DAYLIGHT & SUNLIGHT ASSESSMENT

MARCH 2023, REF: 2318/DSA

CLIENT:
Arthur O'Donnell

SITE ADDRESS:
62 Church Road
Teddington
TW11 8EY

CONTENTS:

AUTHOR:

William Pottinger

REVISIONS:
None

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:hello@thedaylightlab.co.uk

1. Who We Are

The Daylight Lab work closely with architects, designers and private clients throughout the UK, assisting with daylight and sunlight matters related to architecture and planning. We take a proactive approach, engaging with all parties involved and providing input throughout the design process, to ensure that sites reach their fullest potential while ensuring neighbouring amenity is not unduly impacted.

Any enquiries, including requests for copies of 3D models for cross-examination, should be directed to hello@thedaylightlab.co.uk.

2. Executive Summary

The proposed single storey side/rear extension at No.62 Church road will cause no undue loss of daylight or sunlight to neighbouring properties and meets relevant BRE guidelines.

The Daylight Lab therefore support the scheme with regard to daylight and sunlight matters.

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3. Introduction & Site Description

This report has been commissioned by Arthur O'Donnell and prepared by The Daylight Lab to assess the impact of the proposed single storey side/rear extension at No.62 Church Road on the levels of daylight and sunlight enjoyed by neighbouring properties.

The existing site comprises a semi-detached 2 storey family dwelling with rear garden. The front/street elevation of the property faces approximately west-south-west.

Neighbouring to the north is No.64 Church Road, essentially a mirror image of No.62 but with an existing timber frame and polycarbonate side infill extension (see Figure 2 on Page 4).

It is proposed to construct a flat roofed side infill and rear extension at No.62 to provide improved living accommodation.

A planning application is ongoing, reference 23/0223/HOT, and an objection has been lodged by the owners of No.64, raising concerns that the proposal may lead to loss of daylight and sunlight to their property, which this report seeks to address.

Copies of the existing and proposed application drawings referred to in this study, prepared by Studio Elephant Architects, can be found in Appendix 1.

Fig 1. Location Plan. North to top. Do not scale.

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Fig 2. As existing aerial view of rear of No.62 (centre) and No.64 (right).

4. Summary of Applicable Policy

The methods used in this report are based on the BRE's "Site layout planning for daylight and sunlight: A guide to good practice", third edition, 2022 (as updated in June of this year), which is generally accepted as good practice by local planning authorities in the UK.

It is important to note that the advice given in the guide *"is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design"* (page 7, paragraph 1.6).

In addition to the BRE guidance, attention is given to the National Planning Policy Framework (NPPF), July 2021. Specifically, paragraph 125 which states; *"when considering applications for housing, authorities should take a flexible approach in applying policies or guidance relating to daylight and sunlight, where they would otherwise inhibit making efficient use of a site (as long as the resulting scheme would provide adequate living standards)."*

5. Key Definitions

It is important to note the key difference between daylight and sunlight. For the purposes of this report, these can be defined as follows:

Daylight

Daylight is the combination of all direct and indirect sunlight (see following definition of sunlight) during the daytime. This includes direct sunlight, diffuse sky radiation, and (often) both of these reflected by Earth and terrestrial objects, like landforms and buildings.

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Sunlight
Sunlight is direct light that reaches Earth on an uninterrupted path from the sun.

6. Methodology
As existing and as proposed 3D models of the site and surroundings were prepared by The Daylight Lab to a level of detail suitable for testing, based on drawing information provided by Studio Elephant Architects (copies of which can be found in Appendix 1), along with OS data and photographs.

Due to the unusual nature of the existing infill extension at No.64, being fully glazed with polycarbonate sheeting and therefore allowing natural light to pass through largely unobstructed to the original house behind, the model was tested in two parts. Firstly, tests were made to the polycarbonate roof to investigate potential loss of light within the extension. Secondly, tests were carried out to the original window openings running along the original rear and side facing external brick walls to investigate potential loss of light to the original house within. Because the position and dimensions of the side facing window openings are obscured from view by the translucent polycarbonate sheeting, a series of regular test points were set up along that wall. See figures 11 and 12 for further clarification.

If a copy of the model is required for cross-examination, please email a request to: hello@thedaylightlab.co.uk.

Tests were then carried out in accordance with relevant BRE guidelines, using the following methods of measurement and specialist analysis software (MBS Daylight):

Daylight - Vertical Sky Component (VSC)
The Vertical Sky Component (VSC) is the ratio of the direct sky illuminance falling on a vertical window at a central reference point, to the simultaneous horizontal illuminance under an unobstructed sky. In the case of a floor-to-ceiling window such as a patio door, a point 1.6 m above ground may be used. For a bay window, the centre window facing directly outwards can be taken as the main window. If a room has two or more windows, then an overall VSC can be derived by weighting each VSC element in accordance with the proportion of total glazing area represented by its window.

If the proposed VSC is less than 27%, then a comparison of “before” and “after” levels of VSC need to be calculated. Good daylighting can still be achieved if levels are within 0.8 of their former value.

Living rooms, kitchens and bedrooms need to be analysed but bathrooms, toilets, storerooms, garages and circulation areas do not.

Daylight Distribution – No Sky Line
Where room layouts are known, the impact on the daylight distribution in the existing building can be found by plotting the “no sky line” in each of the main rooms. For houses this would include living rooms, dining rooms and kitchens; bedrooms should also be analysed although they are less important. In non-domestic buildings each main room where daylight is expected should be investigated. The no sky line divides points on the working plane which can and cannot see the sky (in houses the working plane is 0.85m high and offices 0.7m high). Areas beyond the no sky line usually look dark and gloomy compared with the rest of the room.

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If, following construction of a new development, the no sky line moves so that the area of the existing room, which does receive direct skylight, is reduced to less than 0.80 times its former value this will be noticeable to the occupants, and more of the room will appear poorly lit.

Sunlight - Annual Probable Sunlight Hours (APSH)

A dwelling or any non-domestic building where there is a particular requirement for sunlight will appear reasonably sunlit provided that at least one main window to a living room (or a commercial space which is deemed to have a special requirement for sunlight) faces within 90° of due south and receives at least 25% of the annual probable sunlight hours (APSH), including at least 5% during the winter (WPSH), between the 21st of September and 21st of March. APSH refers to the total number of hours in the year that the sun is expected to shine on unobstructed ground, allowing for average levels of cloudiness for the location in question (in this case the data used was for the Greater London area).

If as a result of a proposal an applicable neighbouring window receives less than 25% of APSH or 5% WPSH, either figure is less than 0.8 times of its former value and there is a reduction in APSH greater than 4% then sun lighting will be adversely affected.

Sunlight - Overshadowing of Amenity Space

The availability of sunlight in open spaces such as rear gardens can be checked by analysing the overshadowing that results from a proposal. BRE recommend that at least half of the amenity area should receive at least two hours of sunlight on 21 March. If as a result of new development an existing garden or amenity area does not meet the above, and the area which can receive two hours of sun on 21 March is less than 0.8 times its former value, then the loss of sunlight is likely to be noticeable.

7. 3D Model & Reference Images

The following figures 3-16 show the existing and proposed 3D models as tested.

Specifically:

- Figures 3-10 provide external views of the existing and proposed site and surrounding context.
- Figures 11-15 provide neighbouring window references for those tested for loss of light.
- Figures 16 provides neighbouring amenity area references for those tested for loss of light.

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Fig 3. Aerial view of existing 3D model from south.

Fig 4. Aerial view of existing 3D model from west.

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Fig 5. Aerial view of existing 3D model from north.

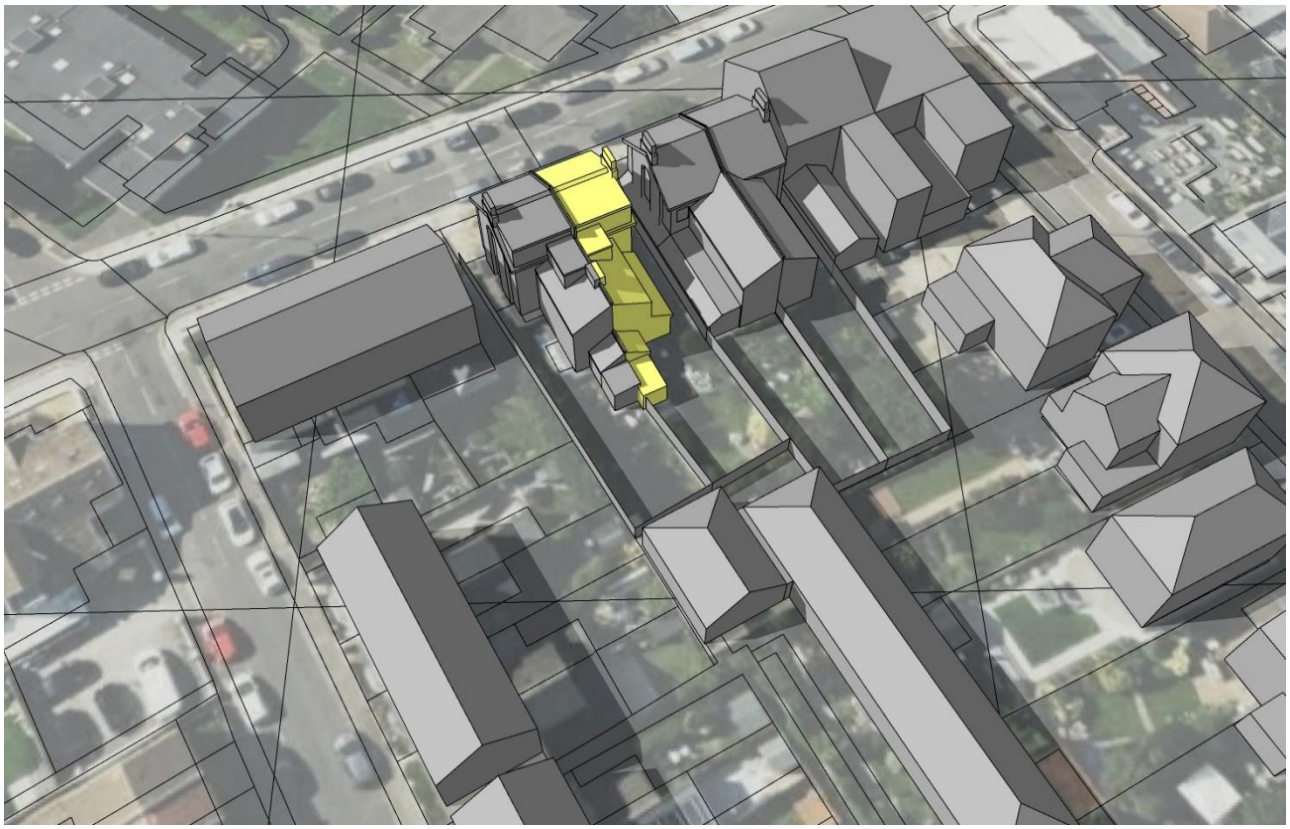

Fig 6. Aerial view of existing 3D model from east.

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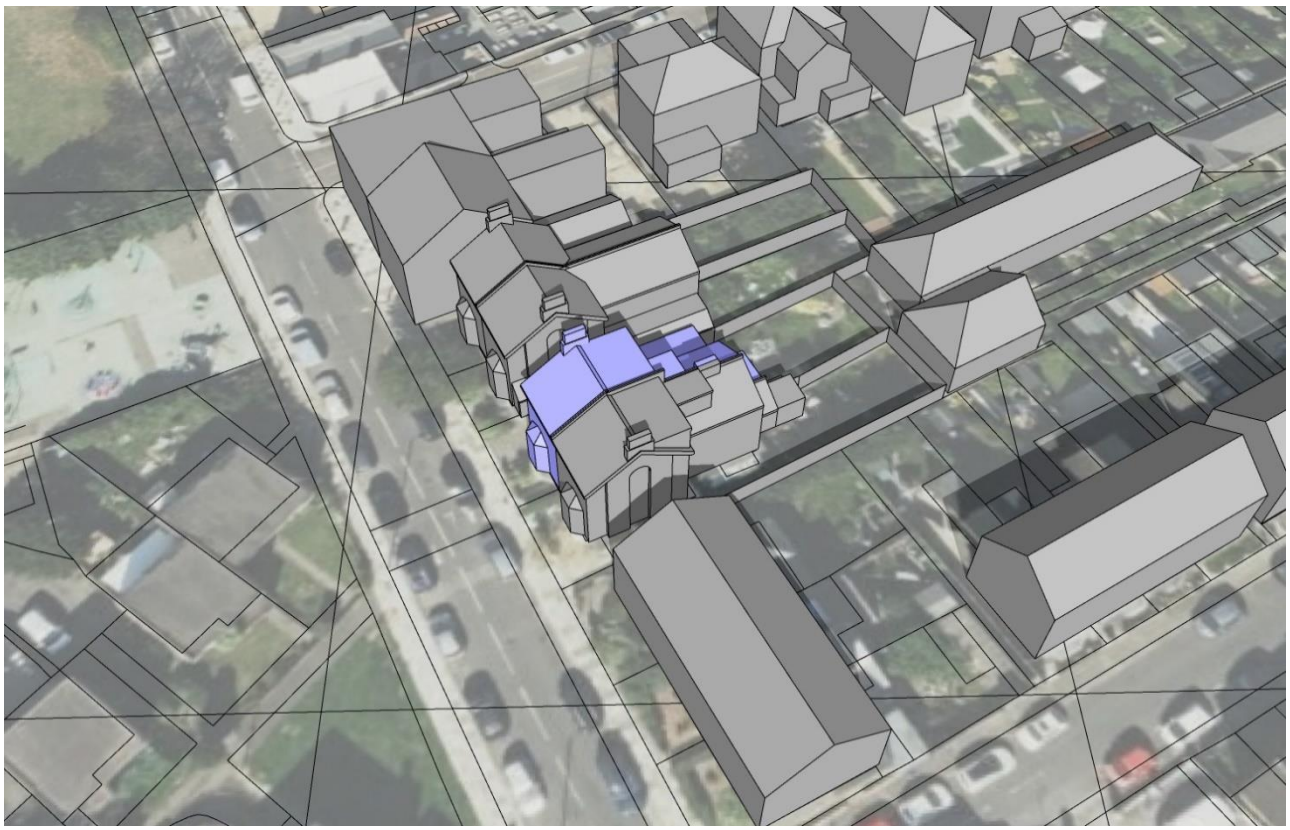

Fig 7. Aerial view of proposed 3D model from south.

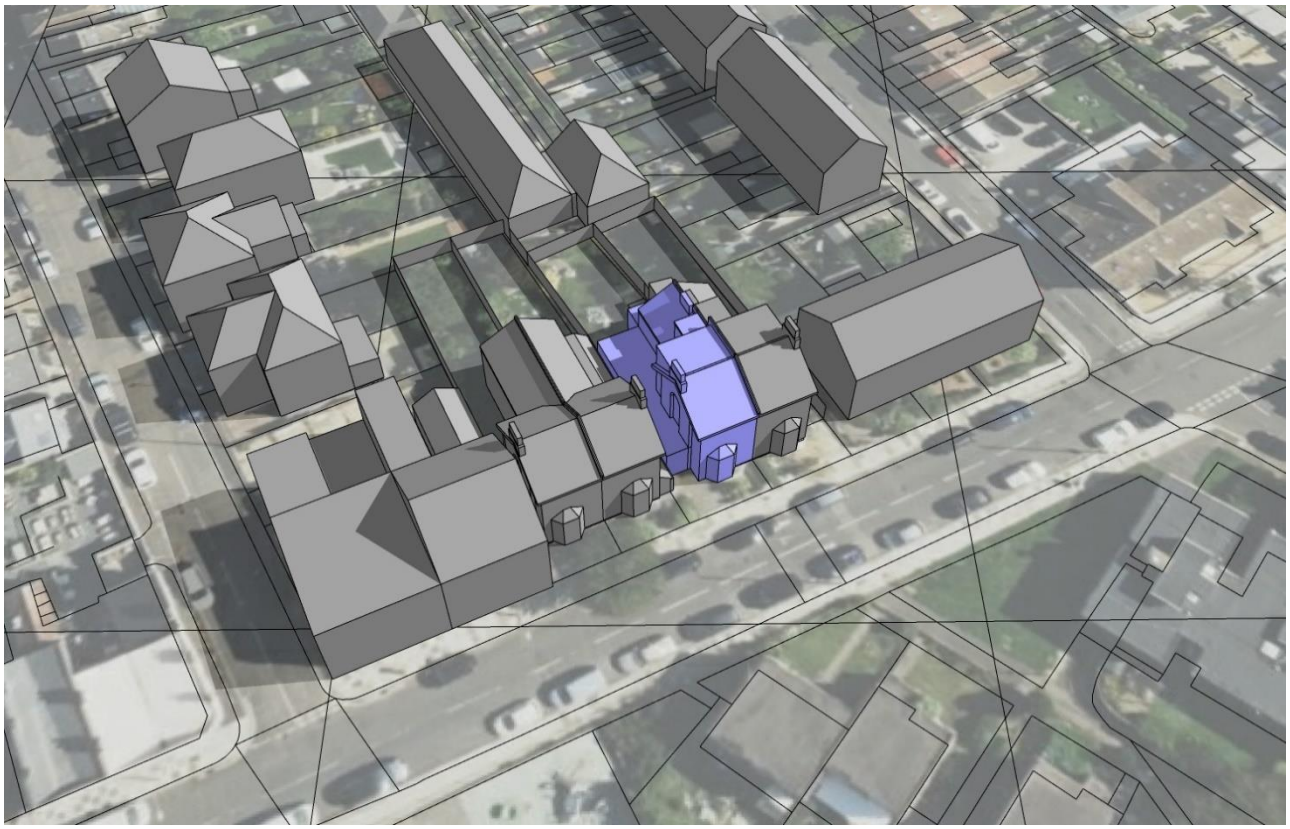

Fig 8. Aerial view of proposed 3D model from west.

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Fig 9. Aerial view of proposed 3D model from north.

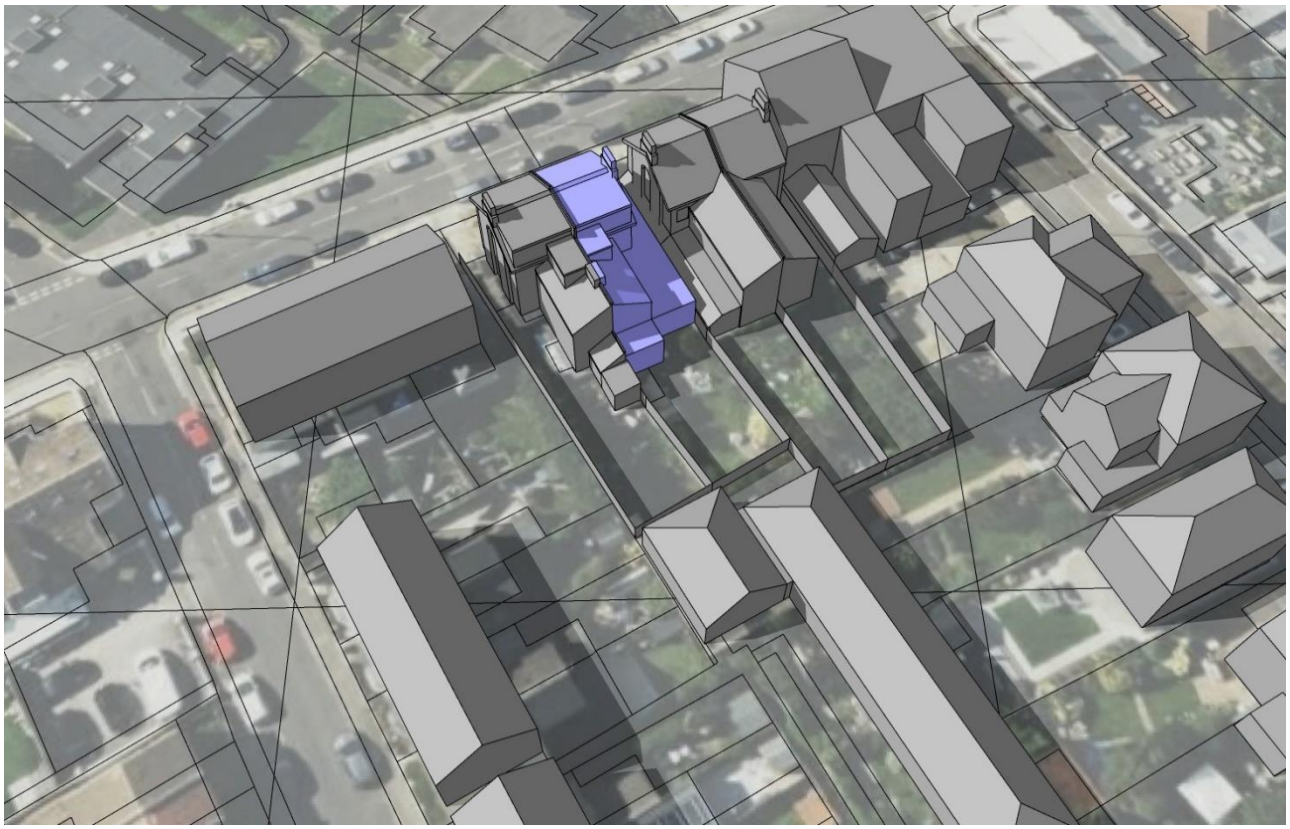

Fig 10. Aerial view of proposed 3D model from east.

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t:07521 606980, e:hello@thedaylightlab.co.uk

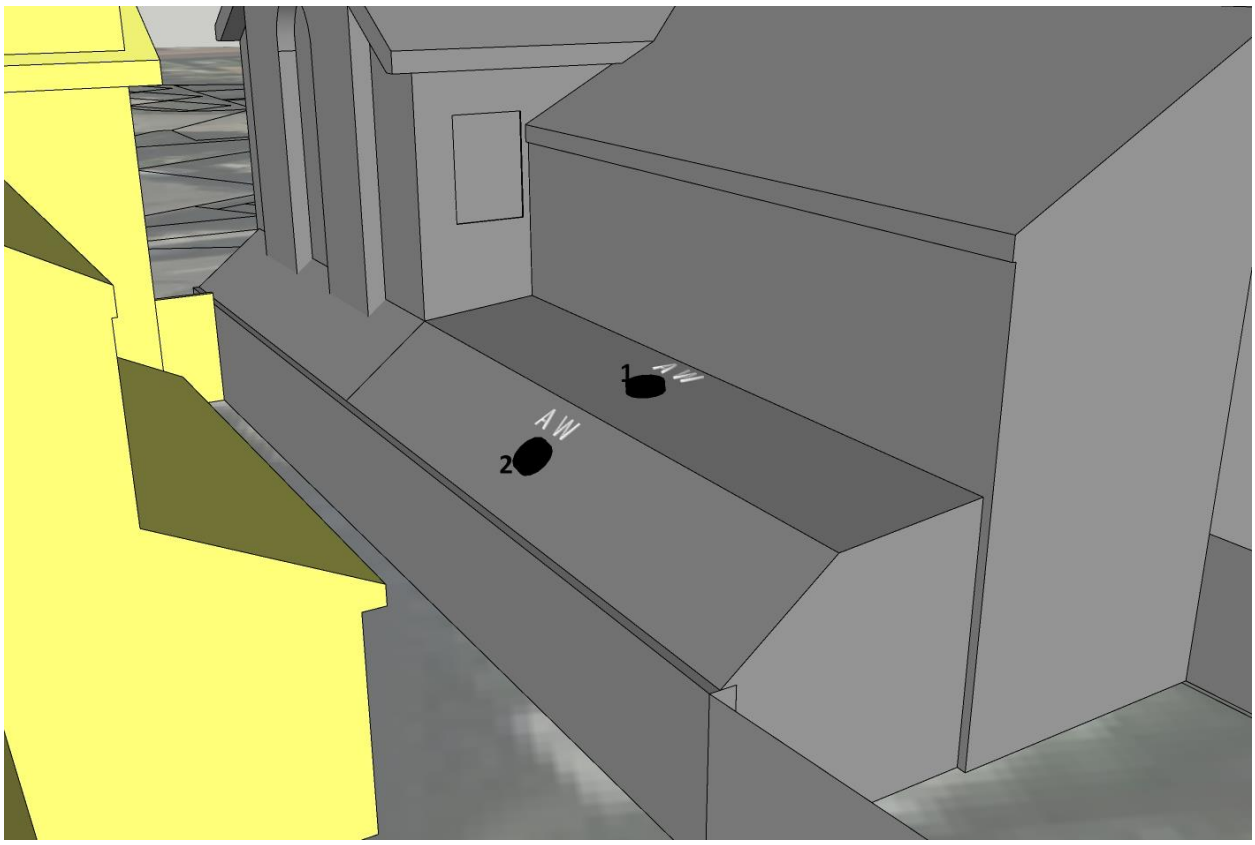

Fig 11. Rear/side view of No.64 with test points for polycarbonate roof indicated.

Fig 12. Rear/side view of No.64 with polycarbonate infill extension removed to show internal test points for existing windows within (note that positions of windows 4, 5, 6 and 7 are assumed due to lack of reliable survey information).

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Fig 13. Aerial view with neighbouring amenity area at No.64 tested for loss of sunlight labelled. North to top.

8. Results

Test results are listed below, with a traffic light system of green, amber, and red, to indicate "pass", "borderline" or "fail".

Any results that require further calculations or explanation are marked with an asterisk. Additional information is then provided as appropriate.

Daylight - Vertical Sky Component (VSC)

The following table compares existing and proposed VSC results for neighbouring windows that might be affected by the proposal. Corresponding Waldram Diagrams can be found in Appendix 2.

Table 1. VSC results.

Property	Room	Window ref	Vsc Ex (%)	Vsc Prop (%)	Pr/Ex
64 Church Road	Unknown	1	61.36	61.35	1
64 Church Road	Unknown	2	62.11	51.58	0.83
64 Church Road	Unknown	3	18.41	17.41	0.95
64 Church Road	Unknown	4	16.38	15.64	0.95
64 Church Road	Unknown	5	20.73	19.61	0.95
64 Church Road	Unknown	6	24.41	23.39	0.96
64 Church Road	Unknown	7	27.27	27.16	1

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Daylight – No Sky Line

Neighbouring property layouts were unknown, so tests for change in the no sky line were not conducted, however the excellent VSC results in Table 1 prove that no neighbouring properties shall suffer from a noticeable loss of daylight to their windows or the % of their habitable floor area from which the sky is visible (also see conclusion).

Sunlight - Annual Probable Sunlight Hours (APSH/WPSH)

The following table compares existing and proposed APSH/WPSH results for any neighbouring windows that face within 90° of due south and might be affected by the proposal.

Please note that only principal living room windows need testing under BRE guidelines, but as room types were unknown all have been included.

Table 2. Annual and winter sunlight hours results.

Property	Room Type	Win' ref	Win' Orienta-tion	Ex APSH (%)	Prop APSH (%)	Pr /Ex	Ex WPSH (%)	Prop WPSH (%)	Pr /Ex
64 Church Road	Unknown	1	155° Inc	61	61	1	7	7	1
64 Church Road	Unknown	2	155° Inc	51	26	0.51*	2	0	0**
64 Church Road	Unknown	3	65°N	25	24	North	0	0	North
64 Church Road	Unknown	4	155°	36	34	0.94	1	0	0***
64 Church Road	Unknown	5	155°	42	40	0.95	2	0	0***
64 Church Road	Unknown	6	155°	57	55	0.96	8	6	0.75****
64 Church Road	Unknown	7	155°	64	63	0.98	12	11	0.92

*Ratio of existing to proposed APSH is below 0.8, however proposed result remains above 25%, meaning a pass (see methodology).

**The minor loss of WPSH recorded to this test point, on the sloped element of the polycarbonate roof, will be offset by the WPSH enjoyed by the much larger flat roof surface, also polycarbonate (see conclusion).

***Ratio of existing to proposed WPSH is below 0.8, however reduction in APSH is less than 4%, meaning a pass (see methodology).

****Ratio of existing to proposed WPSH is below 0.8, however proposed result is above 5% and reduction in APSH is less than 4%, meaning a pass (see methodology).

Sunlight - Overshadowing of Amenity Space

The following table compares the existing and proposed % area of any neighbouring amenity areas that might be affected by the proposals, that will receive at least two hours of direct sunlight on the 21st of March.

Accompanying gradient diagrams can be found in Appendix 3.

Table 3. Sunlight hours in neighbouring amenity areas results.

Amenity area	Existing % of amenity area that receives 2 hours+ of direct sunlight on the 21st of March	Proposed % of amenity area that receives 2 hours+ of direct sunlight on the 21st of March
No.64 Church Rd rear garden	75.00%	75.00%

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9. Conclusion

Daylight - Vertical Sky Component (VSC)

As illustrated in figures 11 and 12, testing was carried out at No.64 Church Road in two parts. The first was to assess the loss of daylight to the translucent polycarbonate extension roof and the second was to assess the loss of daylight to the original (assumed) window and door openings within. This allowed for an overall picture of daylight loss to be gathered, both within the extension and within the ground floor accommodation of the original house.

All test points above met BRE guidelines for loss of daylight with excellent results, meaning there will be no undue loss of daylight experienced by No.64 Church Road as a result of the proposal.

Daylight results are therefore concluded to be excellent.

Daylight Distribution – No Sky Line

The exact internal layout of No.64 was unknown, other than the open space within the side infill extension area. There was no need to test this space as, regardless of the proposal, the polycarbonate roof means that the sky shall remain visible from its entirety.

Elsewhere, the excellent VSC results in Table 1 prove that none of the habitable rooms within the original house shall suffer from undue loss of daylight to their windows or the % of their habitable floor area from which the sky is visible.

Daylight distribution results are therefore concluded to be excellent.

Sunlight - Annual Probable Sunlight Hours (APSH/WPSH)

As with VSC tests for daylight, testing was carried out in two parts. 6 out of 7 of the tests points returned excellent results. Test point 2 returned poorer results, however this was positioned on the narrow sloped roof element of the polycarbonate extension at No.64 and will be more than offset by the sunlight still enjoyed by its much larger flat roof surface (also polycarbonate).

Overall results therefore met BRE guidelines of sunlight with excellent results, meaning there will be no undue loss of internal sunlight experienced by neighbouring properties as a result of the proposal.

Sunlight results are therefore concluded to be excellent.

Sunlight - Overshadowing of Amenity Space

The neighbouring rear garden at No.64 met BRE guidelines for loss of sunlight with excellent results, recording no loss from existing to proposed, meaning there will be no noticeable loss of external sunlight experienced by No.64 as a result of the proposal.

Closing Statement

The proposal satisfies all relevant BRE and planning policy requirements for daylight and sunlight, with no undue loss of daylight or sunlight experienced by No.64.

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All other neighbouring properties are positioned further away from No.62 than no.64, meaning they too pass BRE requirements by default.

It is therefore concluded that no undue loss of daylight or sunlight will be experienced by neighbouring properties as a result of the proposed single storey side/rear extension at No.62 Church Road, and The Daylight lab offer their full support to the scheme with regards to daylight and sunlight matters.

William Pottinger, The Daylight Lab, March 2023.

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APPENDIX 1

Existing and proposed drawings provided by Studio Elephant Architects.
(not to scale)

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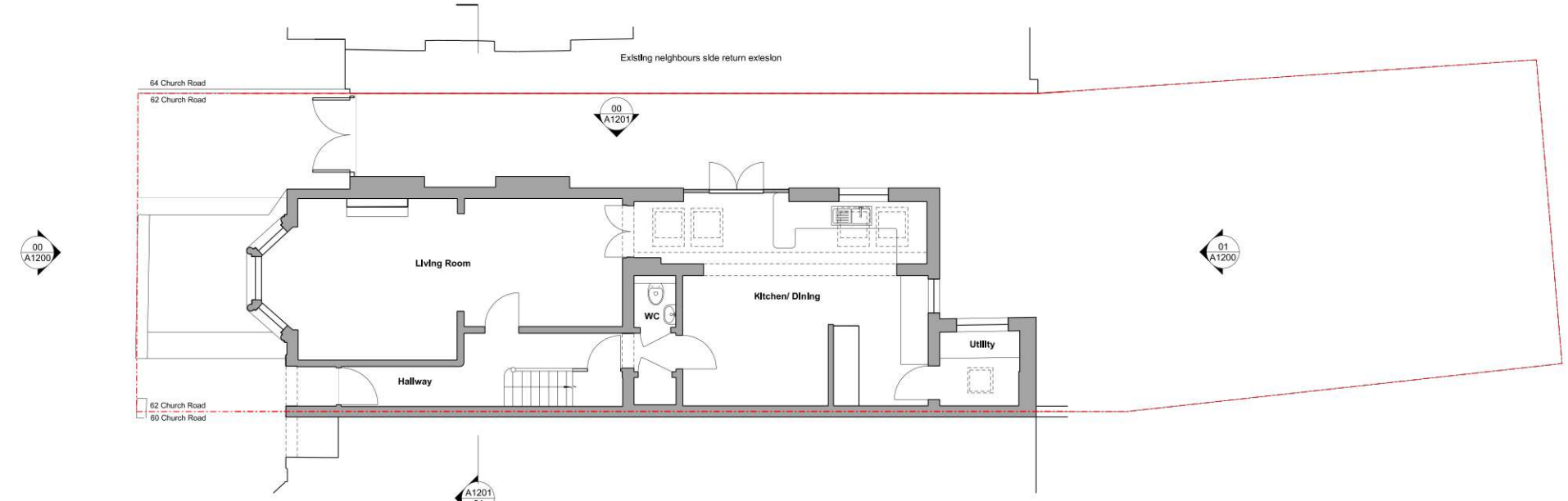
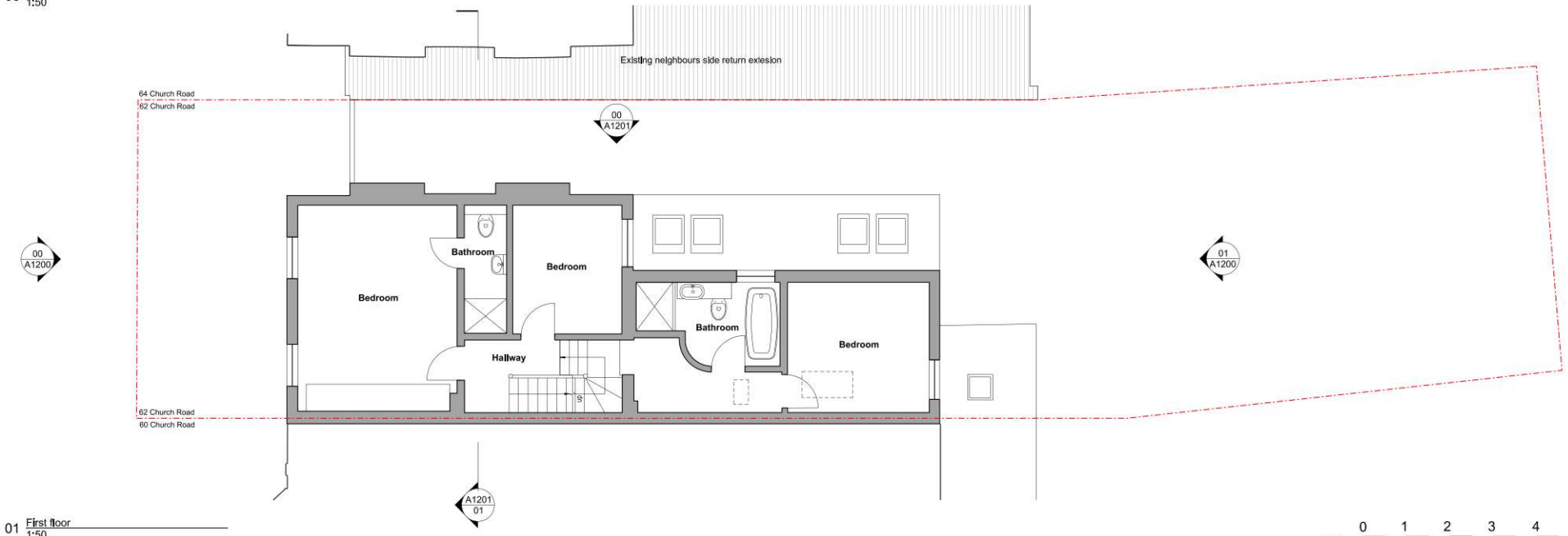


00 Ground floor
1:50



01 First floor
1:50

1:50 0 1 2 3 4 5 Meters

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ARCHITECTS

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REV	Date	Reason For Issue	Chk
P2	11/02/2023	For Planning	GG
P1	23/01/2023	For Planning	GG

REV	Date	Reason For Issue	Chk

For Planning

DRAWING STATUS

Orientation

Keyplan

Client
Mrs A Hainsworth & Mr A O'Donnell

62 Church Road,
Teddington
London
TW11 8EY

Project
62 Church Road

Drawing Title
Existing Plans

Date	Scale at A1	Rev No.	Drawing No.
23.01.23	1:50	P2	P1000

00 Front elevation
1:50

01 Rear elevation
1:50

1:50 0 1 2 3 4 5 Meters

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ARCHITECTS

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REV	Date	Reason For Issue	Chk	REV	Date	Reason For Issue	Chk
P2	11/02/2023	For Planning	GG				
P1	23/01/2023	For Planning	GG				

For Planning

DRAWING STATUS

Orientation

Keyplan

Client
Mrs A Halnsworth & Mr A O'Donnell

62 Church Road,
Teddington
London
TW11 8EY

Project
62 Church Road

Drawing Title
Existing Elevations

Date	Scale at A1	Rev No.	Drawing No.
23.01.23	1:50	P2	P1200

00 Side Elevation
1:50

01 Section A-A
1:50

1:50 0 1 2 3 4 5 Meters

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REV	Date	Reason For Issue	Chk	REV	Date	Reason For Issue	Chk
P2	11/02/2023	For Planning	GG				
P1	23/01/2023	For Planning	GG				

For Planning
DRAWING STATUS

Orientation

Keyplan

Client
Mrs A Halnsworth & Mr A O'Donnell

62 Church Road,
Teddington
London
TW11 8EY

Project
62 Church Road

Drawing Title
Existing Section & Side Elevation

Date	Scale at A1	Rev No.	Drawing No.
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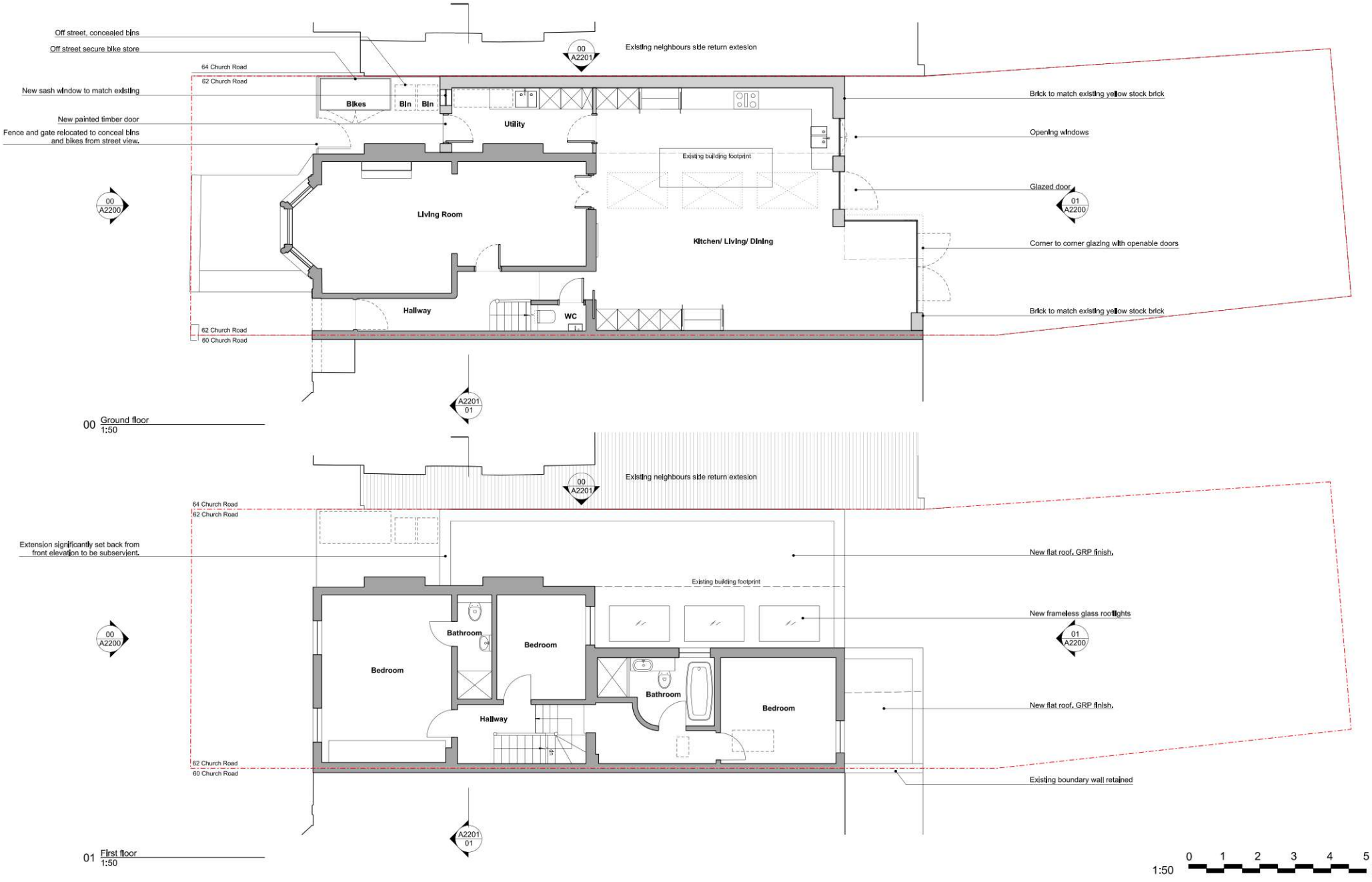

Disclaimer

Studio Elephant Architects takes no responsibility for any dimensions that are obtained by scaling this drawing. If no dimension is given, it is deemed to be the responsibility of the contractor to ascertain the dimension from site measurement before any fabrication takes place.

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REV	Date	Reason For Issue	Chk
P2	11/02/2023	For Planning	GG
P1	23/01/2023	For Planning	GG

REV	Date	Reason For Issue	Chk

For Planning

DRAWING STATUS

Orientation

Keyplan

Client
Mrs A Hainsworth & Mr A O'Donnell

62 Church Road,
Teddington
London
TW11 8EY

Project
62 Church Road

Drawing Title
Proposed Plans

Date	Scale at A1	Rev No.	Drawing No.
23.01.23	1:50	P2	P2000

00 Front elevation with existing gates shown
1:50

01 Front elevation with existing gates hidden to show proposed set back elevation behind
1:50

02 Rear elevation
1:50

1:50 0 1 2 3 4 5 Meters

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ARCHITECTS

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REV	Date	Reason For Issue	Chk	REV	Date	Reason For Issue	Chk
P2	11/02/2023	For Planning	GG				
P1	23/01/2023	For Planning	GG				

For Planning
DRAWING STATUS

Orientation

Keyplan

Client
Mrs A Halnsworth & Mr A O'Donnell

62 Church Road,
Teddington
London
TW11 8EY

Project
62 Church Road

Drawing Title
Proposed Elevations

Date	Scale at A1	Rev No.	Drawing No.
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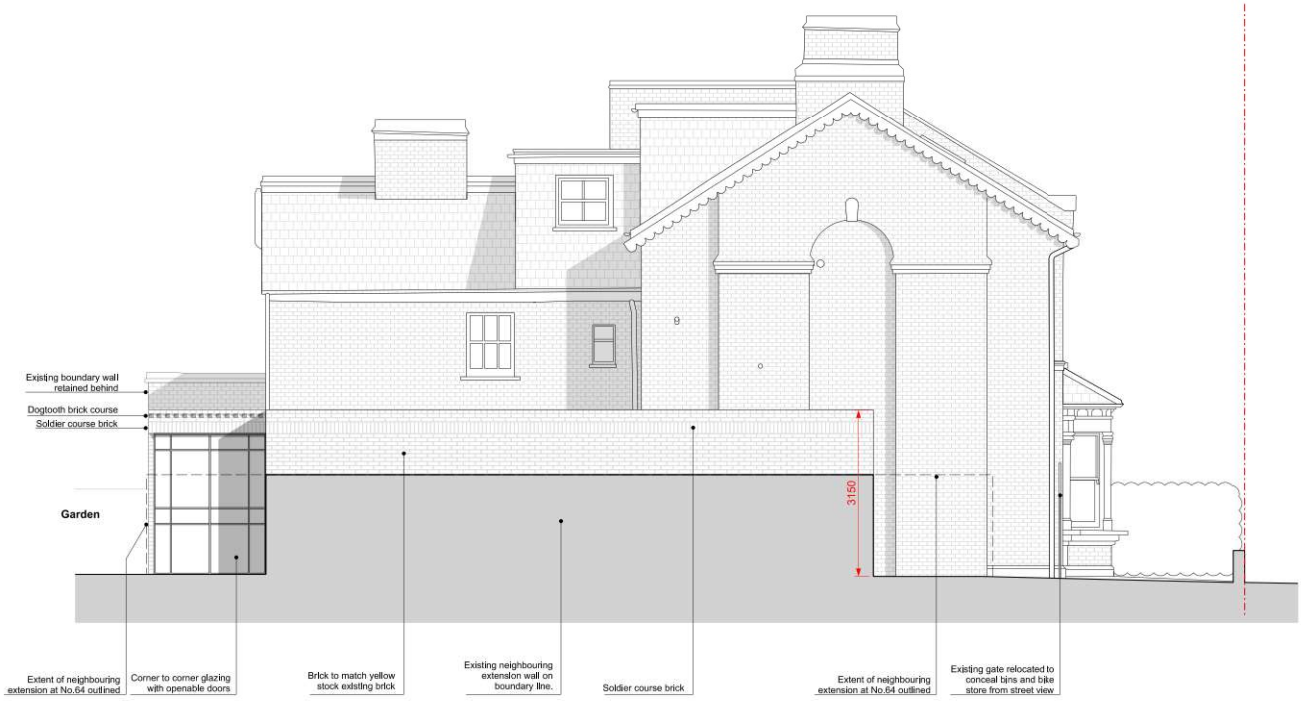
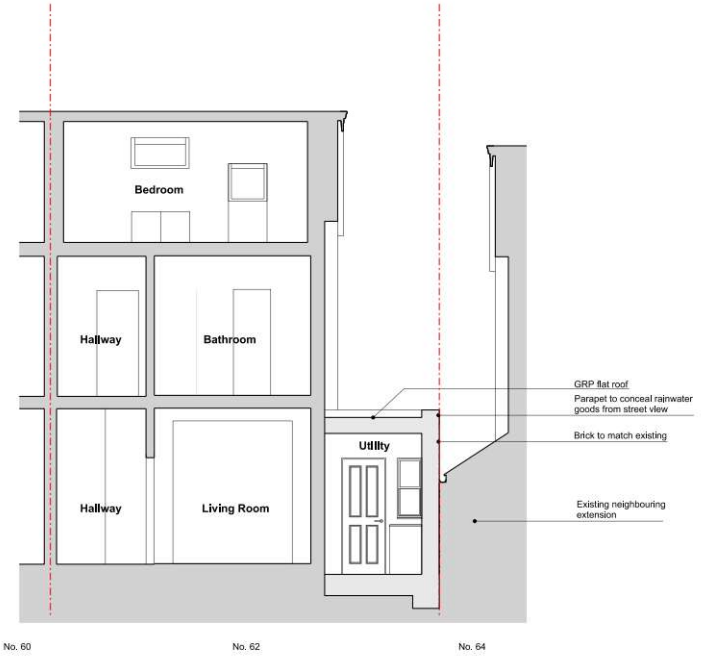


00 Side Elevation
1:50



01 Section A-A
1:50

1:50 0 1 2 3 4 5 Meters

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REV	Date	Reason For Issue	Chk	REV	Date	Reason For Issue	Chk
P2	11/02/2023	For Planning	GG				
P1	23/01/2023	For Planning	GG				

For Planning

DRAWING STATUS

Orientation

Keyplan

Client
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62 Church Road,
Teddington
London
TW11 8EY

Project
62 Church Road

Drawing Title
Proposed Section & Side Elevation

Date	Scale at A1	Rev No.	Drawing No.
23.01.23	1:50	P2	P2201

APPENDIX 2

VSC Waldrum Diagrams for neighbouring windows.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
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NO IMAGE OUTPUTTED FOR NON VERTICAL WINDOWS

Fig 1. Waldram Diagram for Window 1.

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NO IMAGE OUTPUTTED FOR NON VERTICAL WINDOWS

Fig 2. Waldram Diagram for Window 2.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:hello@thedaylightlab.co.uk

Drawing Ref: 62 Church Road Window Ref: 64 Church Road__W3__3	VSC	Existing: 18.41 Proposed: 17.41

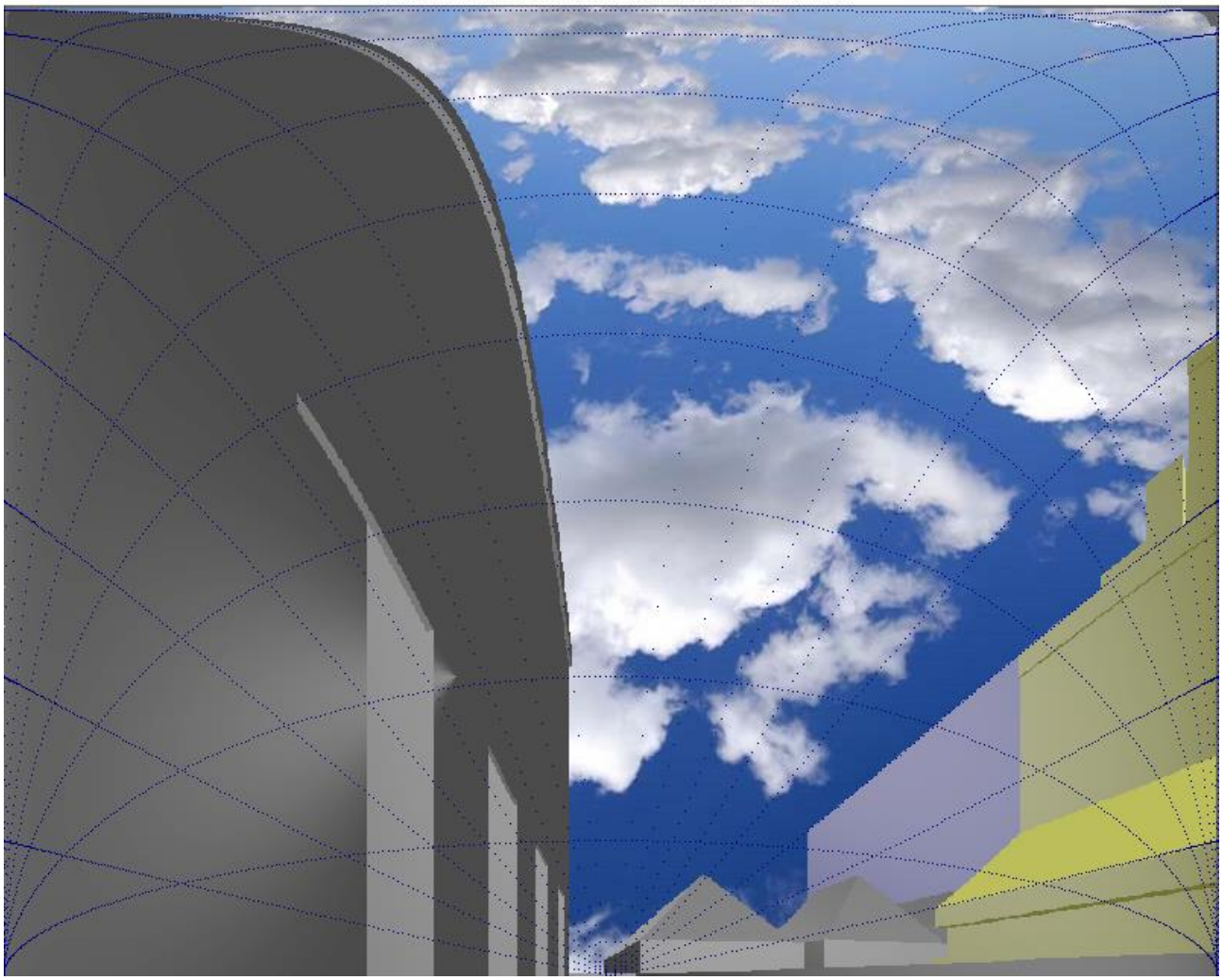

Fig 3. Waldram Diagram for Window 3.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
t:07521 606980, e:hello@thedaylightlab.co.uk

Drawing Ref: 62 Church Road Window Ref: 64 Church Road__W4__4	VSC	Existing: 16.38 Proposed: 15.64

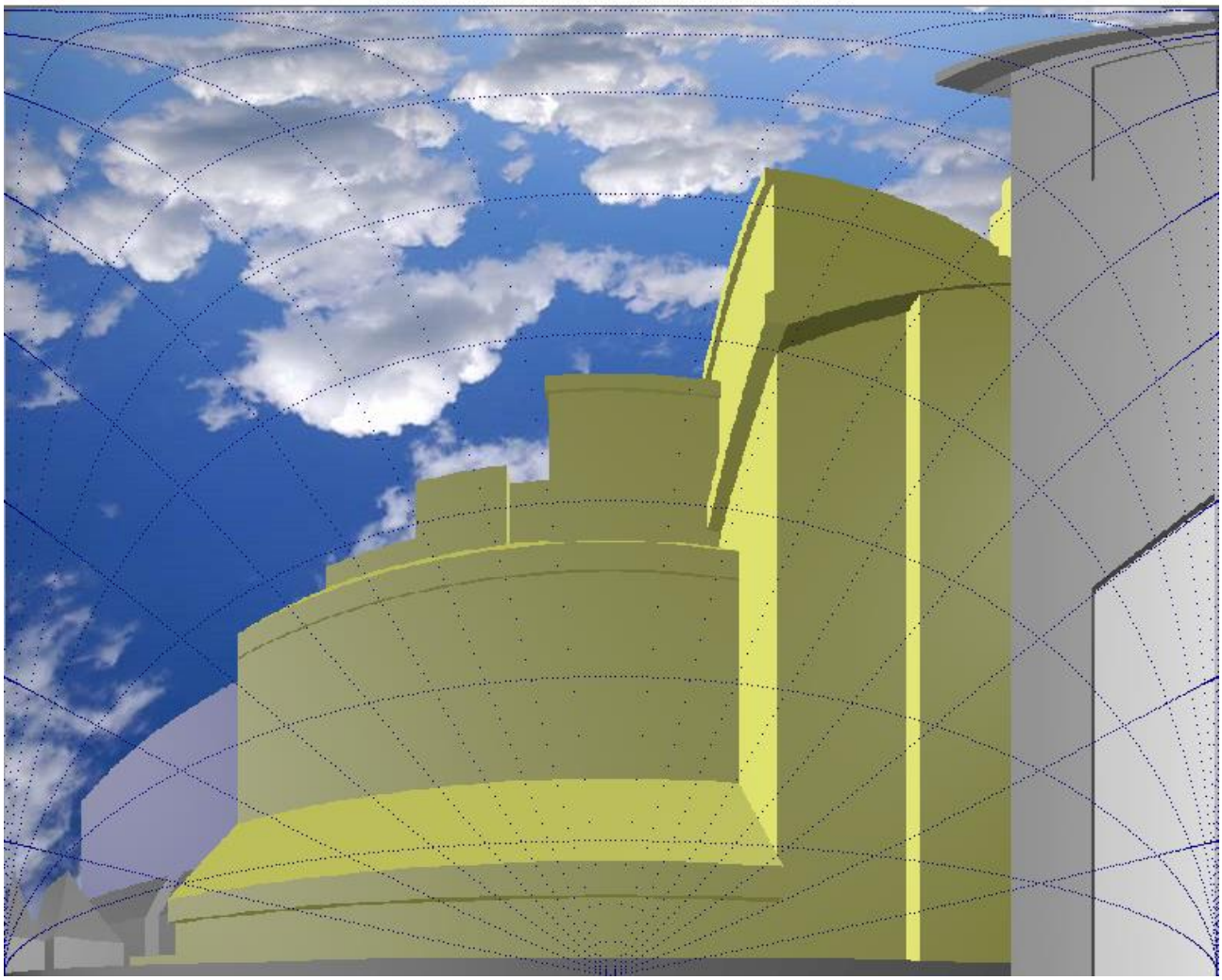

Fig 4. Waldram Diagram for Window 4.

The Daylight Lab, 66 Hardres Street, Ramsgate, Kent CT11 8QP
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Drawing Ref: 62 Church Road Window Ref: 64 Church Road__W5__5	VSC	Existing: 20.73 Proposed: 19.61

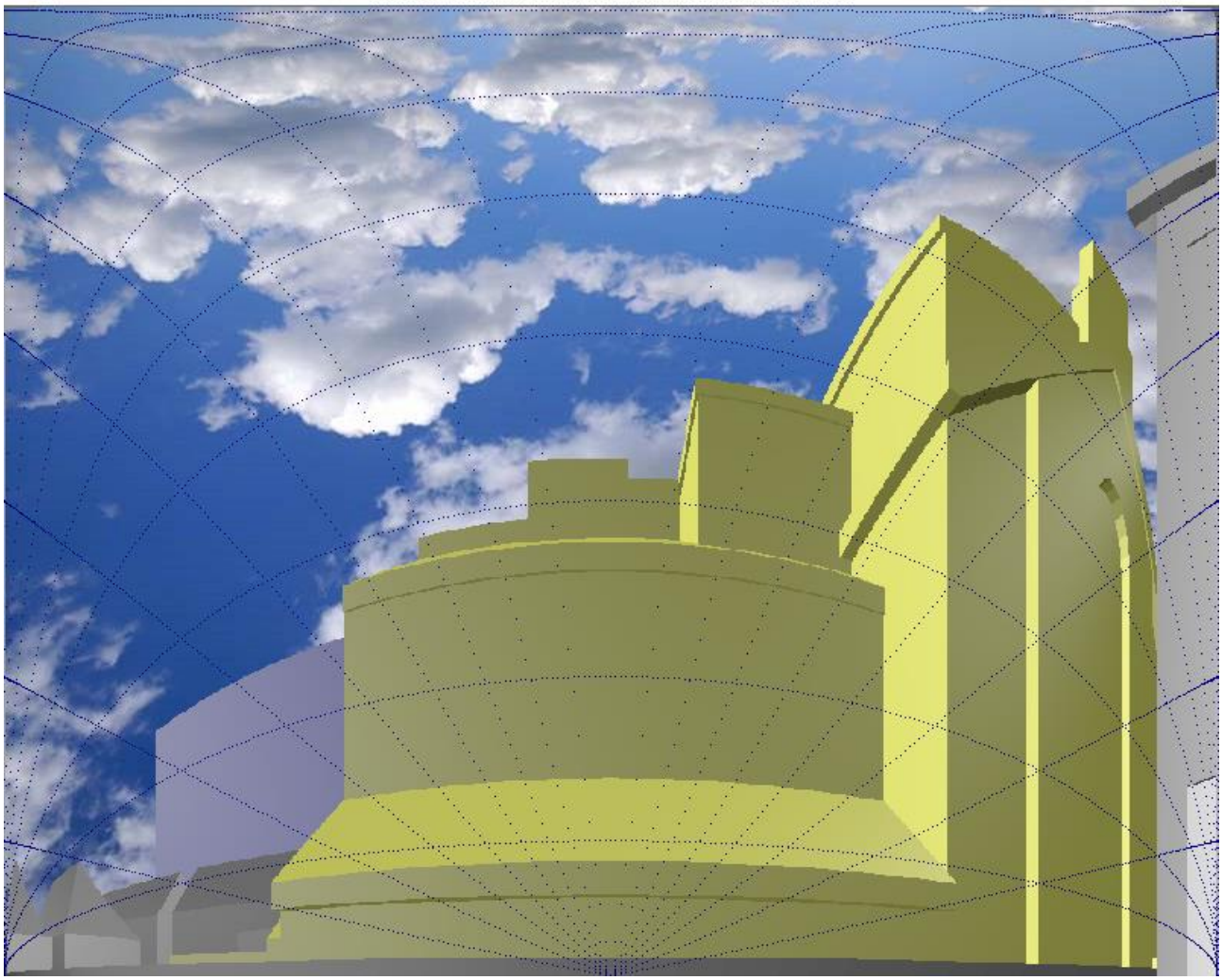

Fig 5. Waldram Diagram for Window 5.

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Drawing Ref: 62 Church Road Window Ref: 64 Church Road__W6__6	VSC	Existing: 24.41 Proposed: 23.39

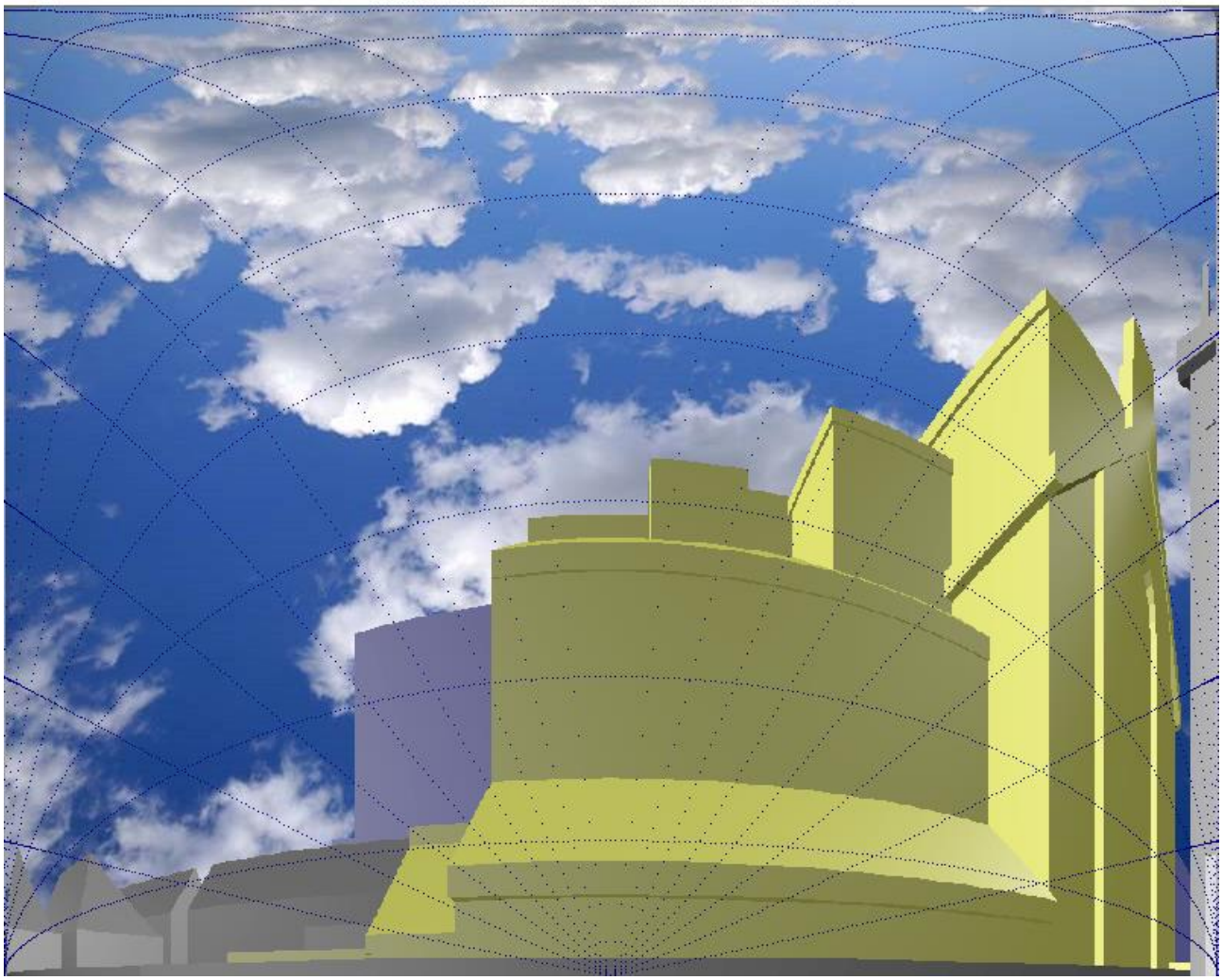

Fig 6. Waldram Diagram for Window 6.

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Drawing Ref: 62 Church Road Window Ref: 64 Church Road__W7__7	VSC	Existing: 27.27 Proposed: 27.16

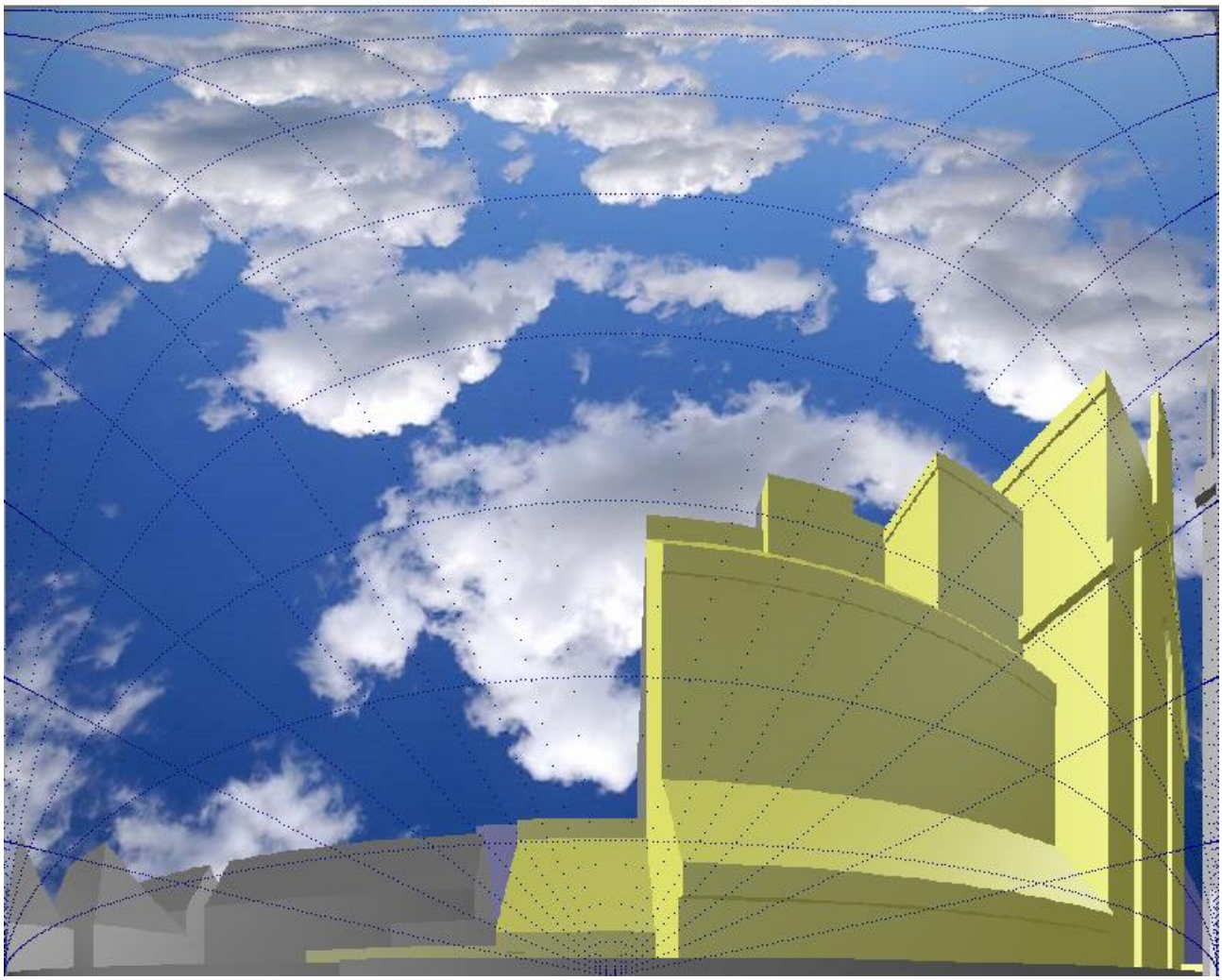

Fig 7. Waldram Diagram for Window 7.

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APPENDIX 3

Neighbouring Amenity Areas – Sunlight Hours Gradient Maps on 21st March 12pm.

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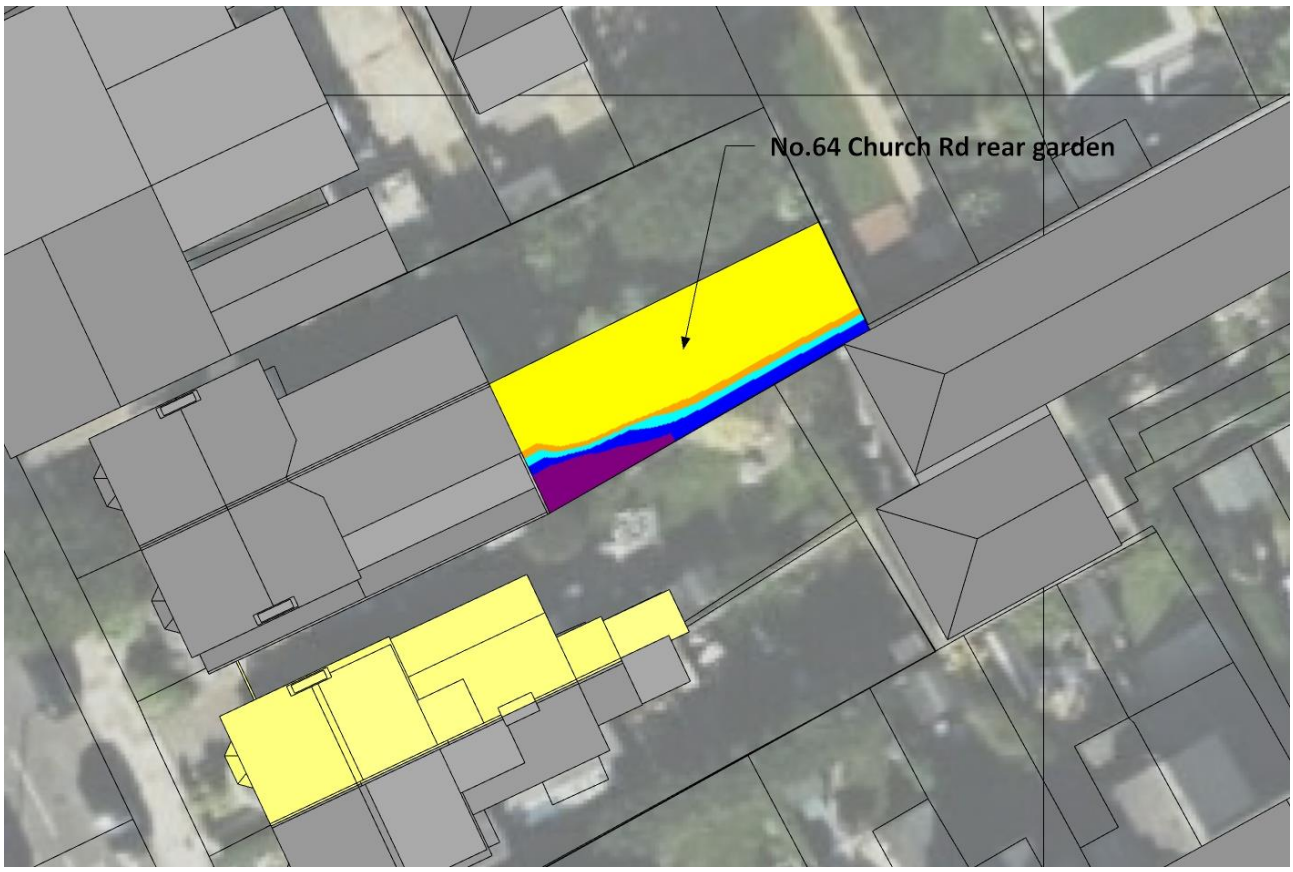

Fig 1. Aerial view showing existing % area of neighbouring amenity areas to receive a minimum of 2 hours of direct sunlight on 21st March. North to top.

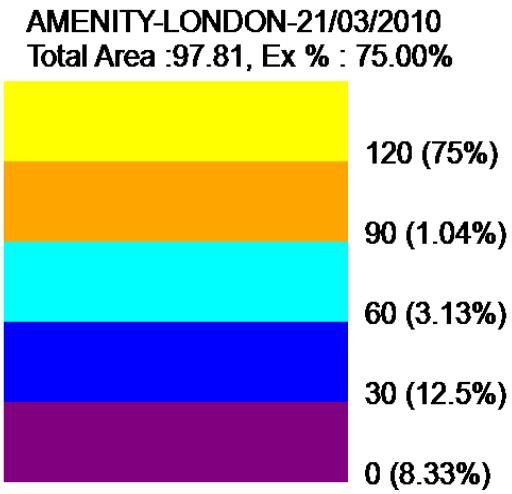

Fig 2. Existing legend – No.64 Church Road rear garden.

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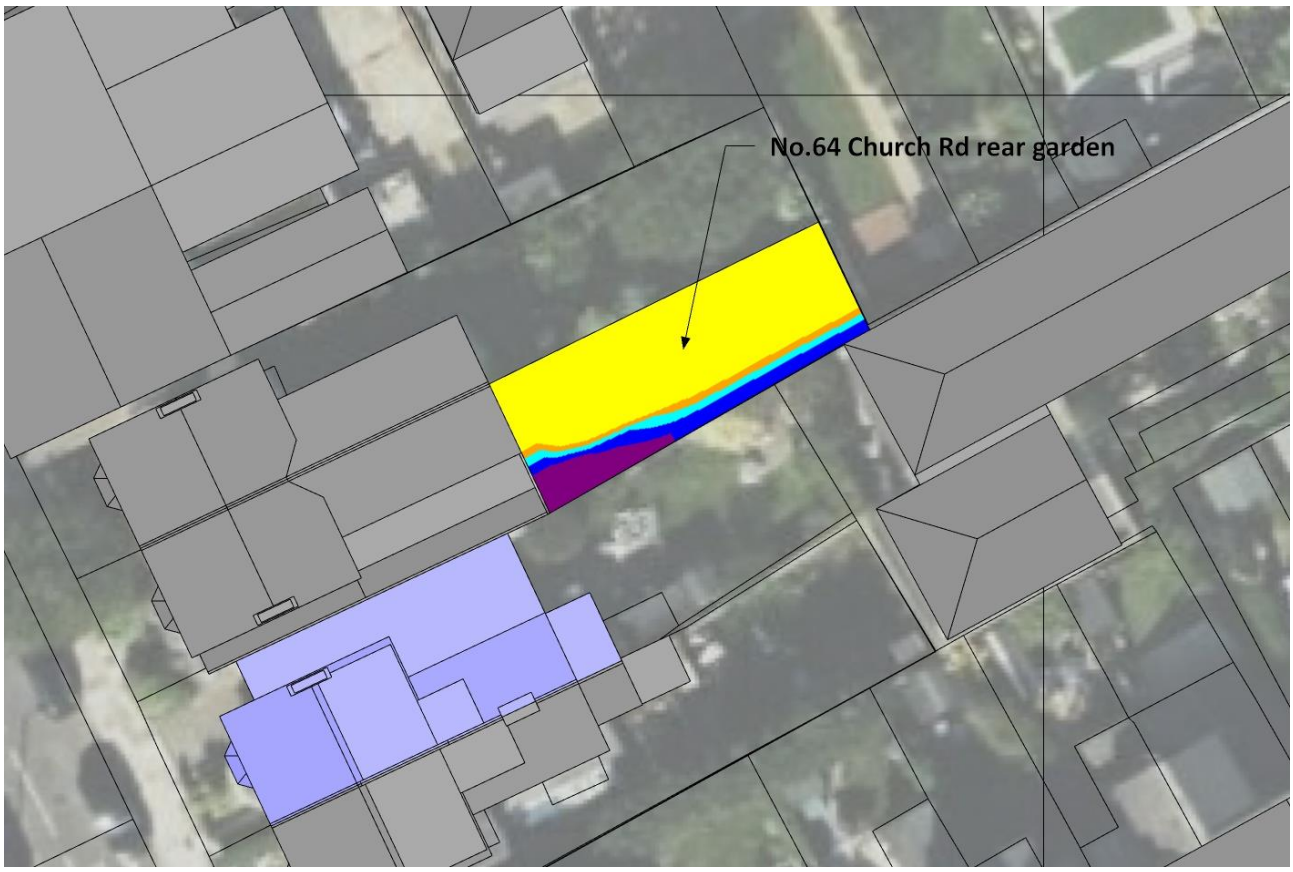

Fig 3. Aerial view showing proposed % area of neighbouring amenity areas to receive a minimum of 2 hours of direct sunlight on 21st March. North to top.

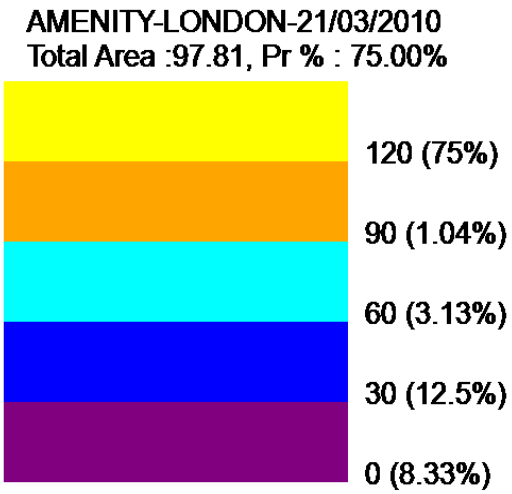

Fig 4. Proposed legend – No.64 Church Road rear garden.

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