.89	84.64	90	10.65	0.76	Fail	Fail	Flat 02- bedroom
10	FL000004	3	1.54	353.35	90	11.73	0	Fail	Fail	
11	BT000004	4	0.55	353.21	90	18.06	0	Fail	Fail	
12	FL00000A	4	1.3	352.5	90	16.86	0	Fail	Fail	
13	FL00000B	2	1.17	155.56	90	53.02	17	Pass	Pass	
14	FL00000C	5	1.1	352.87	90	16.66	0	Fail	Fail	
15	FL00000C	6	1.89	82.98	90	12.82	2.37	Fail	Fail	
16	FL00000C	6	1.89	82.98	90	9.75	1.34	Fail	Fail	Flat 05 - kitchen living dining
17	FL00000C	7	2.94	353.77	90	3.67	0	Fail	Fail	
18	FL00000C	8	1.54	82.87	90	45.14	16.67	Pass	Pass	
19	FL00000C	9	2.41	155.48	90	59.87	20.65	Pass	Pass	
20	FL00000D	2	2.03	262.57	90	54.86	21.53	Pass	Pass	
21	FL00000D	3	1.89	173.77	90	27.8	17.14	Pass	Pass	
22	FL00000D	3	1.89	173.77	90	23.19	15.47	Pass2	Pass	
23	FL00000D	10	1.3	352.98	90	18.06	0	Fail	Fail	
24	FL00000D	10	1.1	352.98	90	18.06	0	Fail	Fail	Flat 06- Kitchen living dining
25	FL00000E	2	2.31	262.76	90	31.04	13.9	Pass	Pass	
26	FL00000E	3	1.43	189.07	90	76.79	33.73	Pass	Pass	
27	RM000002	4	0.55	352.23	90	18.06	0	Fail	Fail	
28	BT000006	2	0.55	352.23	90	18.06	0	Fail	Fail	
29	FL000013	5	1.17	154.98	90	62.37	23.93	Pass	Pass	
30	FL000014	2	1.3	353.25	90	18.05	0	Fail	Fail	
31	FL000015	2	1.1	352.87	90	18.06	0	Fail	Fail	
32	FL000015	3	1.89	82.98	90	11.84	1.81	Fail	Fail	
33	FL000015	3	1.89	82.98	90	7.94	0.94	Fail	Fail	flat 08- kitchen living dining
34	FL000015	4	2.1	352.75	90	3.38	0	Fail	Fail	
35	FL000015	5	1.43	82.96	90	45.14	16.67	Pass	Pass	
36	FL000015	6	2.4	155.48	90	70.76	28.56	Pass	Pass	
37	FL000020	2	2.31	263.12	90	41.55	13.62	Pass	Pass	
38	FL000020	3	1.5	189.14	90	81.25	38.19	Pass	Pass	
39	FL000021	4	1.5	189.16	90	81.25	38.19	Pass	Pass	
40	FL000022	5	1.5	188.56	90	81.25	38.19	Pass	Pass	
41	FL000022	5	1.5	188.56	90	81.25	38.19	Pass	Pass	
42	FL000023	3	1.89	154.01	90	58.72	23.06	Pass	Pass	
43	FL000023	3	1.89	154.01	90	54.55	20.02	Pass	Pass	
44	FL000024	4	1.5	155.62	90	78.56	36.22	Pass	Pass	
45	FL000025	4	1.5	157.56	90	78.15	36.48	Pass	Pass	
46	BT00000C	4	0.57	353.52	90	18.06	0	Fail	Fail	
47	FL000027	2	1.1	353	90	18.05	0	Fail	Fail	
48	FL000027	3	1.89	83.09	90	20.98	1.19	Pass2	Fail	
49	FL000027	3	1.89	83.09	90	11.01	0.13	Fail	Fail	
50	FL000027	4	2.1	352.87	90	3.36	0	Fail	Fail	Flat 14 Kitchen Living Dining
51	FL000027	6	1.5	155.39	90	78.9	36.54	Pass	Pass	
52	FL000029	3	1.52	155.31	90	79.17	36.81	Pass	Pass	
53	CR000000	2	0.67	353	90	15.99	0	Fail	Fail	
54	CR000002	4	1.3	353.12	90	18.06	0	Fail	Fail	
55	CR000002	4	0.7	353.12	90	18.06	0	Fail	Fail	
56	CR000003	4	1.3	353	90	18.06	0	Fail	Fail	
57	CR000005	4	1.3	353.14	90	10.76	0	Fail	Fail	
58	SP000004	9	2.31	262.48	90	29.93	9.23	Pass	Pass	
59	SP000004	9	2.31	262.48	90	30.64	10.29	Pass	Pass	
60	SP000004	9	2.31	262.48	90	30.45	11.06	Pass	Pass	
61	SP000004	9	2.31	262.48	90	30.74	10.98	Pass	Pass	
62	SP000004	10	2.31	188.99	90	48.51	11.83	Pass	Pass	
63	SP000004	10	2.31	188.99	90	48.37	12.19	Pass	Pass	
64	SP000003	6	2.1	188.95	90	44.31	10.34	Pass	Pass	
65	SP000003	6	2.1	188.95	90	35.15	7.67	Pass	Pass	
66	SP000008	2	1.98	174.05	90	1.07	1.07	Fail	Fail	
67	SP000008	2	1.07	174.05	90	1.2	1.2	Fail	Fail	
68	SP00000A	4	1.43	155.09	90	44.71	14.9	Pass	Pass	
69	SP00000B	4	2.31	172.91	90	26.03	12.82	Pass	Pass	
70	SP00000B	4	2.31	172.91	90	21.98	9.93	Pass2	Pass	
71	SP00000E	5	1.43	188.94	90	69.69	28.03	Pass	Pass	
72	SP000014	7	0.55	352.99	90	17.36	0	Fail	Fail	
73	SP000013	4	1.89	188.56	90	70.67	28.75	Pass	Pass	
74	SP000017	8	1.89	172.87	90	27.17	16.89	Pass	Pass	
75	SP000017	8	1.89	172.87	90	21.94	15.18	Pass2	Pass	
76	SP000017	9	1.98	262.65	90	54.86	21.53	Pass	Pass	
77	SP000017	10	1.3	352.82	90	17.36	0	Fail	Fail	
78	SP000017	10	1.1	352.82	90	17.36	0	Fail	Fail	
79	SP000018	6	2.31	262.65	90	30.7	13.93	Pass	Pass	
80	SP000018	7	1.43	189.07	90	74.25	31.84	Pass	Pass	
81	SP00001A	4	1.17	189.08	90	75	31.94	Pass	Pass	
82	SP000021	6	1.43	154.94	90	55.79	21.52	Pass	Pass	
83	SP000022	5	2.31	173.52	90	24.17	12.25	Pass2	Pass	
84	SP000022	5	2.31	173.52	90	29.93	15.84	Pass	Pass	
85	SP000025	2	1.43	188.53	90	72.97	30.54	Pass	Pass	

Opening	Zone	Surface	Area	Azimuth	Azimuth	Annual	Winter	Annual Pass	Winter Pass	Location Description
86	FL000000	2	1.98	262.57	90	54.86	21.53	Pass	Pass	
87	FL000000	3	1.89	173.77	90	30.83	18.14	Pass	Pass	
88	FL000000	3	1.89	173.77	90	25.31	16.15	Pass	Pass	
89	FL000000	10	1.3	352.98	90	18.06	0	Fail	Fail	
90	FL000000	10	1.1	352.98	90	18.06	0	Fail	Fail	
91	FL000001	2	2.31	262.76	90	34.04	13.96	Pass	Pass	
92	FL000001	3	1.43	189.07	90	79.17	36.11	Pass	Pass	
93	RM000025	4	0.55	352.23	90	18.06	0	Fail	Fail	
94	BT000003	2	0.55	352.23	90	18.06	0	Fail	Fail	
95	FL000005	5	1.17	154.98	90	76.11	34.14	Pass	Pass	
96	FL000006	2	1.1	353.25	90	18.05	0	Fail	Fail	
97	FL000007	2	1.3	352.87	90	18.06	0	Fail	Fail	
98	FL000007	3	1.89	82.98	90	12.36	1.93	Fail	Fail	
99	FL000007	3	1.89	82.98	90	8.02	0.79	Fail	Fail	
100	FL000007	4	2.31	352.75	90	3.49	0	Fail	Fail	
101	FL000007	5	1.43	82.96	90	45.14	16.67	Pass	Pass	
102	FL000007	6	2.4	155.48	90	77.02	34.66	Pass	Pass	
103	ST000000	4	1.3	353	90	18.06	0	Fail	Fail	
104	SP000026	4	1.17	189.08	90	78.55	35.49	Pass	Pass	
105	SP00002D	6	1.43	154.94	90	64.64	31.48	Pass	Pass	
106	SP00002F	5	2.31	173.52	90	32.14	17.14	Pass	Pass	
107	SP00002F	5	2.31	173.52	90	38.37	21.69	Pass	Pass	
108	SP000031	2	1.43	188.53	90	77.76	34.7	Pass	Pass	
109	SP000037	5	0.55	352.65	90	13.44	0	Fail	Fail	
110	SP000034	9	1.89	172.87	90	43.9	19.57	Pass	Pass	
111	SP000034	9	1.89	172.87	90	48.24	20.92	Pass	Pass	
112	SP000034	10	2.25	262.96	90	54.86	21.53	Pass	Pass	
113	SP000034	11	1.1	352.98	90	17.09	0	Fail	Fail	
114	SP000034	11	1.3	352.98	90	17.98	0	Fail	Fail	
115	SP000039	2	1.5	188.75	90	81.25	38.19	Pass	Pass	
116	SP000039	2	1.5	188.75	90	81.25	38.19	Pass	Pass	
117	SP000039	2	1.5	188.75	90	81.25	38.19	Pass	Pass	
118	SP000039	3	1.89	262.95	90	54.86	21.53	Pass	Pass	
119	SP000039	3	1.89	262.95	90	54.86	21.53	Pass	Pass	
120	SP000039	4	2.1	352.87	90	18.06	0	Fail	Fail	
121	SP00003A	7	1.3	352.37	90	18.06	0	Fail	Fail	
122	SP00003B	5	0.06	354.59	90	0	0	Fail	Fail	
123	SP00003B	5	0.06	354.59	90	0	0	Fail	Fail	
124	1F000001	5	0.06	354.59	90	0	0	Fail	Fail	
125	1F000001	5	0.06	354.59	90	0	0	Fail	Fail	

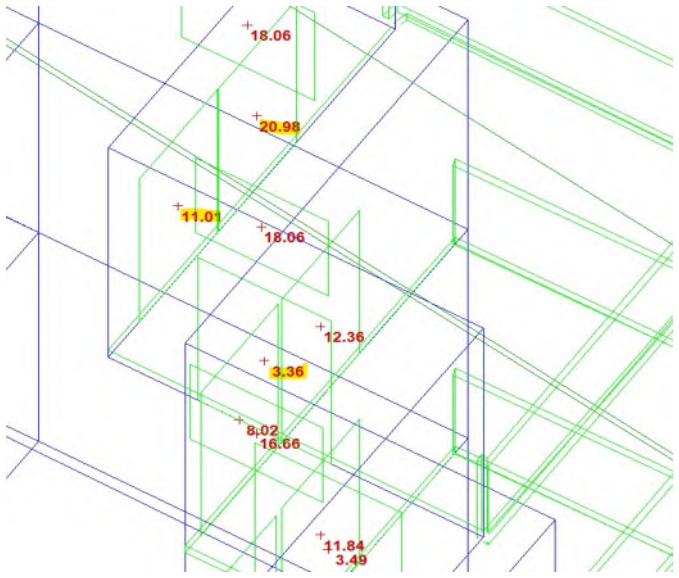
Total assessed with in 90 degree of due south	**125**		
Pass Annual	66	**52.80%**	**56.80%**
Marginal Fail- Pass2 Annual	5	**4.00%**	
Fail Annual	54	**43.20%**	
Pass Winter	70	**56.00%**	**56.00%**
Marginal Fail- Pass2 Winter	0	**0.00%**	
Fail Winter	55	**44.00%**	

Flat 02- Kitchen Living Dining

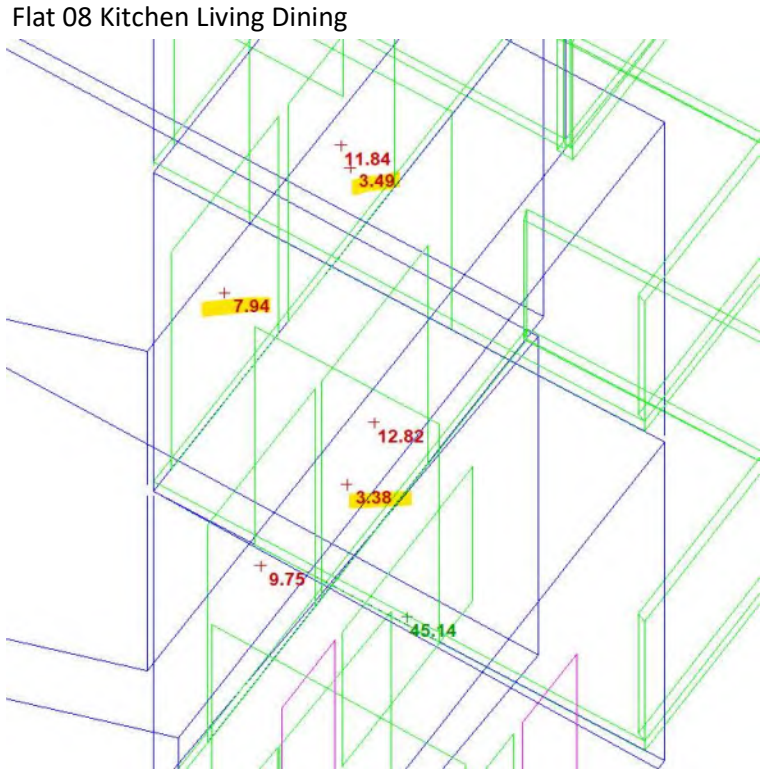
Flat 05 - kitchen living dining



Flat 14 Kitchen Living Dining



Flat 08 Kitchen Living Dining



APPENDIX E

Exisiting Building	Opening	Zone	Surface	Area	Azimuth	Annual	Winter	Annual	Winter	Annual % Reduction	Winter % Reduction	Location Description
31 A Daleham Gardens	1	DL000008	4	0.96	90	19.93	0	15.97	0			
	2	DL000008	11	1.4	27.47	77.08	28.47	77.08	28.47			
	3	DL000008	11	1.4	27.47	77.08	28.47	77.08	28.47			
	4	DL000008	16	1.4	41.32	65.92	22.17	64.54	22.17			
	5	DL000008	16	1.4	41.32	58.69	18.56	58.37	18.56			
	6	DL000008	16	1.4	41.32	70.7	26.95	69.35	26.95			
	7	DL000008	16	1.4	41.32	70.83	27.08	69.44	27.08			
	8	DL000008	18	0.24	90	40.05	15.97	38.66	15.97			
	9	DL000008	18	0.24	90	40.38	16.29	38.99	16.29			
	10	DL000008	18	0.54	90	48.74	18.93	47.35	18.93			
	11	DL000008	18	0.54	90	47.88	18.73	46.49	18.73			
	12	DL000008	18	0.54	90	47.39	18.41	45.8	18.41			
	13	DL000008	18	0.54	90	47.41	18.44	46.02	18.44			
	14	DL000008	30	0.24	90	40.05	15.97	40.05	15.97			
	15	DL000008	30	0.24	90	40.38	16.29	40.38	16.29			
	16	DL000008	30	0.54	90	49.22	19.41	49.22	19.41			
	17	DL000008	30	0.54	90	48.23	19.09	48.23	19.09			
	18	DL000008	30	0.54	90	47.49	18.51	47.49	18.51			
	19	DL000008	30	0.54	90	47.64	18.66	47.64	18.66			
	20	DL000003	4	0.84	90	50	19.44	48.94	19.44			
	21	DL000003	4	0.84	90	50	19.44	48.68	19.44			
	22	DL000003	4	0.84	90	50	19.44	50	19.44			
	23	DL000003	4	0.84	90	50	19.44	50	19.44			
	24	DL000003	4	0.84	90	50	19.44	50	19.44			
	25	DL000003	4	0.84	90	50	19.44	50	19.44			
	26	DL000003	5	0.96	90	17.75	0	14.86	0			
	27	DL000005	9	1.8	90	50	19.44	47.82	19.44			
	28	DL000005	9	1.8	90	50	19.44	48.48	19.44			
	29	DL000005	9	0.5	90	50	19.44	49.2	19.44			
	30	DL000005	9	0.5	90	50	19.44	49.41	19.44			
	31	DL000005	10	0.96	90	15.04	0	12.85	0			
Gloucestor School	32	GL000000	4	0.5	90	29.79	5.38	29.41	4.86			
	33	GL000000	4	0.13	90	22.21	6.64	21.67	6.09			
	34	GL000000	4	1.25	90	33.51	8.1	32.87	7.53			
	35	GL000000	4	0.31	90	24	8.42	23.92	8.35			
	36	GL000000	4	0.13	90	24.26	8.69	24.26	8.69			
	37	GL000000	4	0.5	90	34.13	8.71	33.56	8.13			
	38	GL000000	4	0.5	90	32.87	7.74	31.56	6.47			
	39	GL000000	4	0.13	90	23.8	8.23	23.14	7.56			
	40	GL000000	4	0.31	90	23.28	7.71	22.74	7.17			
	41	GL000000	4	1.25	90	31.23	6.64	30.9	5.92			
	42	GL000000	4	1.25	90	36.76	11.33	36.78	11.36			
	43	GL000000	4	0.31	90	25.43	9.85	25.06	9.48			
	44	GL000000	4	0.13	90	25.9	10.33	25.43	9.85			
	45	GL000000	4	0.5	90	37.49	12.07	37.23	11.81			
	46	GL000000	4	0.5	90	38.19	12.77	38.66	13.24			
	47	GL000000	4	0.13	90	26.03	10.46	26.03	10.46			
	48	GL000000	4	0.31	90	26.03	10.46	25.77	10.2			
	49	GL000000	4	1.25	90	37.84	12.41	37.9	12.48			
	50	GL000000	4	1.25	90	35.87	10.45	35.66	10.24			
	51	GL000000	4	0.31	90	24.93	9.36	24.4	8.83			
	52	GL000000	4	0.13	90	25.02	9.44	25.01	9.44			
	53	GL000000	4	0.5	90	36.18	10.76	35.79	10.36			
	54	GL000000	4	0.5	90	35.53	10.11	35.53	10.11			
	55	GL000000	4	0.13	90	24.81	9.24	24.26	8.69			
	56	GL000000	4	0.31	90	24.26	8.69	24.26	8.69			
	57	GL000000	4	1.25	90	34.5	9.07	34.64	9.22			
	58	GL000000	4	0.5	90	38.4	12.98	39.06	13.63			
	59	GL000000	4	0.13	90	26.03	10.46	26.03	10.46			
	60	GL000000	4	0.31	90	26.03	10.46	26.03	10.46			
	61	GL000000	4	1.25	90	38.35	12.93	38.96	13.54			
	62	GL000000	4	1.25	90	39.2	13.78	39.2	13.78			
	63	GL000000	4	0.31	90	26.03	10.46	26.03	10.46			
	64	GL000000	4	0.13	90	26.03	10.46	26.03	10.46			
	65	GL000000	4	0.5	90	39.25	13.83	39.25	13.83			
	66	GL000000	4	0.5	90	38.99	13.56	39.15	13.73			
	67	GL000000	4	0.13	90	26.03	10.46	26.03	10.46			
	68	GL000000	4	0.31	90	26.03	10.46	26.03	10.46			
	69	GL000000	4	1.25	90	38.5	13.08	39.11	13.68			
	70	GL000000	5	1.25	90	44.44	16.01	26.69	3.59	39.9%	77.6%	South Facing Windows of Gloucester School (Refer to Appendix I to locate the window maps as per the openings)
	71	GL000000	5	0.5	90	43.23	16.16	25.38	3.45	41.3%	78.7%	
	72	GL000000	5	0.31	90	19.08	16.38	5.62	3.87	70.5%	76.4%	
	73	GL000000	5	0.13	90	18.93	16.35	4.54	3.07	76.0%	81.2%	
	74	GL000000	5	0.12	90	21.44	18.73	4.43	3.13	79.3%	83.3%	
	75	GL000000	5	0.31	90	20.6	17.88	4.55	3.15	77.9%	82.4%	
	76	GL000000	5	0.5	90	46.48	18.7	25.38	3.95	45.4%	78.9%	
	77	GL000000	5	1.25	90	44.98	17.84	25.34	3.75	43.7%	79.0%	
	78	GL000000	5	1.25	90	49.95	20.93	25.78	4.01	48.4%	80.8%	
	79	GL000000	5	0.5	90	52.92	22.09	27.51	4.28	48.0%	80.6%	
	80	GL000000	5	0.31	90	22.96	20.59	4.53	3.38	80.3%	83.6%	
	81	GL000000	5	0.12	90	24.55	21.89	4.91	3.74	80.0%	82.9%	
	82	GL000000	5	0.13	90	23.06	20.43	4.51	3.35	80.4%	83.6%	
	83	GL000000	5	0.31	90	22.68	20.03	4.75	3.53	79.1%	82.4%	
	84	GL000000	5	0.5	90	49.03	20.4	25.74	4.1	47.5%	79.9%	
	85	GL000000	5	1.25	90	48.21	20	25.53	4.36	47.0%	78.2%	

Exisiting Building	Opening	Zone	Surface	Area	Azimuth	Annual	Winter	Annual	Winter	Annual % Reduction	Winter % Reduction	Location Description
32A Daleham Gardens	86	32000000	1	0.32	0	46.09	16.45	47.34	16.45			
	87	32000000	1	0.32	0	42.96	13.64	43.29	13.64			
	88	32000000	2	2.04	90	28.07	7.83	31.16	7.83			
	89	32000000	2	2.04	90	38.34	14.52	40.14	14.52			
	90	32000000	4	0.66	90	39.86	15.78	42.9	15.78			
	91	32000000	5	0.24	90	31.02	10.72	31.02	10.72			
	92	32000000	5	0.49	90	29.34	10.43	29.34	10.43			
	93	32000000	6	0.78	90	28.56	6.95	28.67	6.95			
	94	32000000	6	0.78	90	20.38	3.35	19.88	3.35			
32B Daleham Gardens	95	32000004	5	4.2	90	48.99	24.1	48.79	24.1			
	96	32000004	5	0.98	90	47.36	22.43	47.04	22.43			
	97	32000004	5	2.44	90	46.74	21.88	46.01	21.88			
	98	32000004	5	0.98	90	49.3	23.61	47.91	23.61			
	99	32000004	5	2.44	90	48.56	22.92	47.38	22.92			
	100	32000004	5	0.98	90	49.14	23.61	48.44	23.61			
	101	32000004	5	2.44	90	49.23	23.61	47.68	23.61			
32A Daleham Gardens	102	32000001	2	0.64	90	46.53	20.14	49.01	20.14			
	103	32000001	2	0.64	90	46.31	20.14	49.65	20.14			
	104	32000001	2	0.64	90	46.55	20.14	49.04	20.14			
	105	32000001	2	0.22	90	47	20.3	49.5	20.3			
	106	32000001	2	0.22	90	46.36	20.19	50.14	20.19			
	107	32000001	2	0.23	90	47.17	20.14	50.01	20.14			
	108	32000001	3	0.74	90	36.31	10.49	37.32	10.49			
	109	32000001	3	0.26	90	44.78	18.93	46.03	18.93			
	110	32000001	9	0.8	90	46.22	19.36	46.66	19.36			
	111	32000001	9	0.74	90	47.43	19.94	48.07	19.94			
	112	32000001	9	0.28	90	47.7	20.83	48.89	20.83			
	113	32000001	9	0.26	90	48.05	19.87	48.52	19.87			
32B Daleham Gardens	114	32000007	5	0.98	90	49.11	22.68	50.13	22.68			
	115	32000007	5	2.44	90	49.4	22.35	49.26	22.35			
	116	32000007	5	0.98	90	51.06	23.61	50.32	23.61			
	117	32000007	5	2.44	90	50.23	22.92	49.81	22.92			
	118	32000007	5	0.98	90	50.46	23.66	50.46	23.66			
	119	32000007	5	2.44	90	50.59	23.61	50.57	23.61			
	120	32000008	5	0.98	90	48.51	22.43	48.54	22.43			
	121	32000008	5	2.44	90	48.5	22.22	47.8	22.22			
	122	32000008	5	0.98	90	50.39	23.61	48.72	23.61			
	123	32000008	5	2.44	90	49.57	22.92	48.43	22.92			
	124	32000008	5	0.98	90	49.85	23.61	49.41	23.61			
	125	32000008	5	2.44	90	49.95	23.61	49.02	23.61			
32 Daleham Gardens	126	3200000A	10	1.5	90	40.87	12.59	42.76	14.19			
	127	3200000A	10	1.5	90	41.4	12.5	43.95	14.59			
	128	3200000A	10	1.5	90	42.1	12.5	44.1	14.02			
	129	3200000A	10	1.5	90	41.68	11.97	44.04	13.82			
	130	3200000A	10	1.68	90	42	11.81	44.26	13.3			
	131	3200000A	11	1.52	90	42.01	14.36	44.86	16.42			
	132	3200000A	11	1.52	90	51.81	17.46	54.33	19.31			
	133	3200000A	11	1.53	90	55.73	19.24	56.46	20.23			
	134	3200000A	16	0.32	90	15.21	0.69	17.83	2.08			
	135	3200000A	16	1.19	90	14.5	0.71	17.12	2.08			
	136	3200000A	17	0.29	90	41.55	13.89	43.75	14.58			
	137	3200000A	17	1.1	90	40.91	14.63	43.59	15.32			
	138	3200000A	17	0.32	90	40.79	13.74	42.79	14.34			
	139	3200000A	17	1.21	90	39.92	14.21	42.36	14.81			
	140	3200000A	18	0.35	90	44.85	14.16	45.83	14.71			
	141	3200000A	18	1.25	90	41.65	13.75	42.7	13.75			
	142	RF000002	18	1.16	90	42.06	13.36	43.18	13.79			

Total Number of Windows:	142	
Windows with under 0.80 times its former value:	89%	126
Windows with over 0.80 times its former value:	11%	16

Building	Percentage of Windows with under 0.80 times its former value	Percentage of Windows with Over 0.80 times its former value
31A Daleham Gardens	100%	0%
Gloucester School	70%	30%
32A Daleham Gardens	100%	0%
32B Daleham Gardens	100%	0%
32 Daleham Gardens	100%	0%

APPENDIX F

31 Daleham Gardens

Solar Shading Images

Suncast image:
View time = 21 Mar 06:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun is not up
Eye: azi = 95.00 alt = 90.00

31 Daleham Gardens

Solar Shading Images

Suncast image:
View time = 21 Mar 07:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 100.16 alt = 7.48
Eye: azi = 95.00 alt = 90.00

31 Daleham Gardens

Solar Shading Images

Suncast image:
View time = 21 Mar 08:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 112.48 alt = 16.43
Eye: azi = 95.00 alt = 90.00

31 Daleham Gardens

Solar Shading Images

Suncast image:
View time = 21 Mar 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 125.95 alt = 24.58
Eye: azi = 95.00 alt = 90.00

31 Daleham Gardens

Solar Shading Images

Suncast image:
View time = 21 Mar 10:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 141.13 alt = 31.35
Eye: azi = 95.00 alt = 90.00

31 Daleham Gardens

Solar Shading Images

Suncast image:
View time = 21 Mar 11:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 158.28 alt = 36.06
Eye: azi = 95.00 alt = 90.00

31 Daleham Gardens

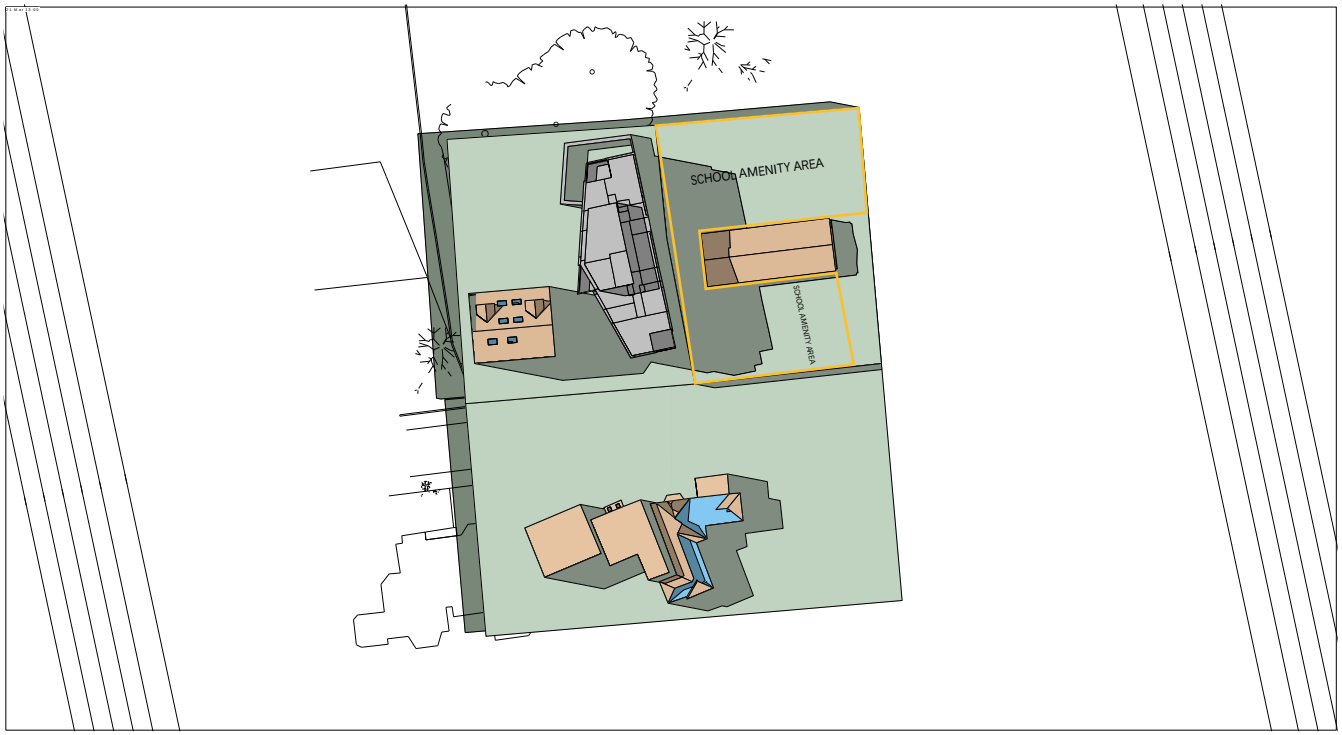
Solar Shading Images

Suncast image:
View time = 21 Mar 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 176.94 alt = 38.07
Eye: azi = 95.00 alt = 90.00

31 Daleham Gardens

Solar Shading Images

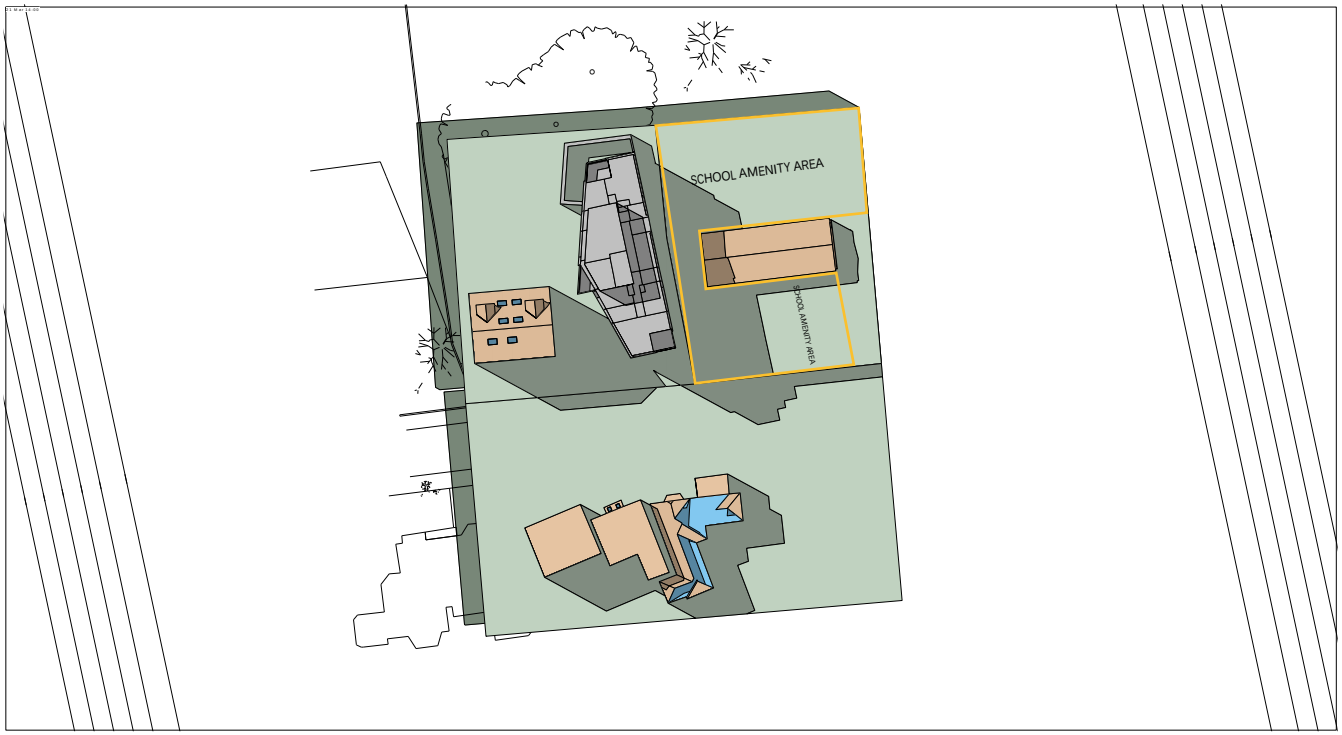
Suncast image:
View time = 21 Mar 13:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 195.84 alt = 37.03
Eye: azi = 95.00 alt = 90.00



31 Daleham Gardens

Solar Shading Images

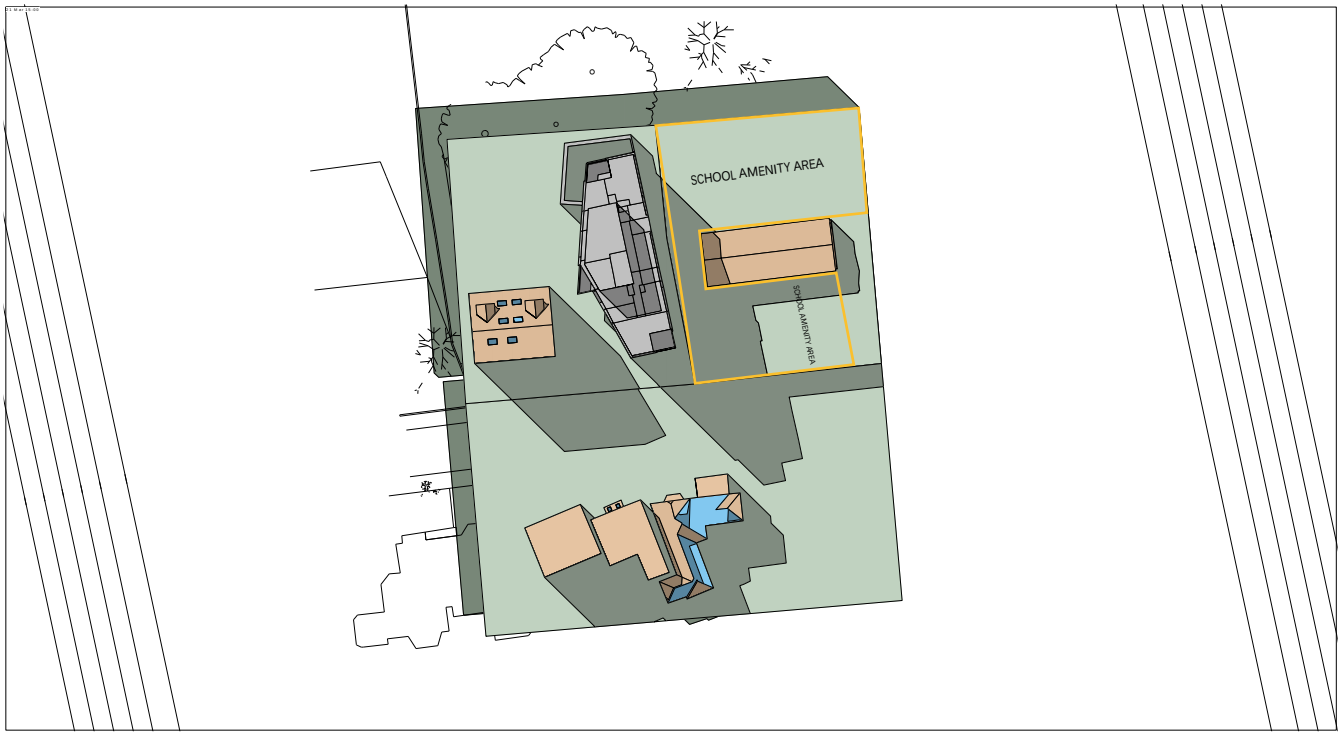
Suncast image:
View time = 21 Mar 14:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 213.57 alt = 33.12
Eye: azi = 95.00 alt = 90.00



31 Daleham Gardens

Solar Shading Images

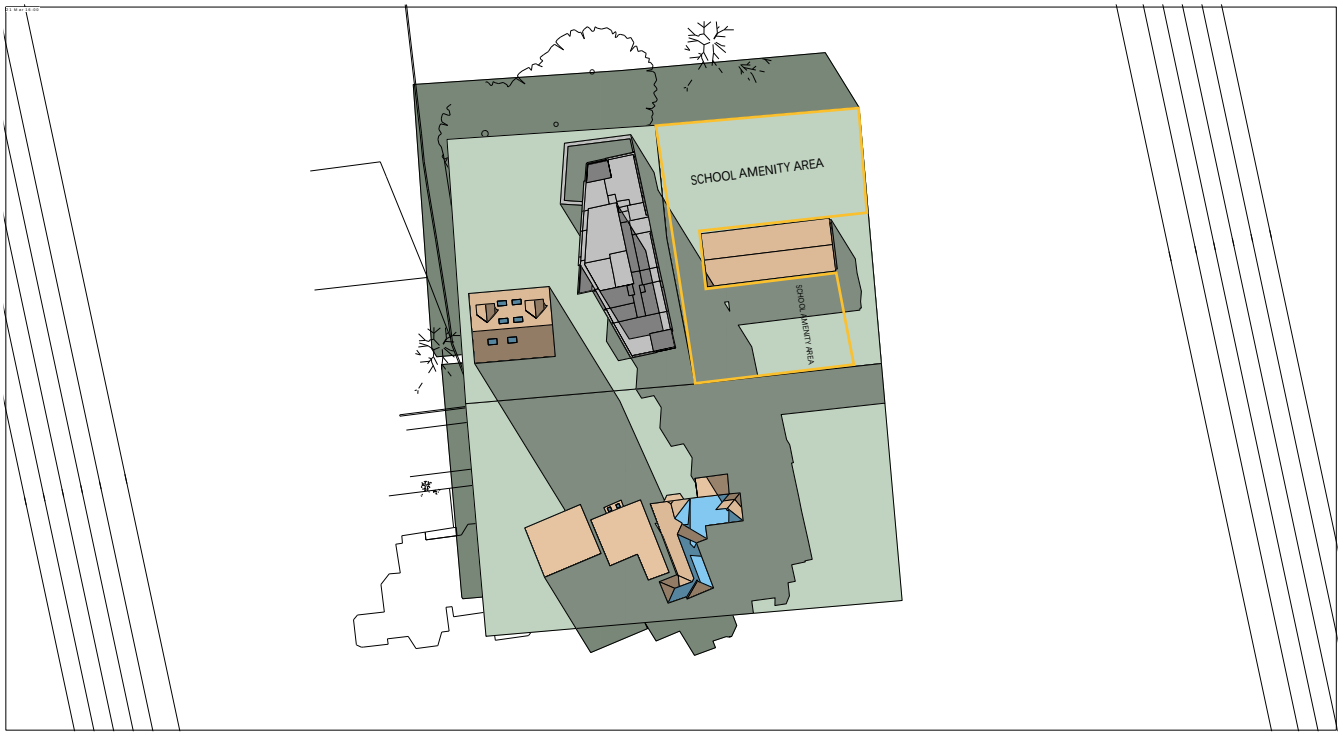
Suncast image:
View time = 21 Mar 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 229.38 alt = 26.93
Eye: azi = 95.00 alt = 90.00



31 Daleham Gardens

Solar Shading Images

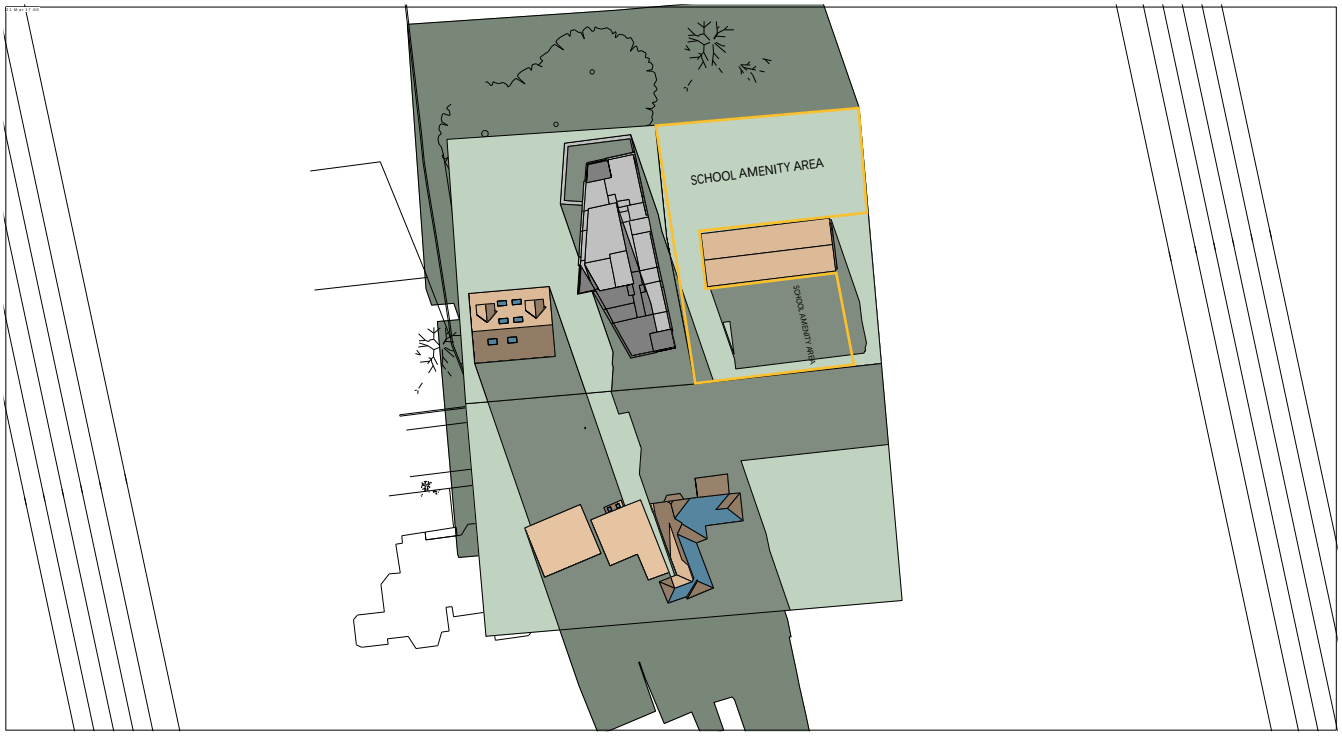
Suncast image:
View time = 21 Mar 16:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 243.34 alt = 19.16
Eye: azi = 95.00 alt = 90.00



31 Daleham Gardens

Solar Shading Images

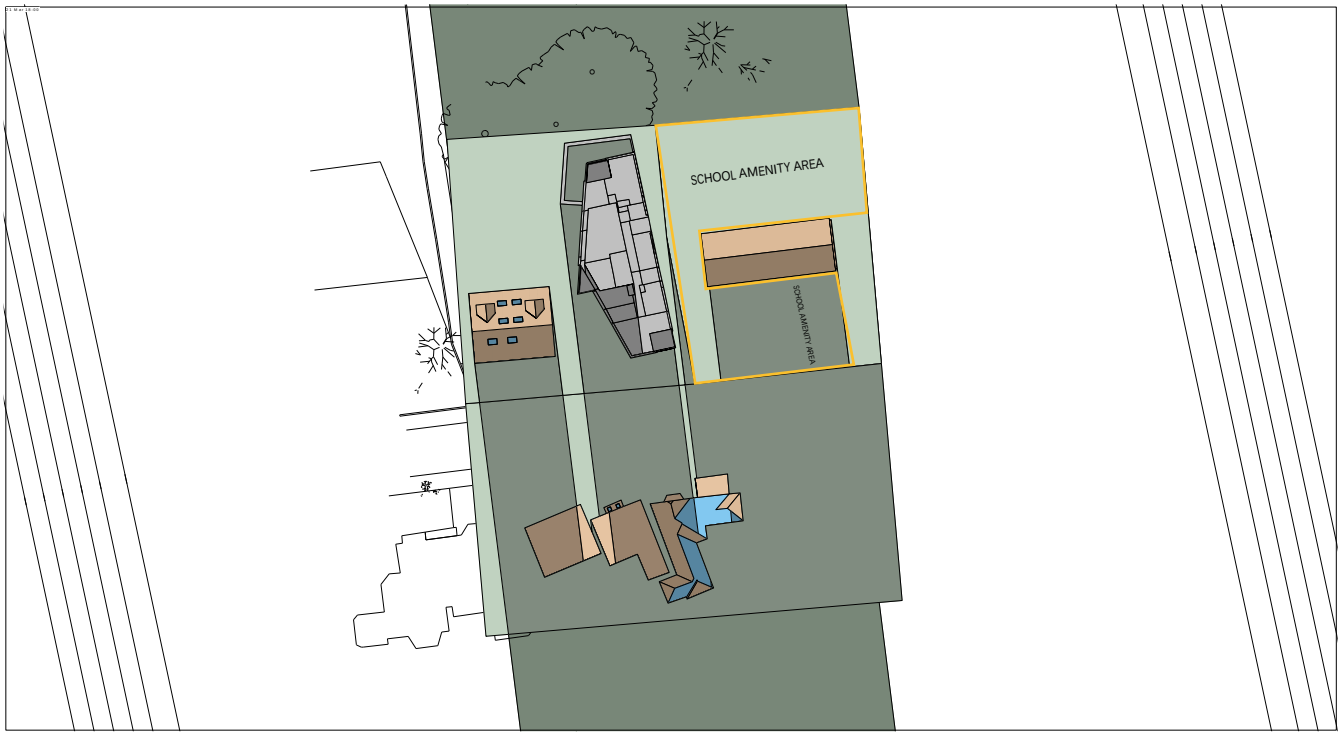
Suncast image:
View time = 21 Mar 17:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 255.96 alt = 10.42
Eye: azi = 95.00 alt = 90.00



31 Daleham Gardens

Solar Shading Images

Suncast image:
View time = 21 Mar 18:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 267.86 alt = 1.18
Eye: azi = 95.00 alt = 90.00

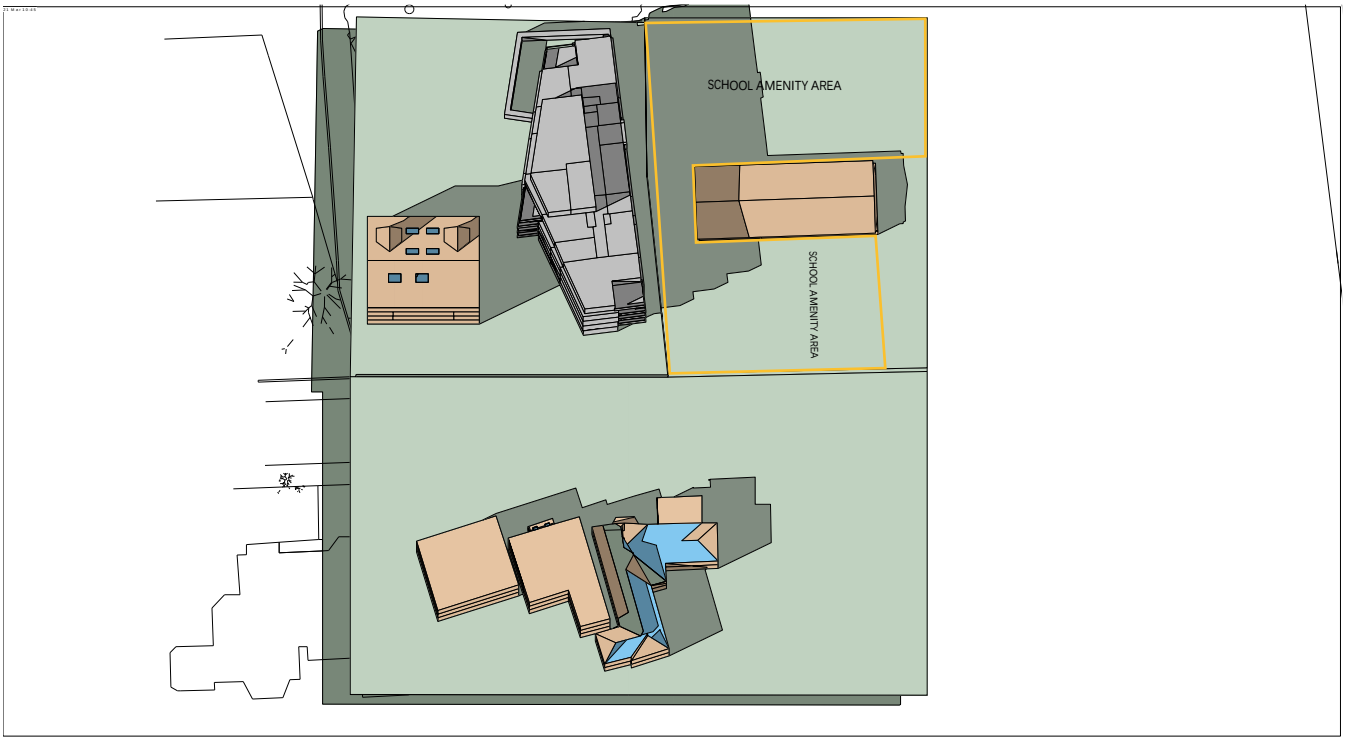


31 Daleham Gardens

Solar Shading Images

Solar Shading Images: School Break Times (10:45 - 12:45) Throughout the Year

Suncast image:
View time = 21 Mar 10:45
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 153.77 alt = 35.52
Eye: azi = 90.00 alt = 80.00



31 Daleham Gardens

Solar Shading Images

Suncast image:

View time = 21 Mar 11:45
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 172.24 alt = 38.26
Eye: azi = 90.00 alt = 80.00

31 Daleham Gardens

Solar Shading Images

Suncast image:
View time = 21 Mar 12:45
Site Latitude = 51.48
Longitude diff. = -0.45
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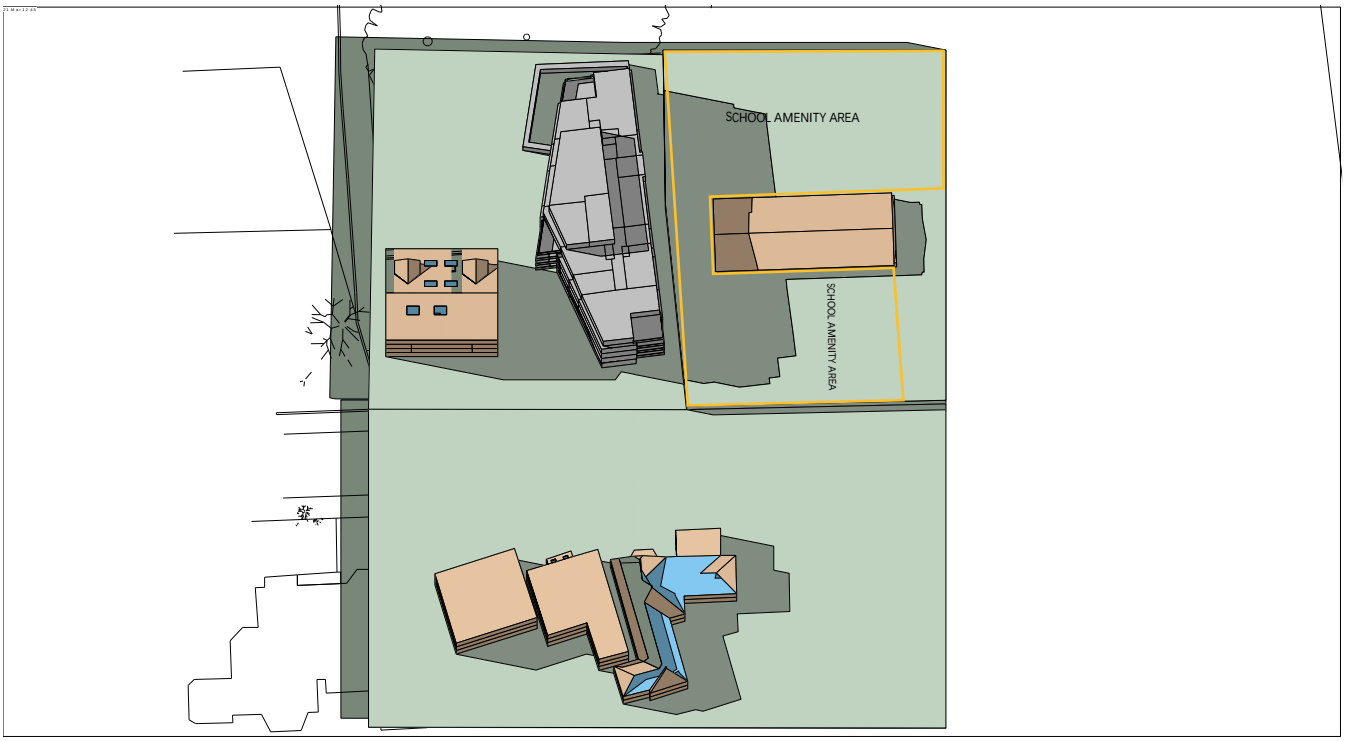
Sun: azi = 191.34 alt = 37.97
Eye: azi = 90.00 alt = 80.00



31 Daleham Gardens

Solar Shading Images

Suncast image:
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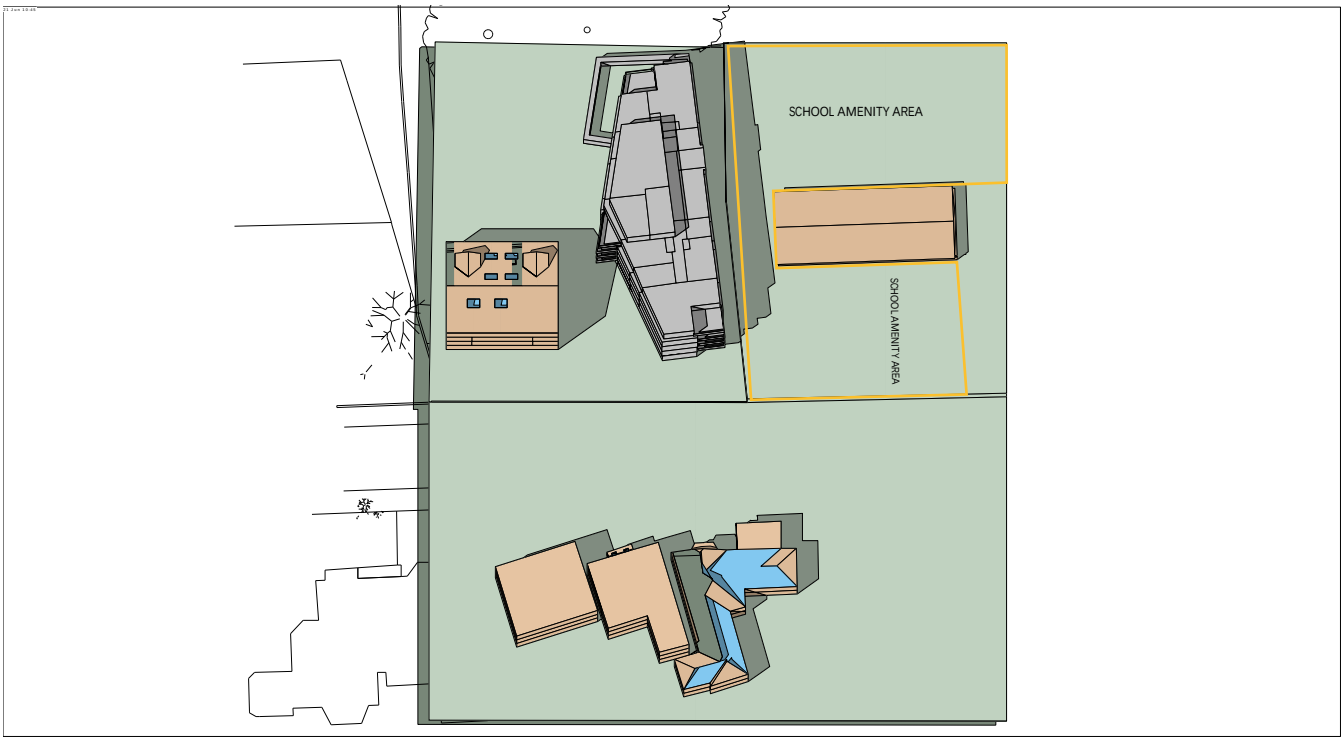

31 Daleham Gardens

Solar Shading Images

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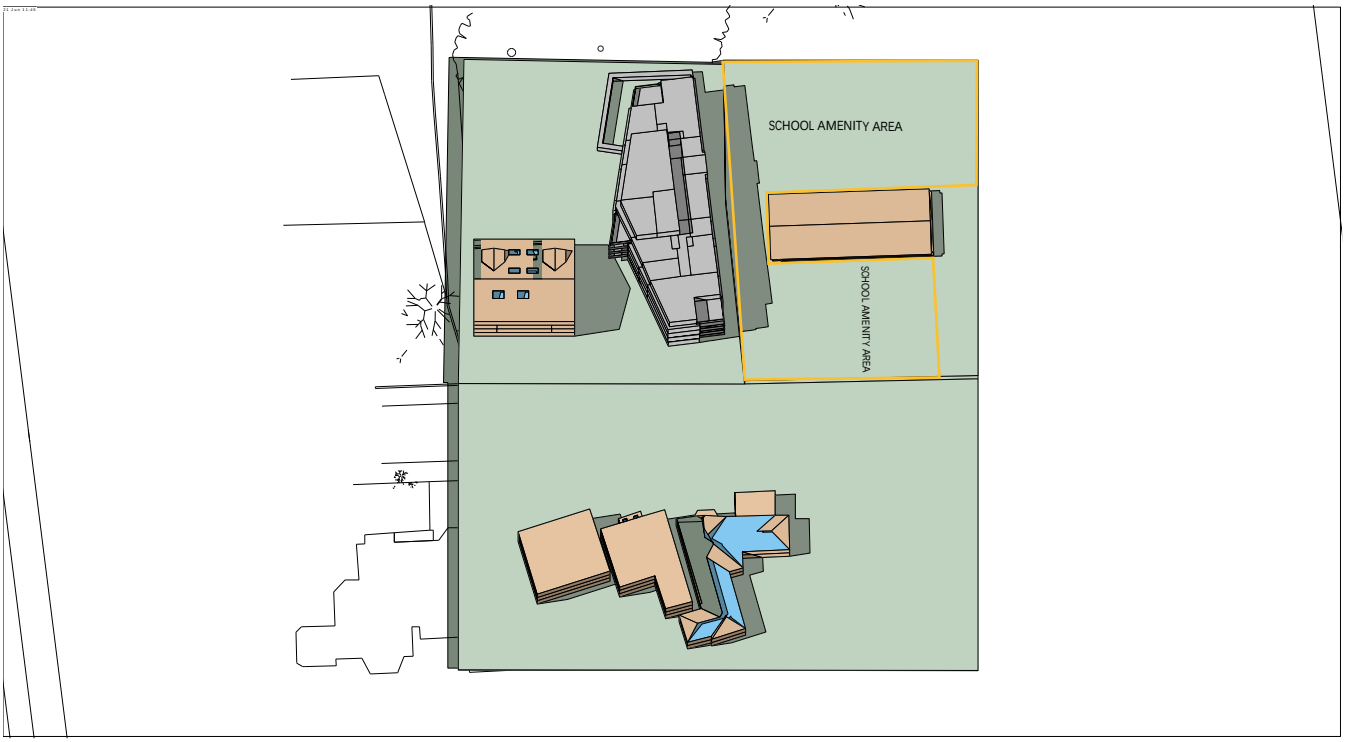

31 Daleham Gardens

Solar Shading Images

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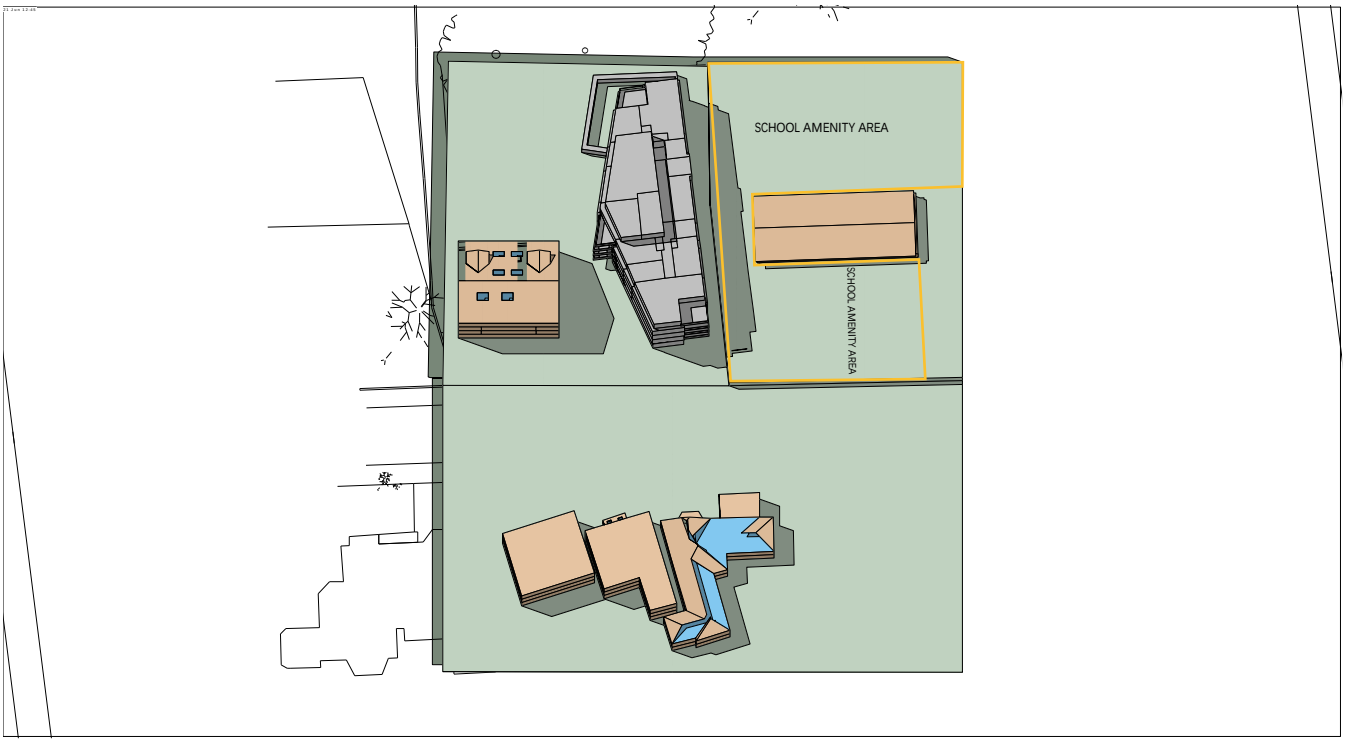

31 Daleham Gardens

Solar Shading Images

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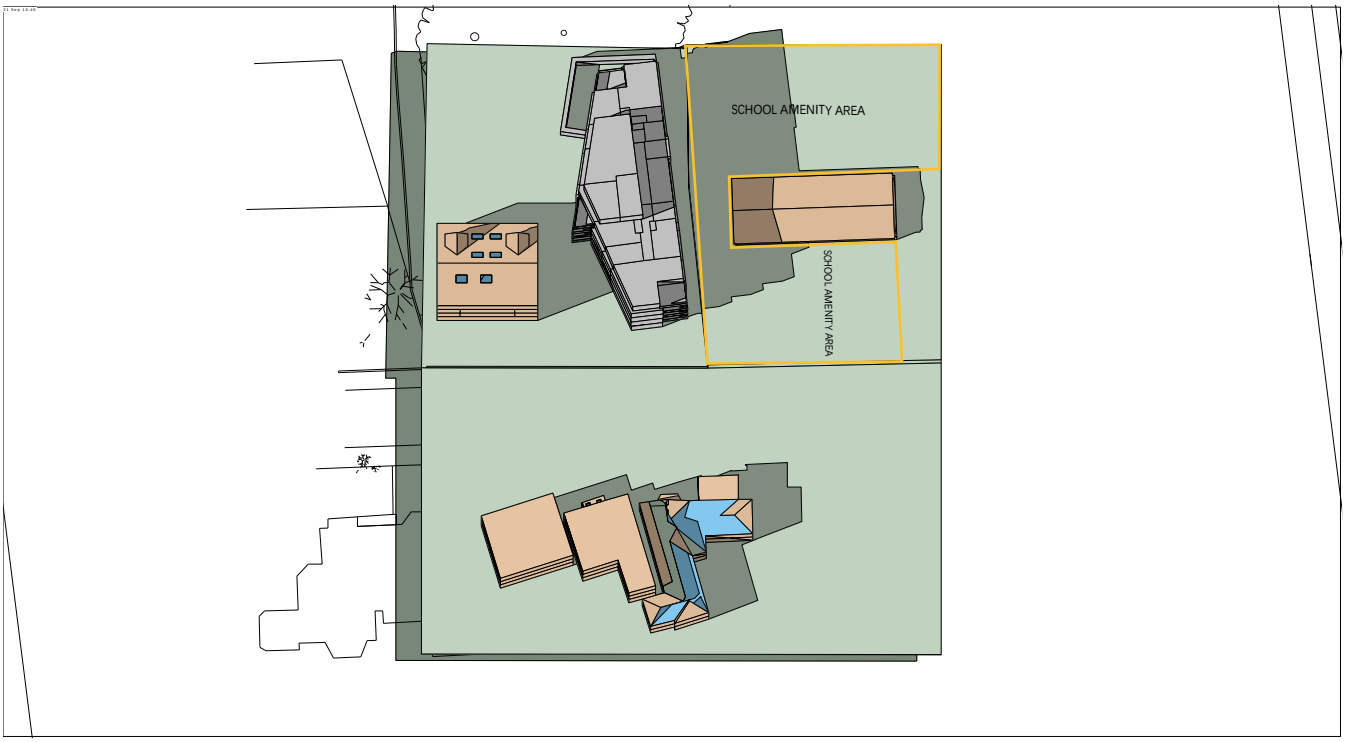
Sun: azi = 158.66 alt = 35.94
Eye: azi = 90.00 alt = 80.00



31 Daleham Gardens

Solar Shading Images

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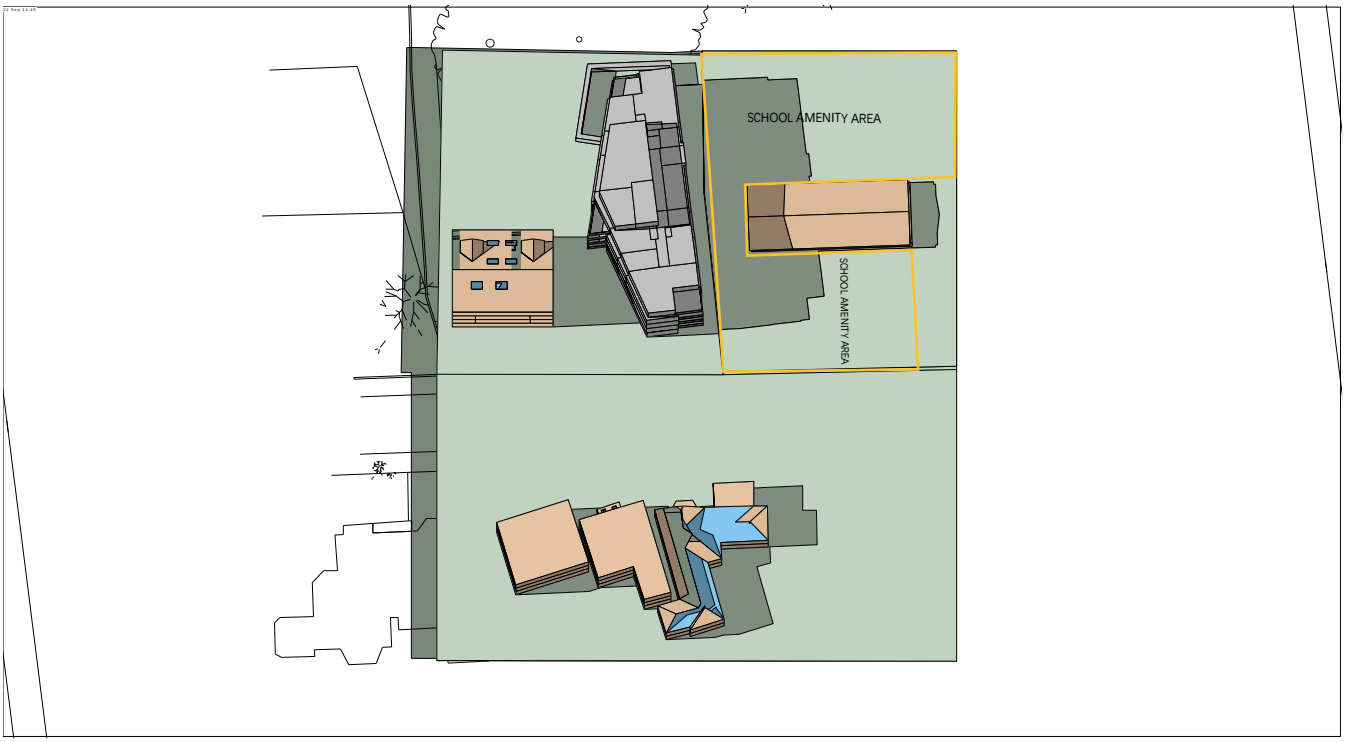

31 Daleham Gardens

Solar Shading Images

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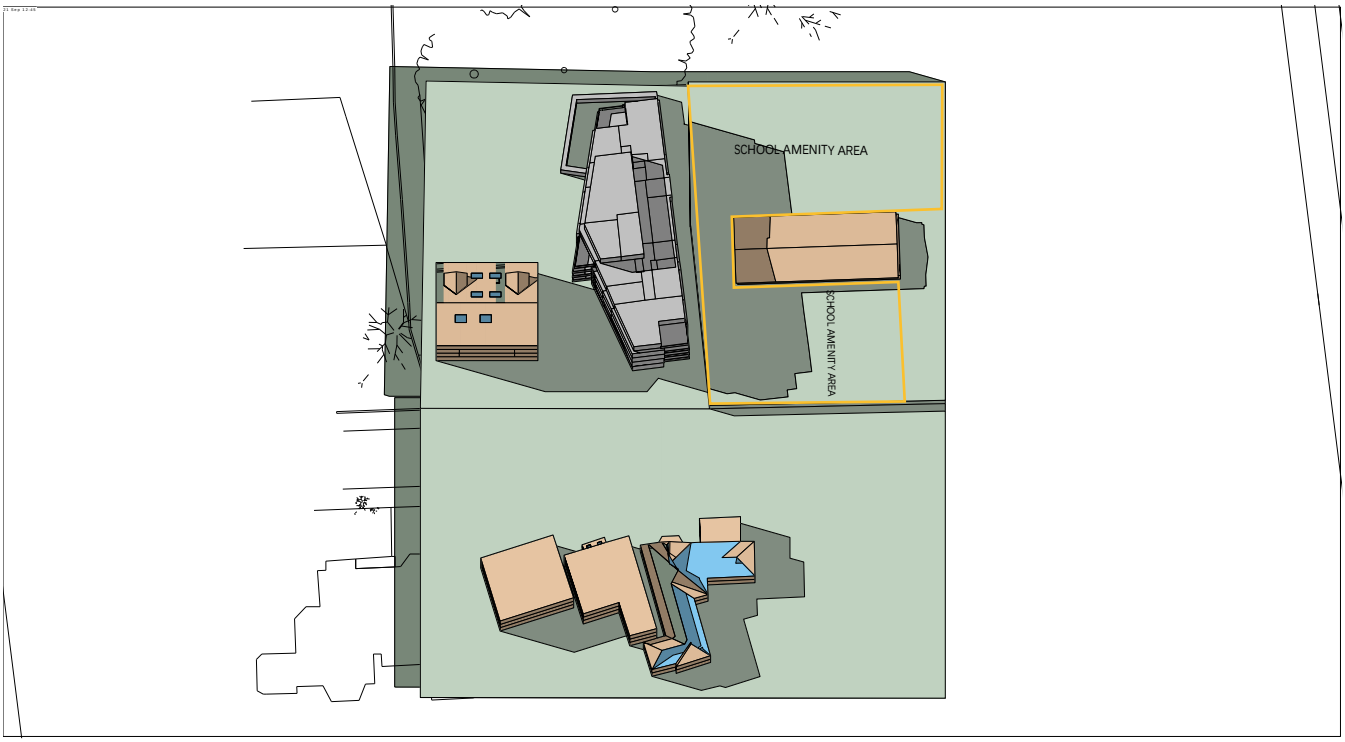

31 Daleham Gardens

Solar Shading Images

Suncast image:
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Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 162.08 alt = 13.22
Eye: azi = 90.00 alt = 80.00

31 Daleham Gardens

Solar Shading Images

Suncast image:
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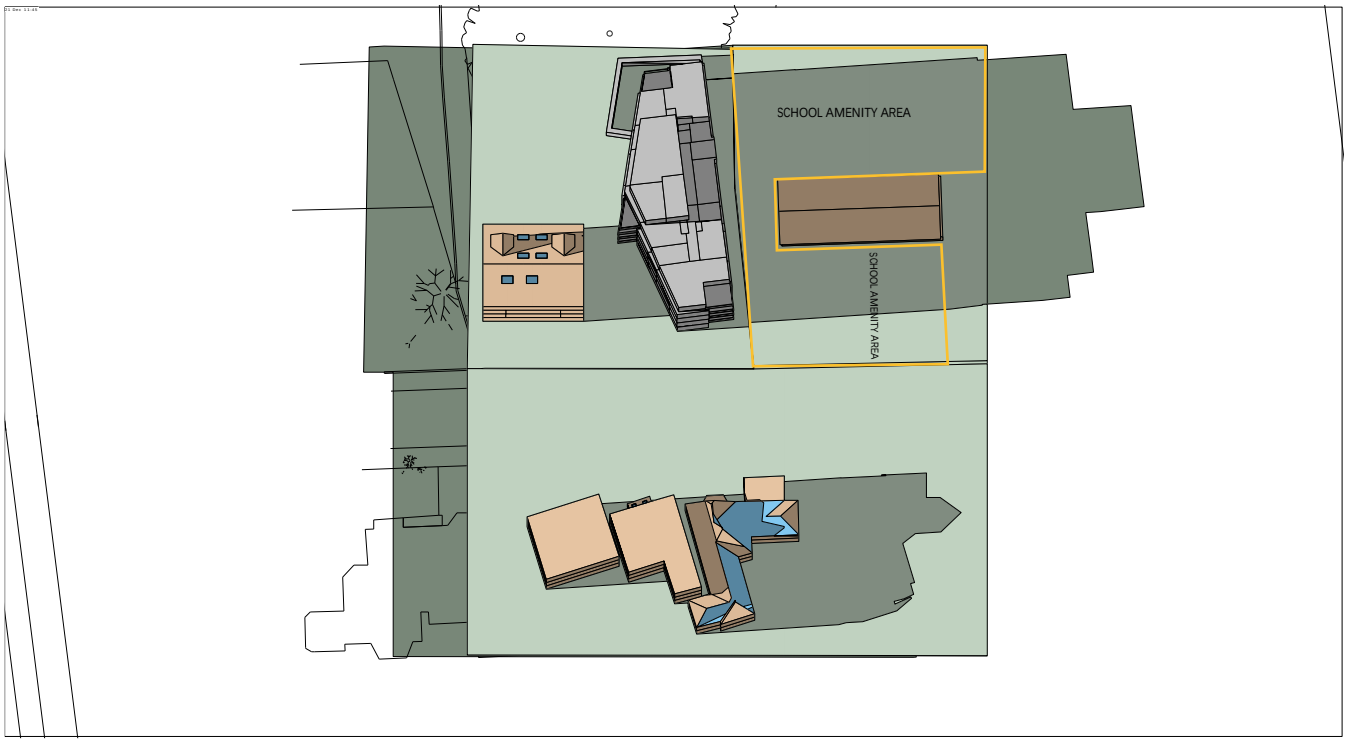
Eye: azi = 90.00 alt = 80.00



31 Daleham Gardens

Solar Shading Images

Suncast image:
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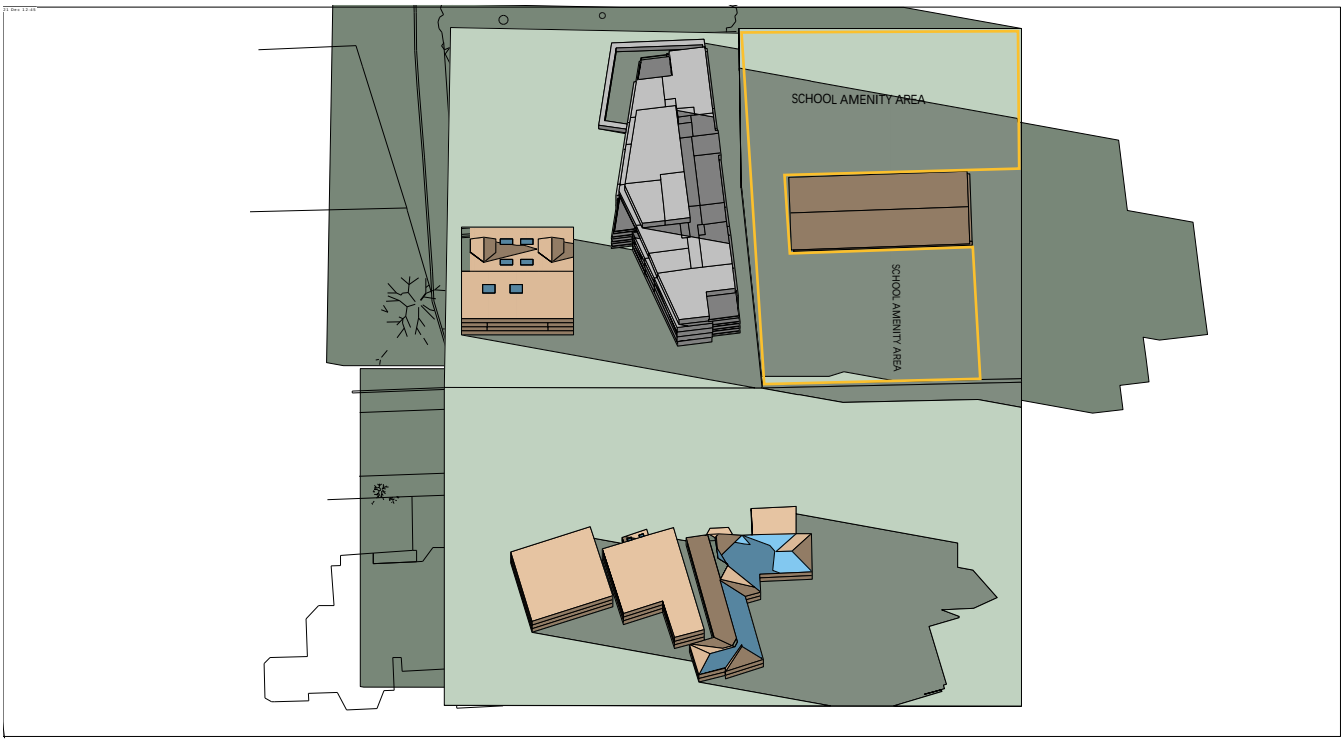
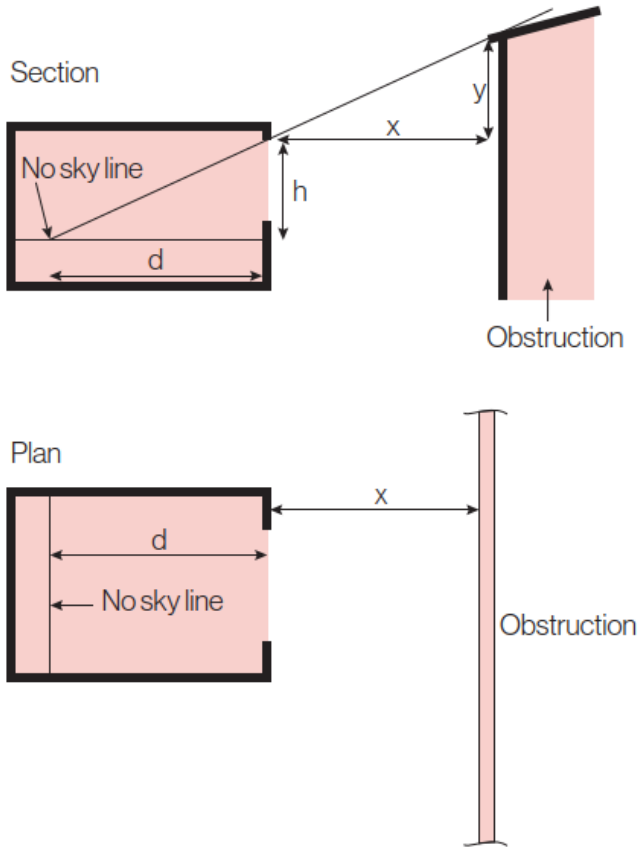
Eye: azi = 90.00 alt = 80.00



APPENDIX G

d = x h / y from its outside face.
Here:
h is the height of the window head above the working plane
y is the height of the obstruction above the window head
x its distance from the outside window wall.
If d is greater than the room depth, no part of the room lies beyond the no sky line.



31 Daleham Gardens

App G- No Skyline Components

1. **No Sky line Component for Flat 01- Kitchen Living Dining= 74%**

   H=0.85m

   x=4.40m

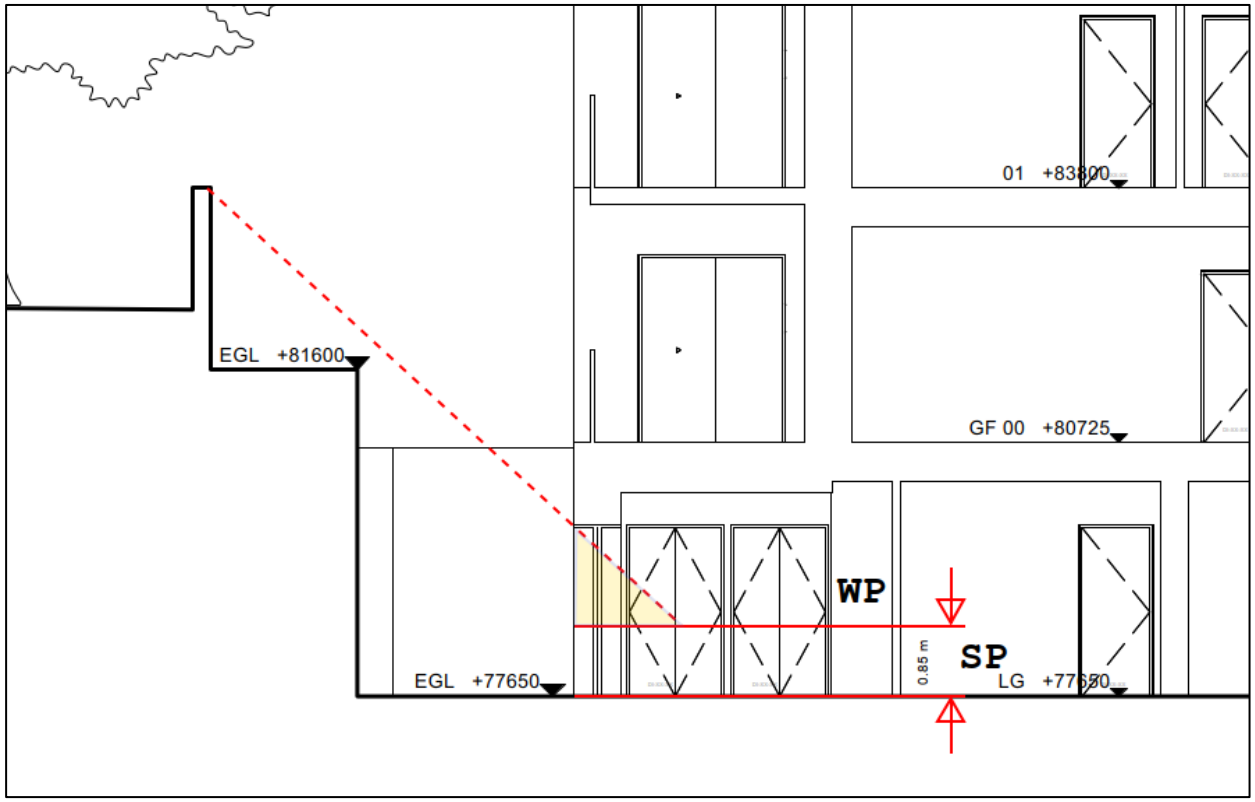
   y= 4.08m

   d= x h / y = 4.40 x 0.85 / 4.08 = 0.916m

   Well Lit Area= 6.35 sqm

   Room Area = 23.75 sqm

   Area of the room that can “see” the sky= 6.35sqm (26% of total room area)



31 Daleham Gardens

App G- No Skyline Components

2. **No Sky line Component for Flat 01- Bedroom= 60%**

   H=0.85m

   x=4.09m

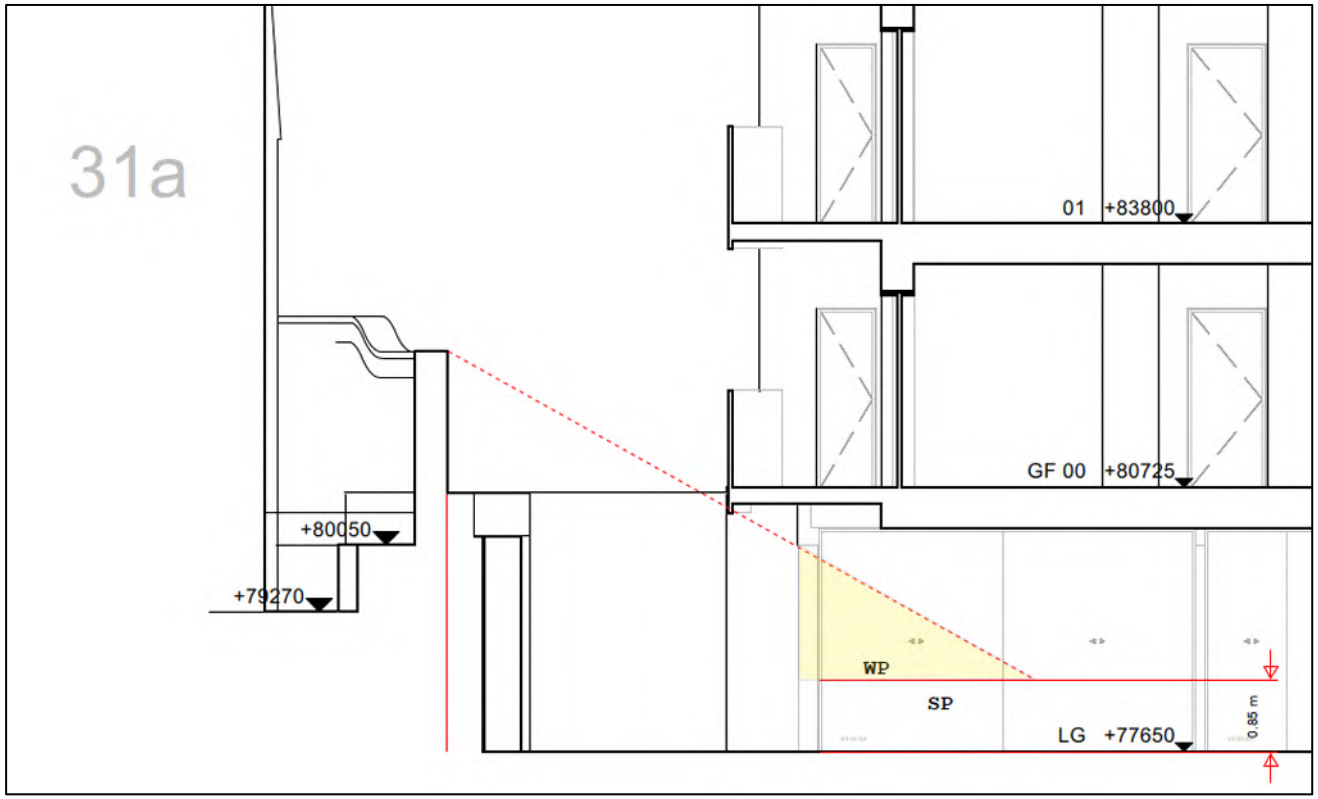
   y= 2.25m

   d= x h / y = 4.09 x 0.85 / 2.25 = 1.54m

   Well Lit Area= 5.08sqm

   Room Area = 12.44 sqm

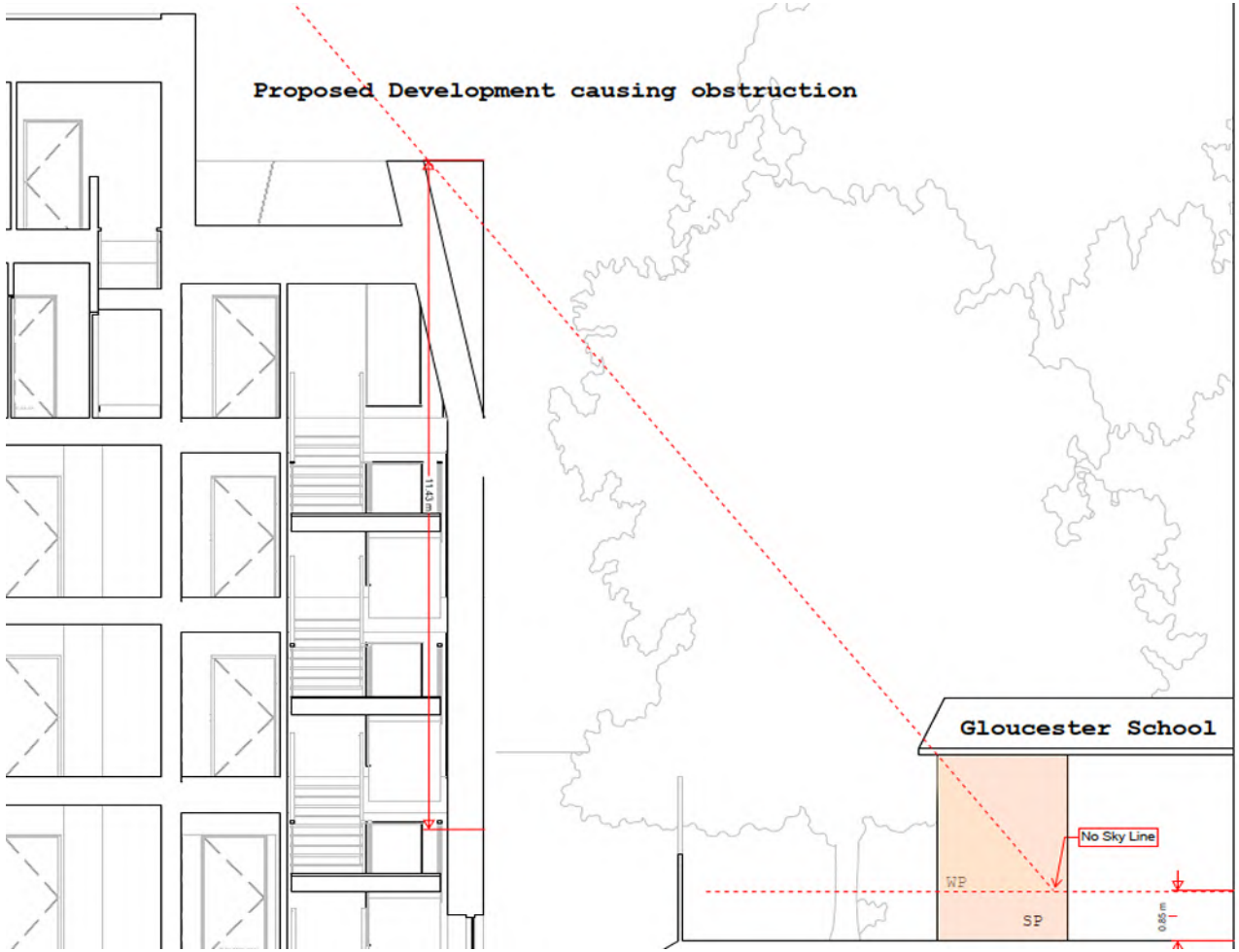
   Area of the room that can “see” the sky= 5.08sqm (40% of total room area)



31 Daleham Gardens

App G- No Skyline Components

Skyline for Gloucester School



APPENDIX H

mes buildingsolutions
Part of the FOCUS consultancy group

Internal Daylight Report
31 Daleham Gardens

11th july 2023

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Newark Beacon, Beacon Hill Office Park,
Cafferata Way, Newark, Notts, NG24 2TN.
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Birmingham B1 2HF.
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Internal Daylight Report

Daylight Levels in Proposed Development

Client: Altair Ltd.

Project: 31 Daleham Gardens, London, NW3 5BU

Date: 11th July 2023

Authors: Chris Jones, BEng (Hons) MSc.

Andrew Pickersgill BSC (Hons), AssocRICS

About *MES Building Solutions*

***MES Building Solutions* is an established consultancy practice specialising in providing building solutions throughout the UK.**

We offer a full range of services for both residential and commercial buildings from small individual properties through to highly complex mixed use developments.

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

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

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

About the Authors

Chris Jones is the Technical Director at *MES Building Solutions*. Chris has a Masters Degree in Energy Efficient & Sustainable Building, as well as an Honours degree in Mechanical Engineering. Chris has over 20 years' experience in providing sustainable building solutions and assists the Neighbourly Matters team at MES. He undertakes daylighting, sunlight and shadow cast analysis for planning applications. Chris is also a qualified BREEAM assessor and has worked with some of the UK's top developers, as well as housing associations and local authorities.

Andrew Pickersgill is an Associate member of the Royal Institution of Chartered Surveyors and leads our neighbourly matters team. He has a BSc (Hons) degree in Building Surveying. Andrew undertakes daylighting, sunlight and shadow analysis for planning applications. He is also involved in party wall issues and carries out other building surveying services for our clients.

List of contents

Section 1: Executive Summary

Following a request from the planning officer, we have assessed the expected amount of natural daylight and sunlight in two habitable, lower ground floor rooms in the proposed redevelopment of 31 Daleham Gardens, London, NW3 5BU and compared the results to the recognised BRE guidance figures.

Calculations were undertaken in accordance with the BRE planning guidance following the procedures detailed Site Layout Planning for Daylight & Sunlight (SLPDS), PJ Littlefair et al 2022 and BS EN 17037-2018 Daylight in Buildings.

The result of our analysis shows that both lower ground floor habitable rooms meet the BRE planning guidance for daylight and sunlight provision.

Therefore, in our opinion, the dwelling will achieve an effective and balanced level of daylight provision that is fully compliant with the BRE planning guidance for daylight and sunlight in new residential properties.

Section 2: Introduction

The purpose of this report is to assess the natural daylight and sunlight levels in two habitable, lower ground floor rooms in the proposed redevelopment of 31 Daleham Gardens, London, NW3 5BU.

This report considers the daylight issues against the criteria set out for national guidance in the following publications:

- Site Layout Planning for Daylight & Sunlight (SLPDS), PJ Littlefair et al 2022 published by the Building Research Establishment (BRE).

  The SLPDS is the culmination of research undertaken by the BRE to determine whether or not a new development will achieve acceptable levels of internal daylight and sunlight. The BRE tests and are widely used by local authorities when deciding on development applications.

- BS EN 17037-2018 Daylight in Buildings.

There are no minimum mandatory requirements for daylighting in Building Regulations for England & Wales, but the guidance set out in SLPDS is widely accepted as the approved methodology when calculating light levels in habitable rooms.

Section 3: Assessment Process

The guidance states that rooms to be assessed should be living rooms, kitchens and bedrooms in residential properties. In non-domestic buildings rooms where occupants 'have a reasonable expectation of daylight' should be assessed. Although these spaces are not defined, examples are given of the type of non-domestic buildings that would normally fall into this category. These include schools, hospitals, hotels and hostels, small workshops and some offices.

It is important to note that the numerical values in the guidance are purely advisory and different criteria may be used based on the requirements for daylighting in an area viewed against other site layout constraints.

The parameters we have assessed are:

- Spatial Daylight Autonomy (SDA)
- Sunlight Exposure (SE)

A room reference plan of the spaces we have assessed can be found in Appendix 1.

Section 4: Daylight Provision:

Daylight Factor

Illuminance (Spatial Daylight Autonomy)

This method involves using climatic data for the location of the site (via the use of an appropriate typical or average year, weather file within the software) to calculate the illuminance from daylight at each point on an assessment grid on the reference plane at an at least hourly interval for a typical year.

The UK National Annex gives illuminance recommendations of 100 lux in bedrooms, 150 lux in living rooms and 200 lux in kitchens. These are the median illuminances, to be exceeded over at least 50% of the assessment points in the room for at least half of the daylight hours.

Other non-habitable rooms need not be assessed.

The calculation of Daylight Provision takes into account the following variables:

- The diffuse visible transmittance of the glazing (we have assumed a figure of 0.68 for double glazing).
- Maintenance factor, allowing for the effects of dirt (we have assumed a figure of 0.76).
- Net glazed area of the window. (we have assumed a figure of 0.8).
- Total area of the room surfaces.
- Surface Reflectance should represent real conditions. Where reflectance values have not been measured or specified, default values to be used in the calculation are given in Table C4.

Table C4 – Recommended default surface reflectance	
Surface	**Default reflectance**
Interior walls	0.5
Ceilings	0.7
Floors	0.2
Exterior walls and obstructions	0.3
Exterior ground	0.2

- Assessment grid: The calculation of illuminance or daylight factor is carried out on a grid of points on a reference plane within each room assessed. The plane is normally 0.85m from the floor level (sometimes described as the working plane height). The standard states that the assessment grid should exclude a band of 0.5m from the walls, unless otherwise specified. In dwellings it is recommended that a band of 0.3m should be excluded, to avoid excluding parts of the room that are used by the occupants.

Results

Calculations were undertaken in accordance with the procedures shown in SLPDS. Our results show that both lower ground floor habitable rooms meet the BRE planning guidance for daylight in new residential buildings, with Spatial Daylight Autonomy results in compliance with the guidelines contained in BS EN 17037-2018 Daylight in Buildings.

Please see Appendix 2 for the detailed results.

Section 5: Sulight Exposure:

The BRE guidance states that access to sunlight can be quantified. BS EN 17037[1] recommends that a space should receive a minimum of 1.5 hours of direct sunlight on a selected date between 1st February and 21st March with cloudless conditions. It is suggested that 21st March (equinox) be used.

The medium level of recommendation is three hours and the high level of recommendation four hours.

For dwellings, at least one habitable room, preferably a main living room, should meet at least the minimum criterion.

Results

Calculations were undertaken in accordance with the procedures detailed in SLPDS. Our results show that both lower ground floor habitable rooms meet the BRE planning guidance for sunlight in new residential buildings achieving Sunlight Exposure levels of at least the minimum standard recommended.

Please see Appendix 2 for the detailed results.

Section 6: Notes

This report has been prepared for the sole use of the Client. No representation or warranty (expressed or implied) is given to any other parties. Therefore this report should not be relied upon by any third party and we accept no liability from the use of this report by any other party.

Our calculations have been undertaken by using date obtained from a site visit, 3D laser scan survey, photographic evidence & OS data along with the drawing numbers below, supplied by Mole Architects Ltd:

2102-PL-E-010-PP1 Existing Site Plan
2102-PL-L-100-PP1 Proposed Site Plan
2102-PL-A-999-PP1 Proposed Lower Ground Floor
2102-PL-A-2000-PP1 Section A
2102-PL-A-2001-PP1 Section 1 Long Section
2102-PL-A-3000-PP1 Proposed South Elevation
2102-PL-A-3001-PP1 Proposed East Elevation
2102-PL-A-3002-PP1 Proposed North Elevation
2102-PL-A-3003-PP1 Proposed West Elevation

We are not aware of any conflicts of interest between ourselves and any other party concerning this project.

Appendix 1: Room Layouts

NOTES

NO.	REVISON	DATE
A	-	-
B	-	-
C	-	-
D	-	-

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CLIENT
Altair LTD

PROJECT
31 Daleham Gardens
Camden
London
NW3 5BU

DRAWING TITLE
Lower Ground Floor Plan
Option 3

DRAWN BY	CHECKED BY
NJW	CJ

DATE	DRAWING NO.
09/02/2023	-

SCALE
NTS

Appendix 2: Full Results Spreadsheets

MES Building Solutions Spatial Daylight Autonomy
Project: 31 Daleham Gardens
Date of Analysis: 21/02/2023

								Criteria				
Floor Ref	Room Ref	Room Use	Room Area m2	Effective Area	Median Lux	Area Meeting Target Lux	% of Area Meeting Target Lux	Target Lux	Req % of Effective Area	Req % of Daylight Hours	Daylight Hours	Meets BRE Guidance
31 Daleham Gardens												
ower Groun	R1	Bedroom	12.75	8.75	129	5.44	62%	100	50%	50%	4380	YES
	R2	LKD	23.68	17.82	274	10.60	59%	200	50%	50%	4380	YES

MES Building Solutions Sunlight Exposure
Project: 31 Daleham Gardens
Date: 09/02/2023

Floor Ref	Room Ref	Room Use	Window Ref	Window Orientation	Proposed Sunlight Exposure (Hours)	Rating
31 Daleham Gardens						
Lower Ground	R1	Bedroom	W1	189°	2.8	
					2.8	Minimum
Lower Ground	R2	LKD	W2	189°	4.6	
			W3	263°	2.1	
			W4	263°	2	
					5	High

APPENDIX I

App I- Window Maps

Gloucester School

Figure 01: Site Image of Gloucester School (South Elevation)

Figure 02: Site Image of Gloucester School (East Elevation)

App I- Window Maps

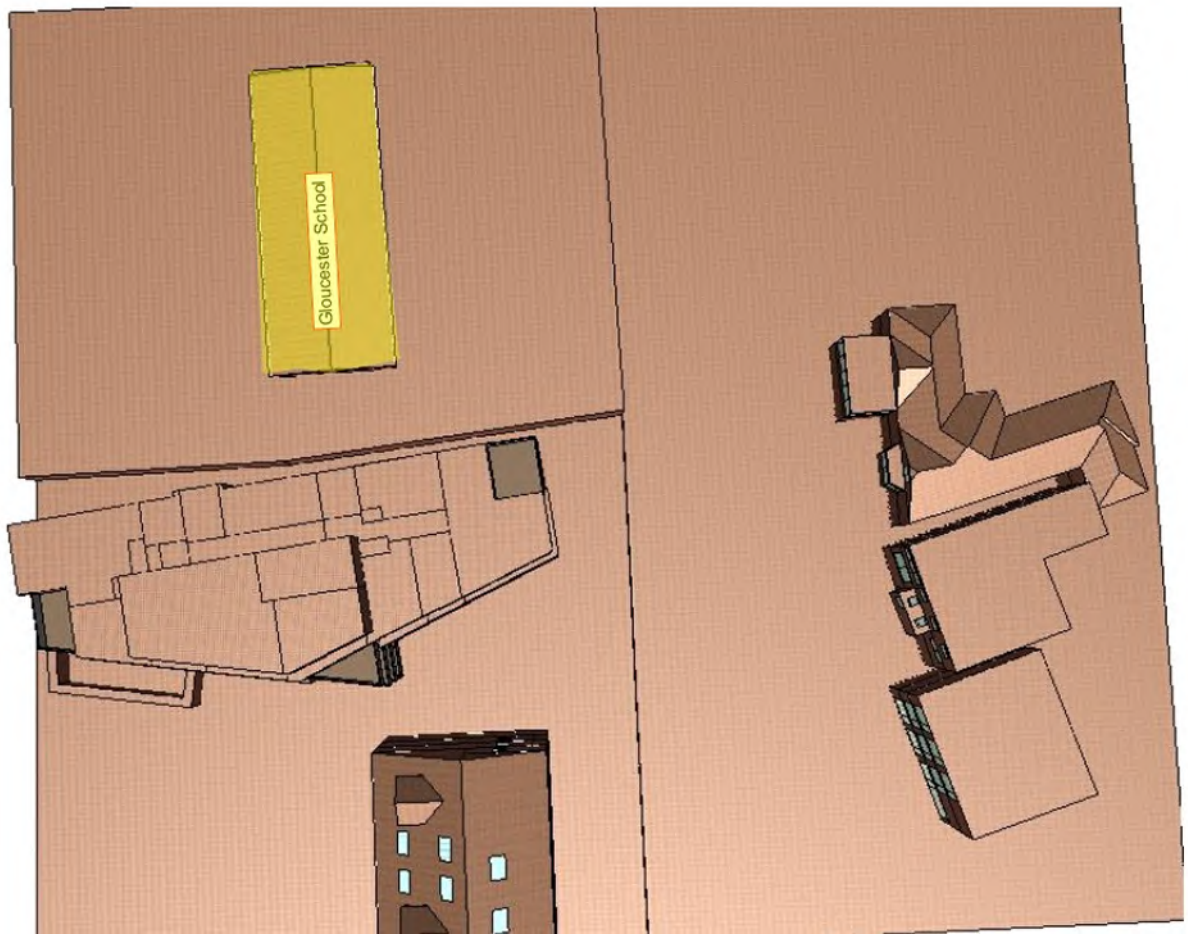

Figure 03: Property Location

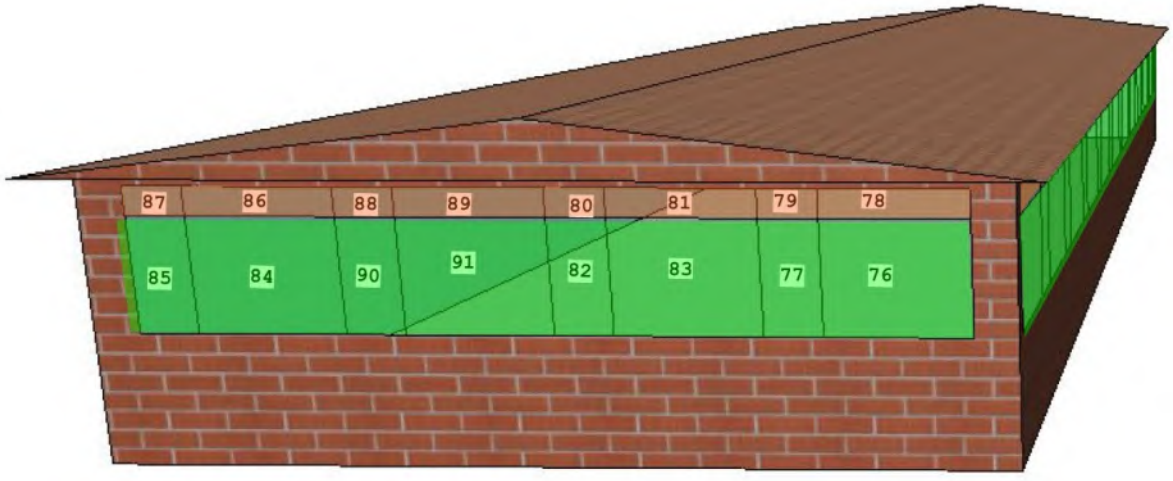

Figure 04: Window Maps of Gloucester School (South Elevation)

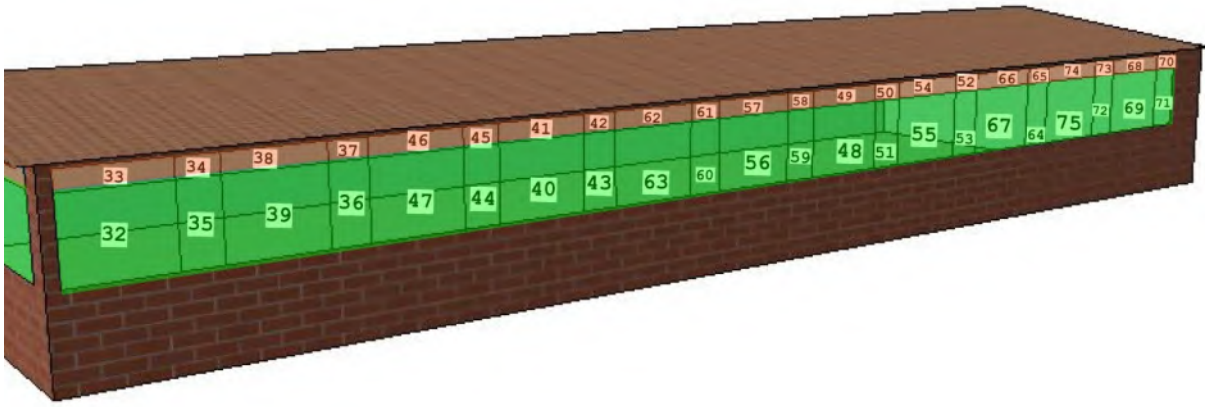

Figure 05: Window Maps of Gloucester School (East Elevation)

App I- Window Maps

32,32A & 32B

Figure 06: Site Images of 32, 32A and 32B Daleham Gardens (East location)

Figure 07: Site Images of 32 (East location)

Figure 08: Site Images of 32 (East location)

App I- Window Maps

32 Daleham Gardens

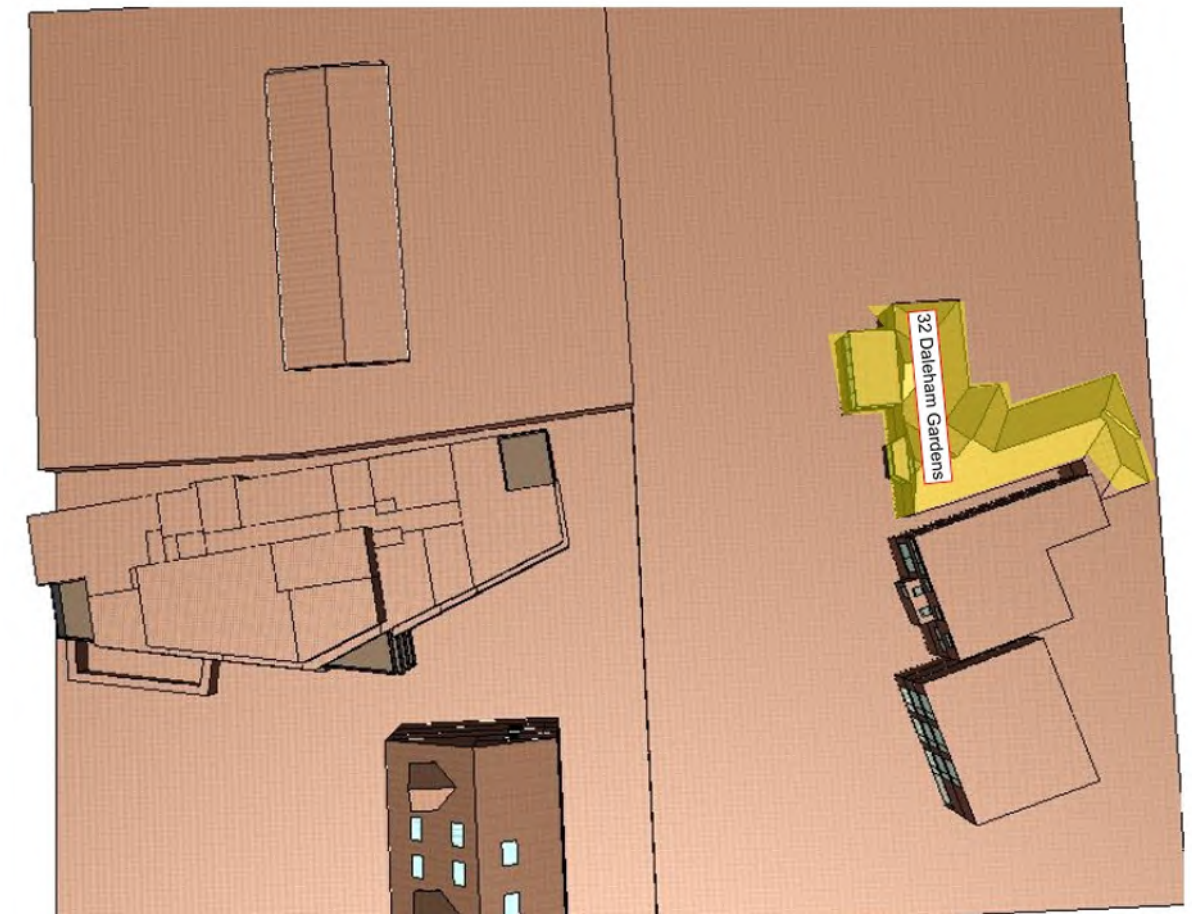

Figure 09: Property Location

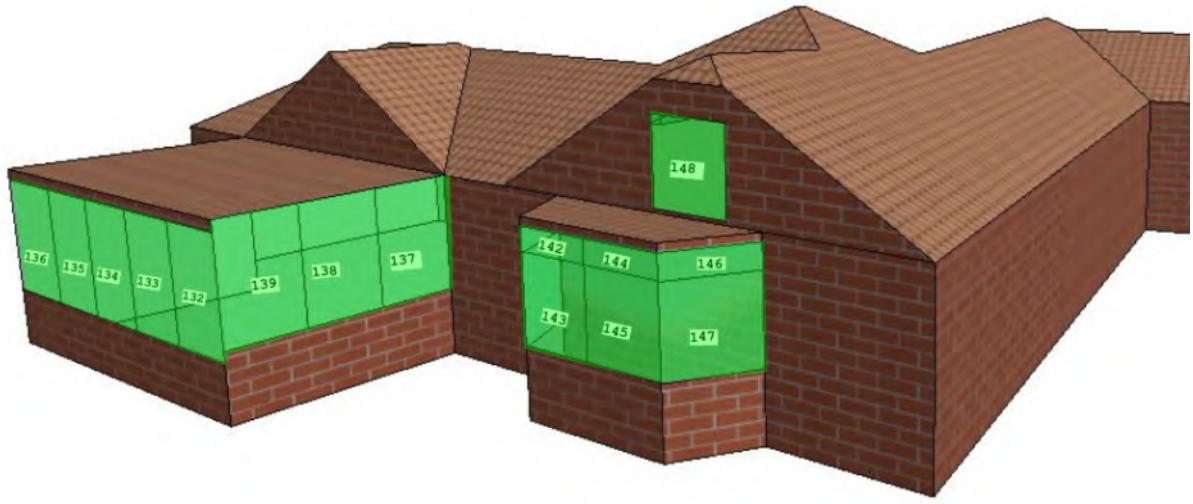

Figure 10: Window Maps of 32 Daleham Gardens (East Elevation)

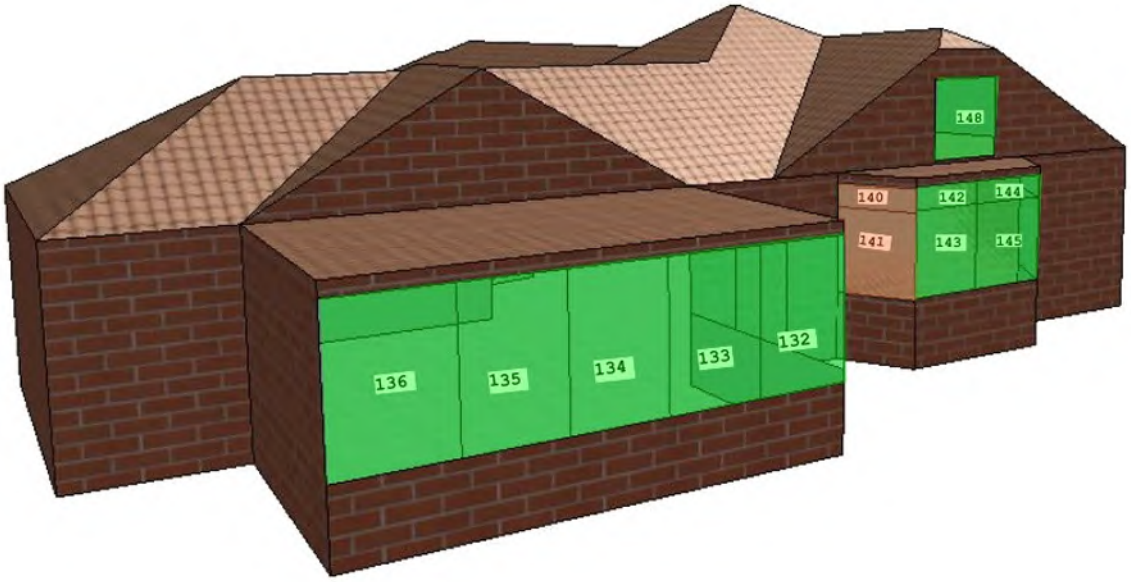

Figure 11: Window Maps of 32 Daleham Gardens (West Elevation)

App I- Window Maps

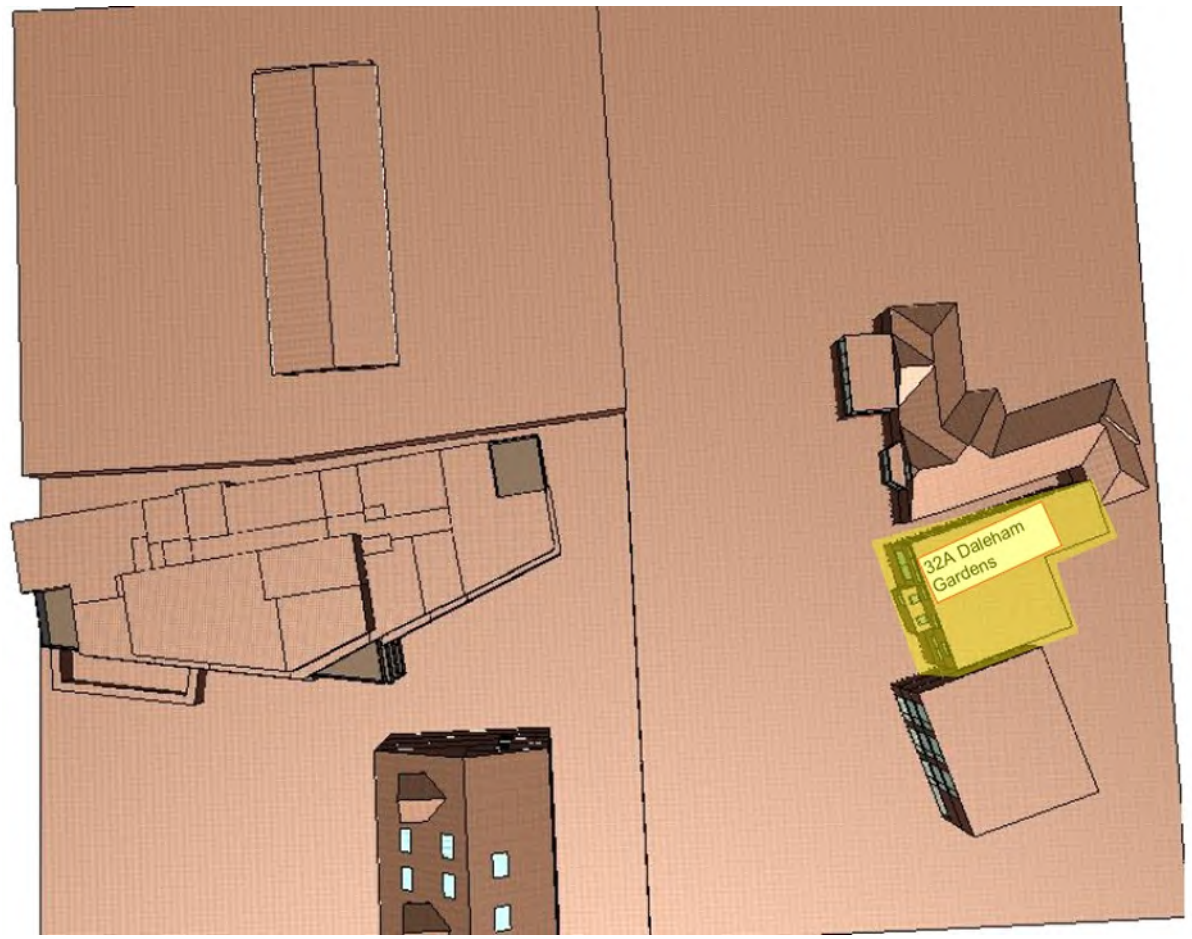

Figure 12: Property Location

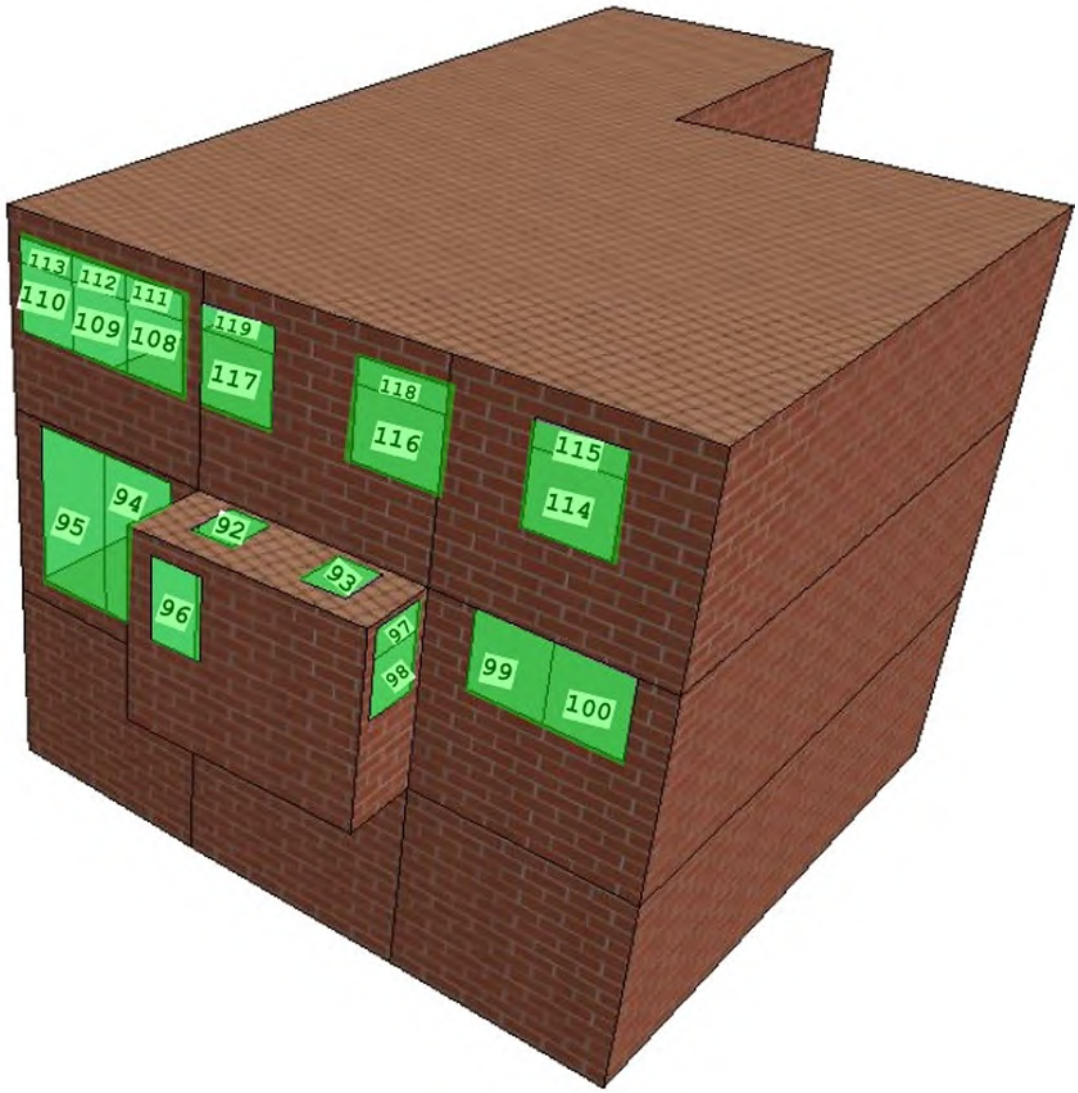

Figure 13: Window Maps of 32A Daleham Gardens (West Elevation)

App I- Window Maps

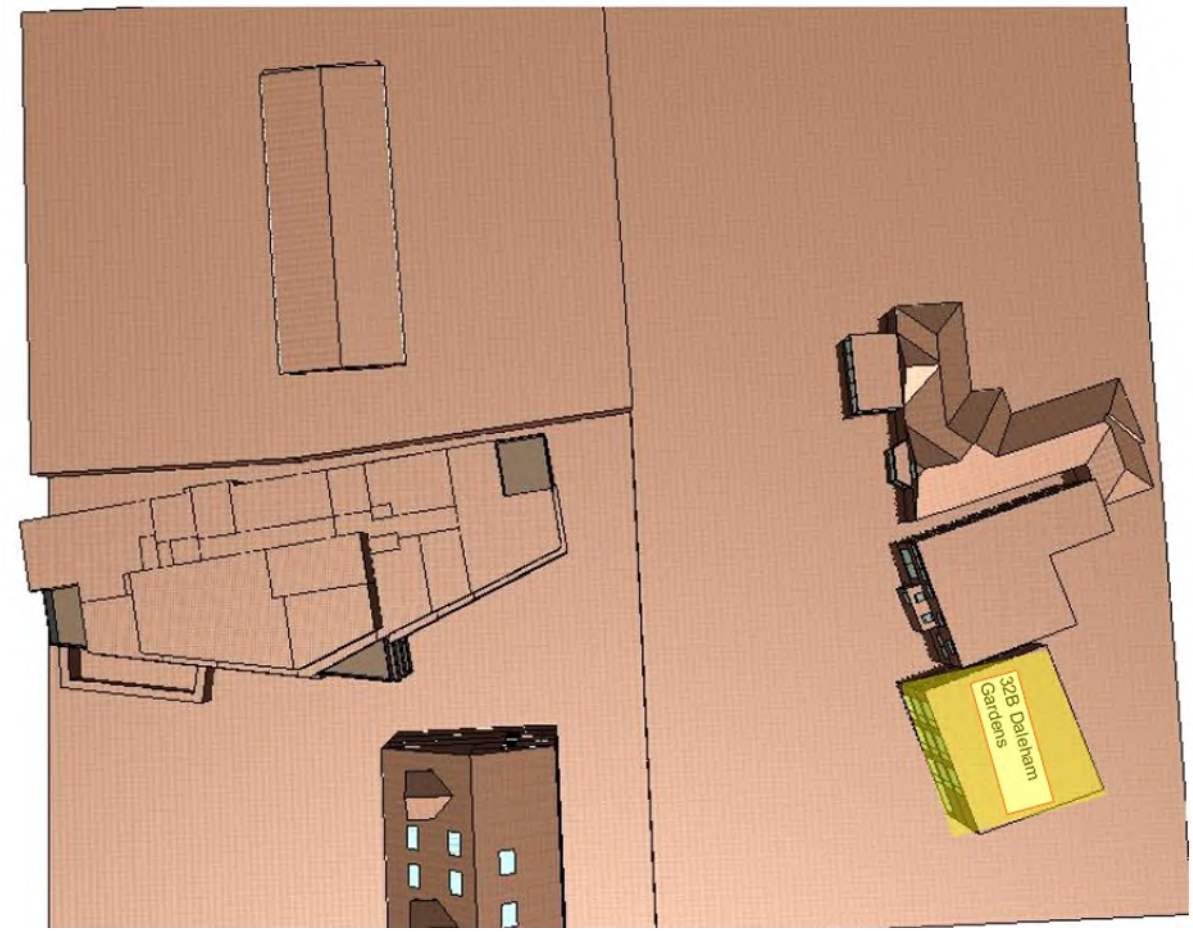

Figure 14: Property Location

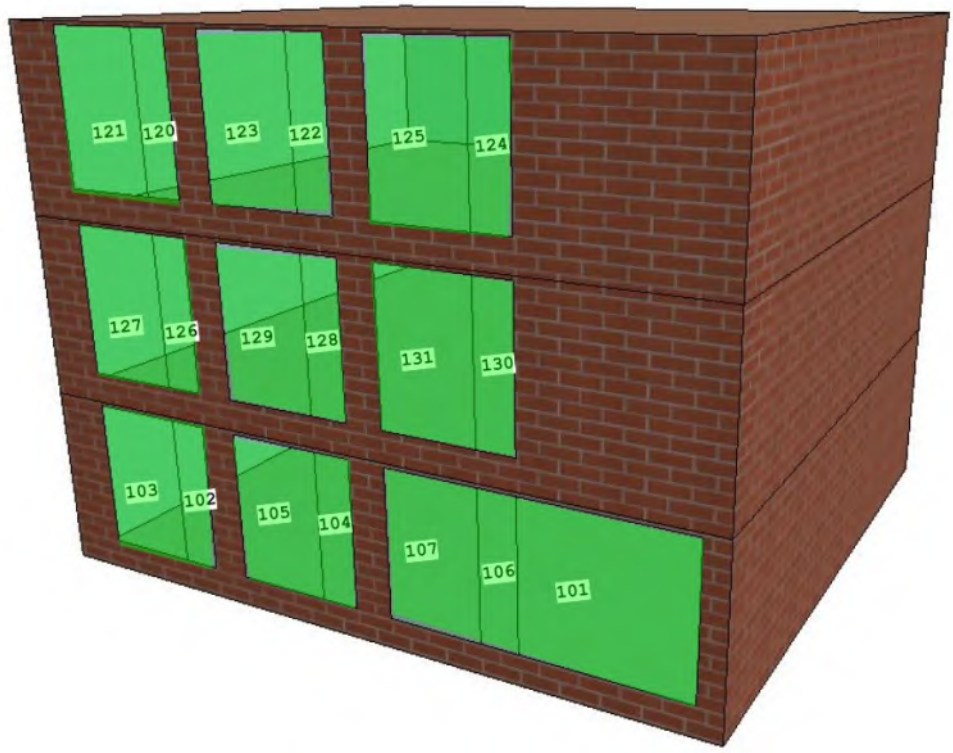

Figure 15: Window Maps of 32B Daleham Gardens (West Elevation)

App I- Window Maps

31A Daleham Gardens

Figure 16: Site Image of 31A Daleham Gardens (North Elevation)

Figure 17: Site Image of 31A Daleham Gardens (West Elevation)

App I- Window Maps

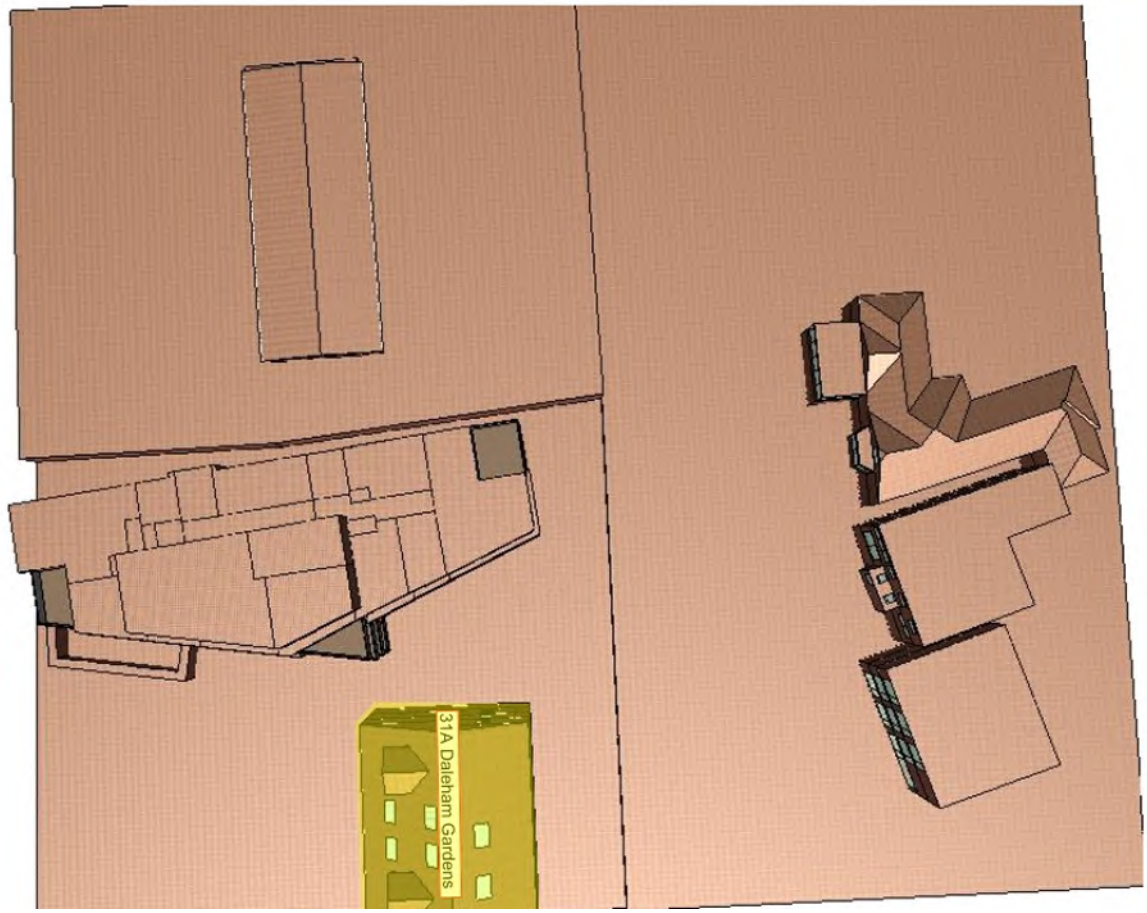

Figure 18: Property Location

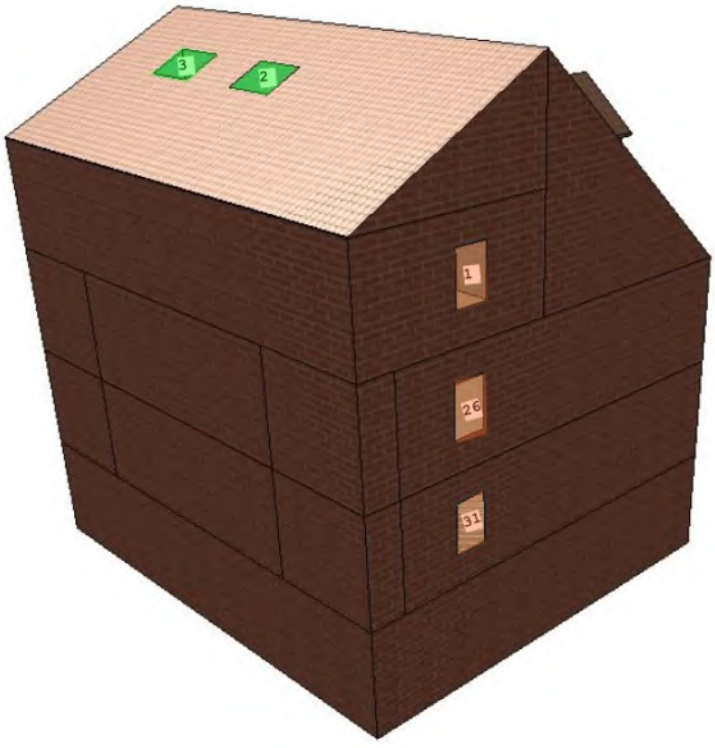

Fig 19: Window Maps of 31A Daleham Gardens (North Elevation)

Figure 20: Window Maps of 31A Daleham Gardens (West Elevation)