



DAYLIGHT & SUNLIGHT ASSESSMENT

MARCH 2022, REF: 2218/LIGHT

CLIENT:

Kit London

SITE ADDRESS:

Plot adjacent to No.2 Horace Road
London E7 0HA

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Introduction

This report has been commissioned by Kit London and prepared by The Daylight Lab to assess the impact of the proposed new house on the plot adjacent to No.2 Horace Road on the levels of daylight and sunlight enjoyed by neighbouring properties, and the levels of daylight and sunlight within the proposed new dwelling.

The approach is based on the BRE's "Site Layout Planning for Daylight and Sunlight, a Guide to Good Practice", Second Edition, PJ Littlefair 2011, which is generally accepted as good practice by Local Planning Authorities.

Site & Project Description

The application site comprises an open plot on the south side of Horace Road, currently used for materials storage.

Neighbouring to the east are the rear elevations of Nos.4-14 Woodford Road, a terrace of ground floor commercial units with residential accommodation at 1st floor.

Neighbouring to the west is the flank elevation of a 2 storey end of terrace house at No.2 Horace Road.

Neighbouring to the north and south are open storage/parking areas.

It is proposed to construct a 3 bedroom single family dwelling over lower ground, upper ground and first floor levels.

Proposed plans and elevations can be found in Appendix 1.

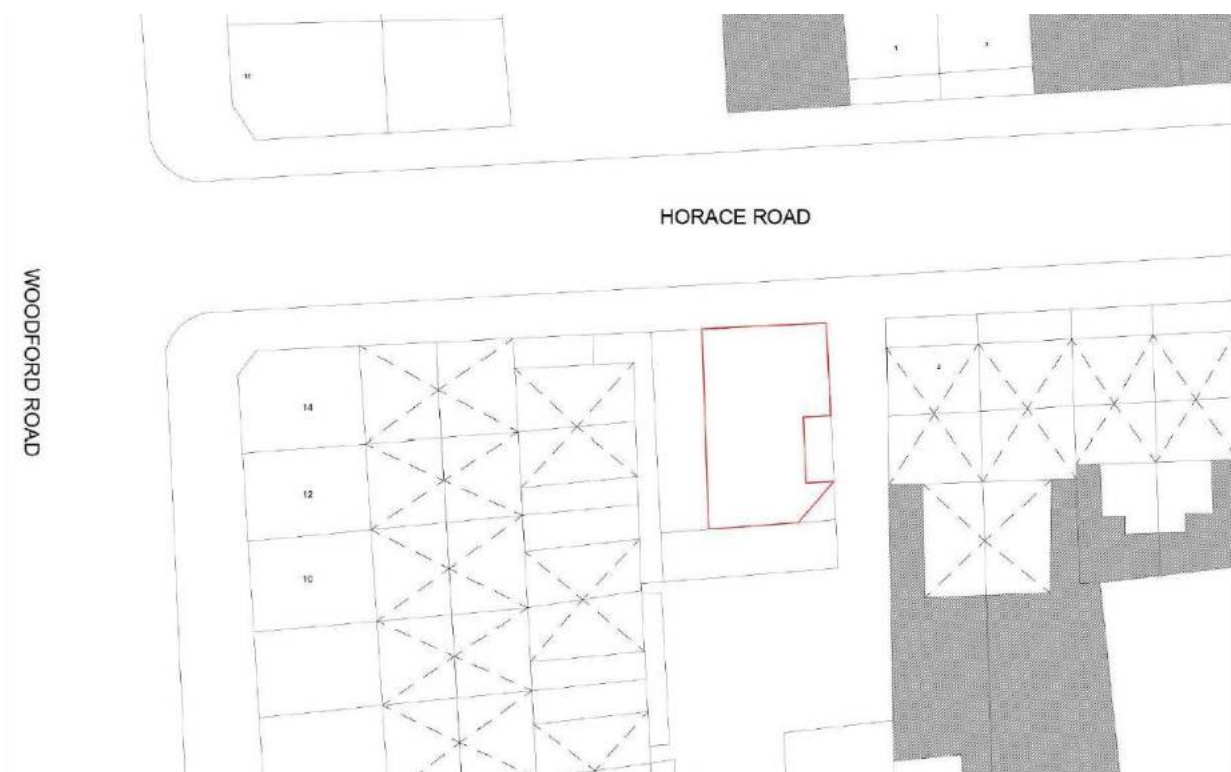


Fig 1. Location Plan. North to top. Do not scale.

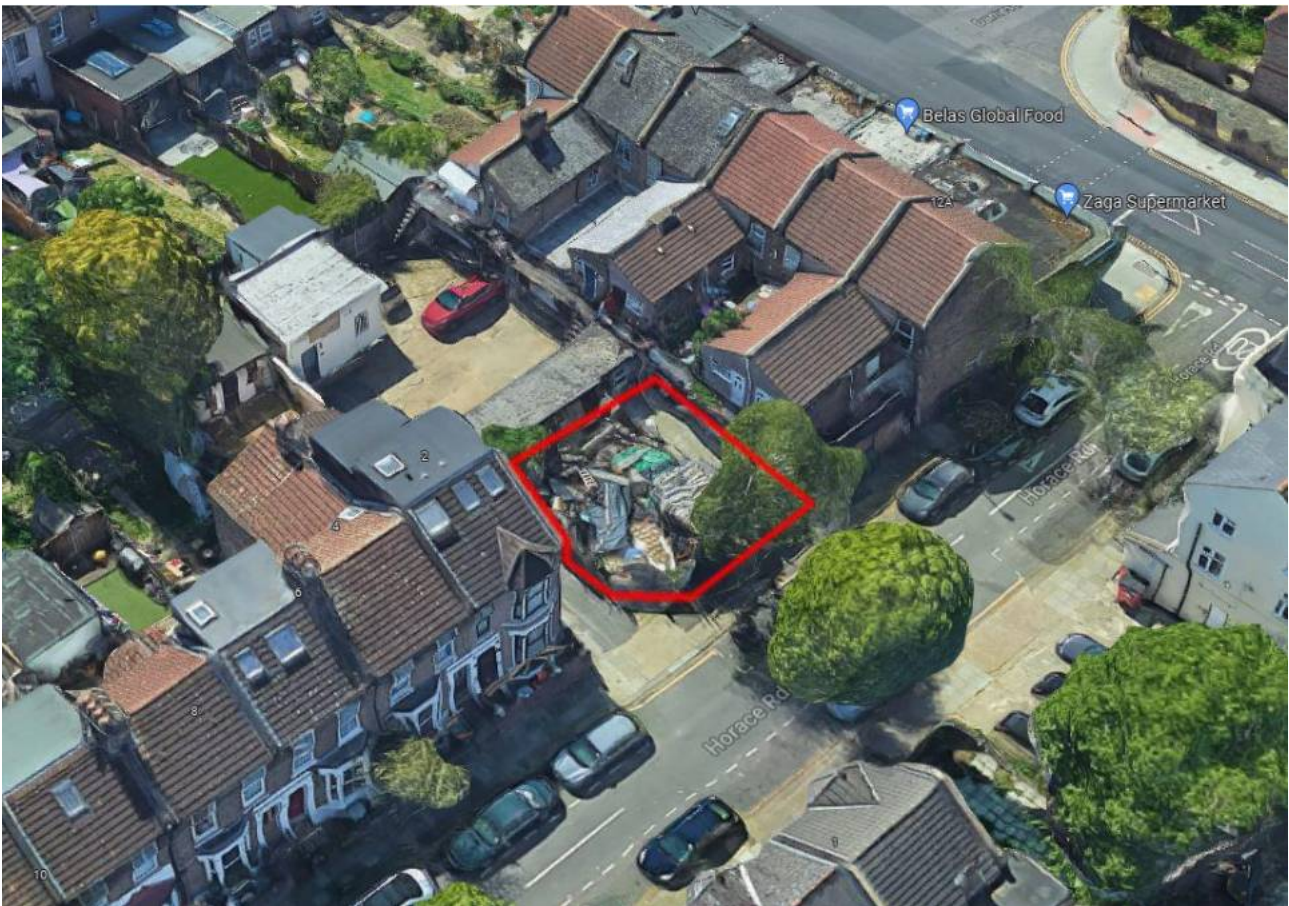


Fig 2. Aerial view of site from north-west.

Methodology

Existing and proposed 3D models of the site and neighbouring properties were constructed to a level of detail suitable for testing using drawings provided by the architect, Remi.C.T Studios, along with OS data and photographs.

Trees were ignored as those close to the site are deciduous, with the BRE guide stating that: *“Where the effect of a new building on existing buildings is being analysed, it is usual to ignore the effect of existing trees. This is because daylight is at its scarcest and most valuable in winter when most trees will not be in leaf”* (Appendix H, page 70, paragraph H1.2).

Materials were set to provide accurate reflectance values with white painted walls and ceilings and light coloured wooden floors within the proposed dwellings, and yellow stock brick, off white render, roof tiles and tarmac elsewhere.

The following methods of measurement were then applied in full accordance with the BRE guidelines using specialist analysis software (MBS Daylight & Daylight Visualiser):

Loss of Light to Neighbouring Properties

Daylight - Vertical Sky Component (VSC)

The Vertical Sky Component 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. 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 – 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. If following construction of a new development the no sky line moves so that the area of existing room which does not receive direct skylight is reduced to less than 0.8 times its former value this will be noticeable to the occupants.

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 a 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.

Internal Lighting Within New Dwellings

Daylight - Average Daylight Factor (ADF)

Daylight provision in proposed rooms may be checked using the Average Daylight Factor (ADF). The ADF is a measure of the overall amount of daylight in a space and may be defined as the ratio of daylight flux incident on the working plane to the area of the working plane, expressed as a percentage of the outdoor illuminance on a horizontal plane due to an unobstructed CIE standard overcast sky (for residential accommodation the working plane is typically measured at 850mm above floor level and set in 500mm from the perimeter walls). Thus a 1% ADF would mean that the average indoor illuminance would be one hundredth of the outdoor unobstructed illuminance. BS 8206-2 *Code of practice for daylighting* recommends an ADF of 5% for a well day-lit space and 2% for a partly day-lit space with acceptable minimum values of 2% for kitchens, 1.5% for living rooms and combined living/kitchen/diners, and 1% for bedrooms.

Daylight - Room Depth

If a proposed habitable room has windows in only one wall the depth of the room should ideally not exceed the limiting value given by $(L/W) + (L/H) < (2/(1-R_b))$, where L is the room length, W the room width, H the window head height above floor level and R_b the average reflectance of the surface in the rear half of the room. If L exceeds this value supplementary electric lighting will be required towards the end of the room furthest from the window.

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.

The following figures 3-10 show the existing and proposed models as tested.

Figures 11-12 then provide window references for those tested at neighbouring properties.

Figure 13 then provides window references for those tested at the proposed development.

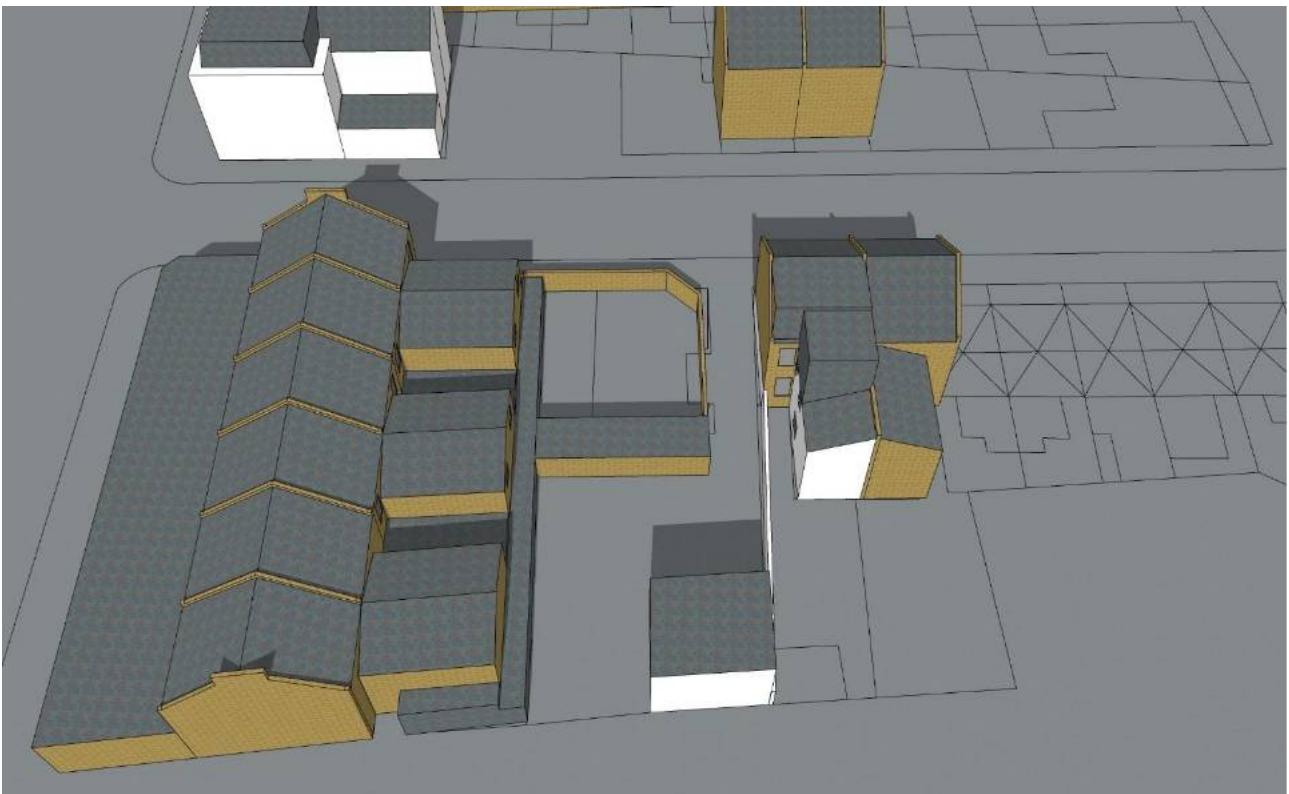


Fig 3. As existing 3D model viewed from south. Shadows set to 12pm, 21st March (the equinox).

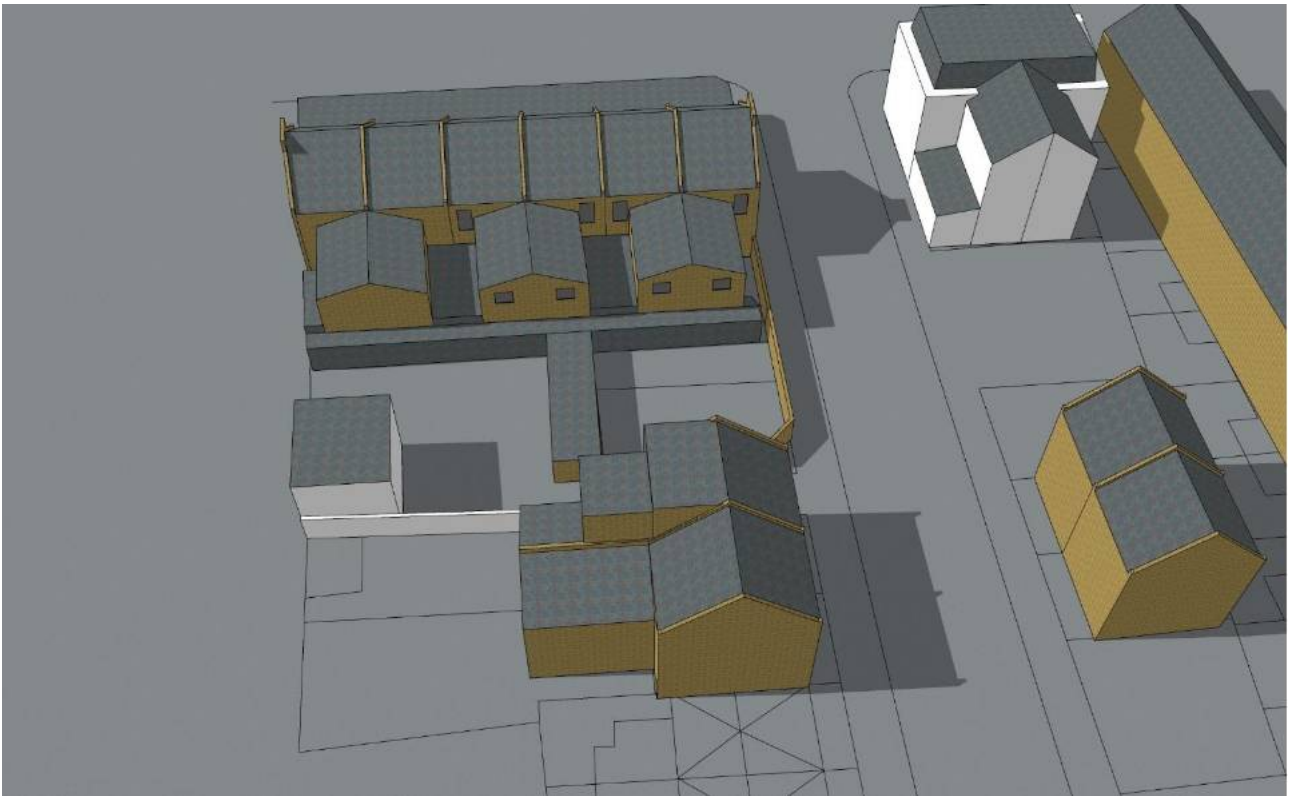


Fig 4. As existing 3D model viewed from east. Shadows set to 12pm, 21st March (the equinox).

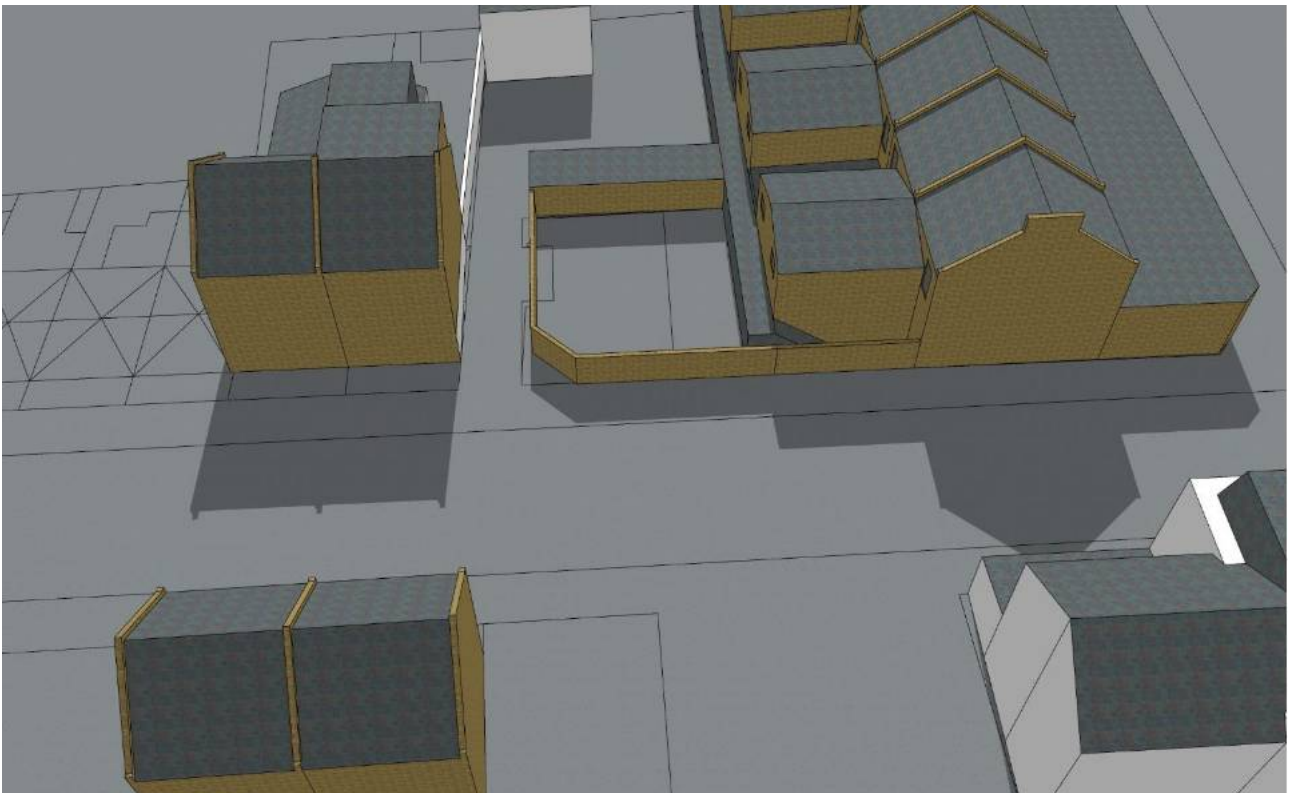


Fig 5. As existing 3D model viewed from north. Shadows set to 12pm, 21st March (the equinox).

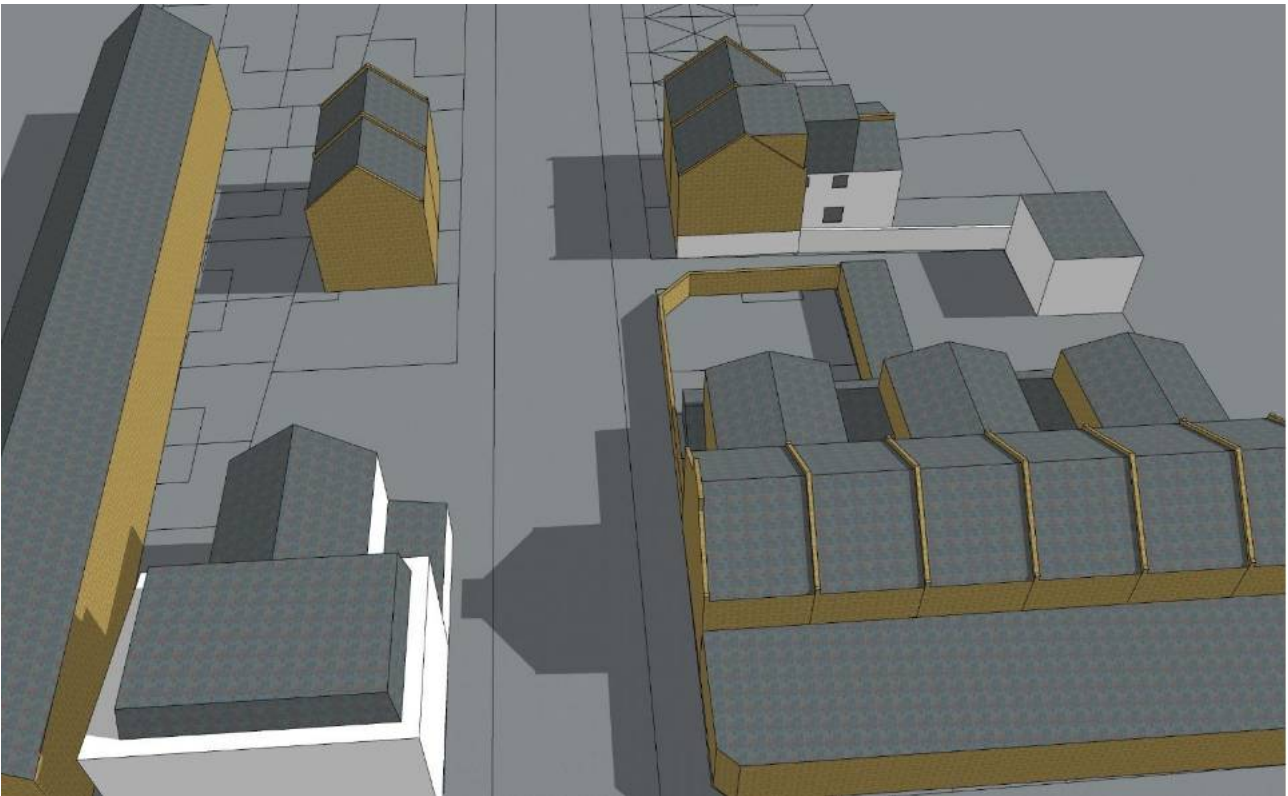


Fig 6. As existing 3D model viewed from west. Shadows set to 12pm, 21st March (the equinox).

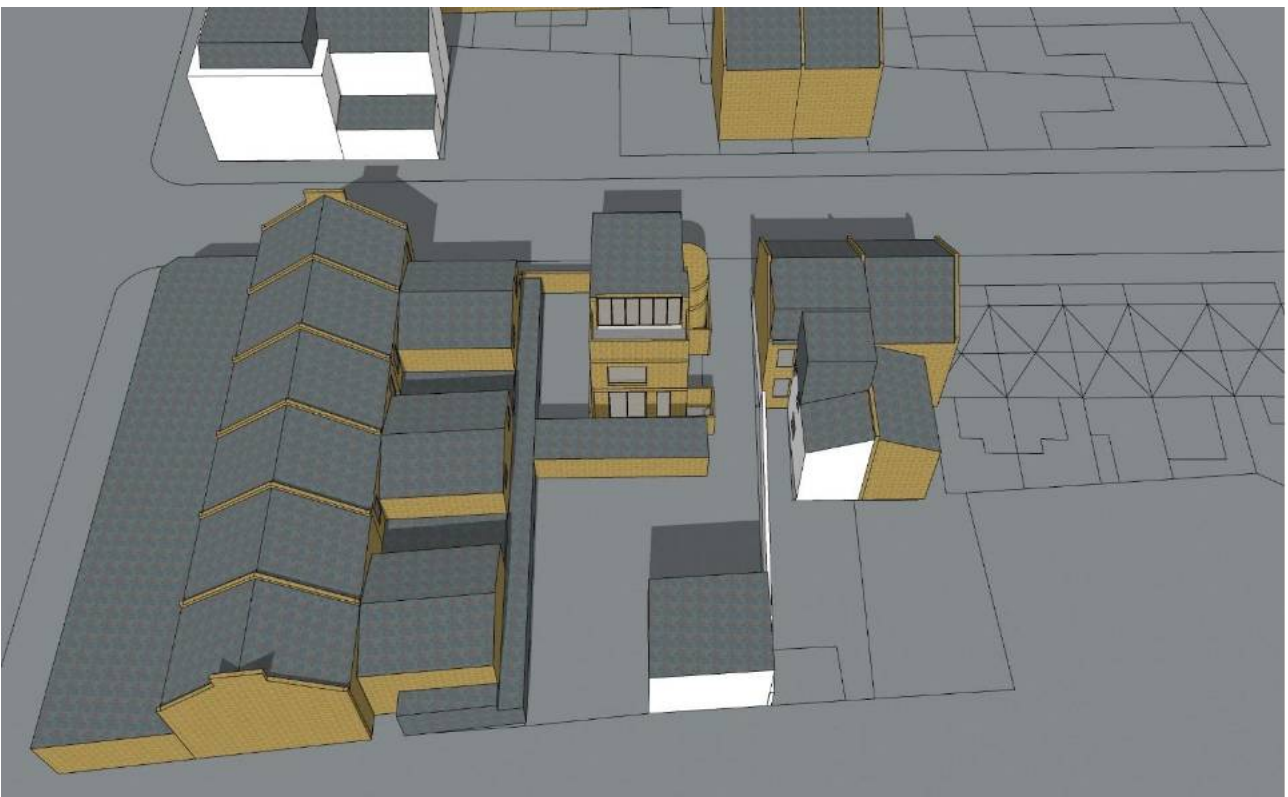


Fig 7. As proposed 3D model viewed from south. Shadows set to 12pm, 21st March (the equinox).



Fig 8. As proposed 3D model viewed from east. Shadows set to 12pm, 21st March (the equinox).

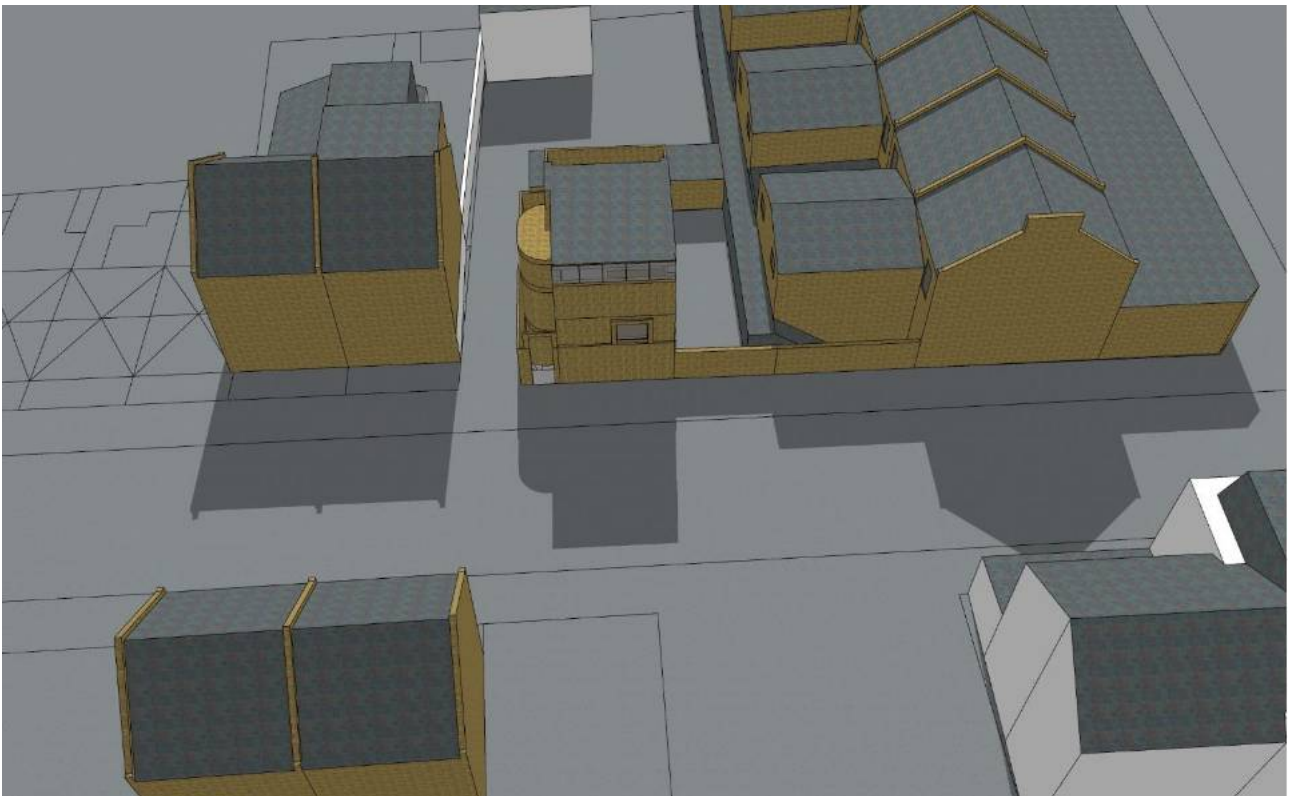


Fig 9. As proposed 3D model viewed from north. Shadows set to 12pm, 21st March (the equinox).

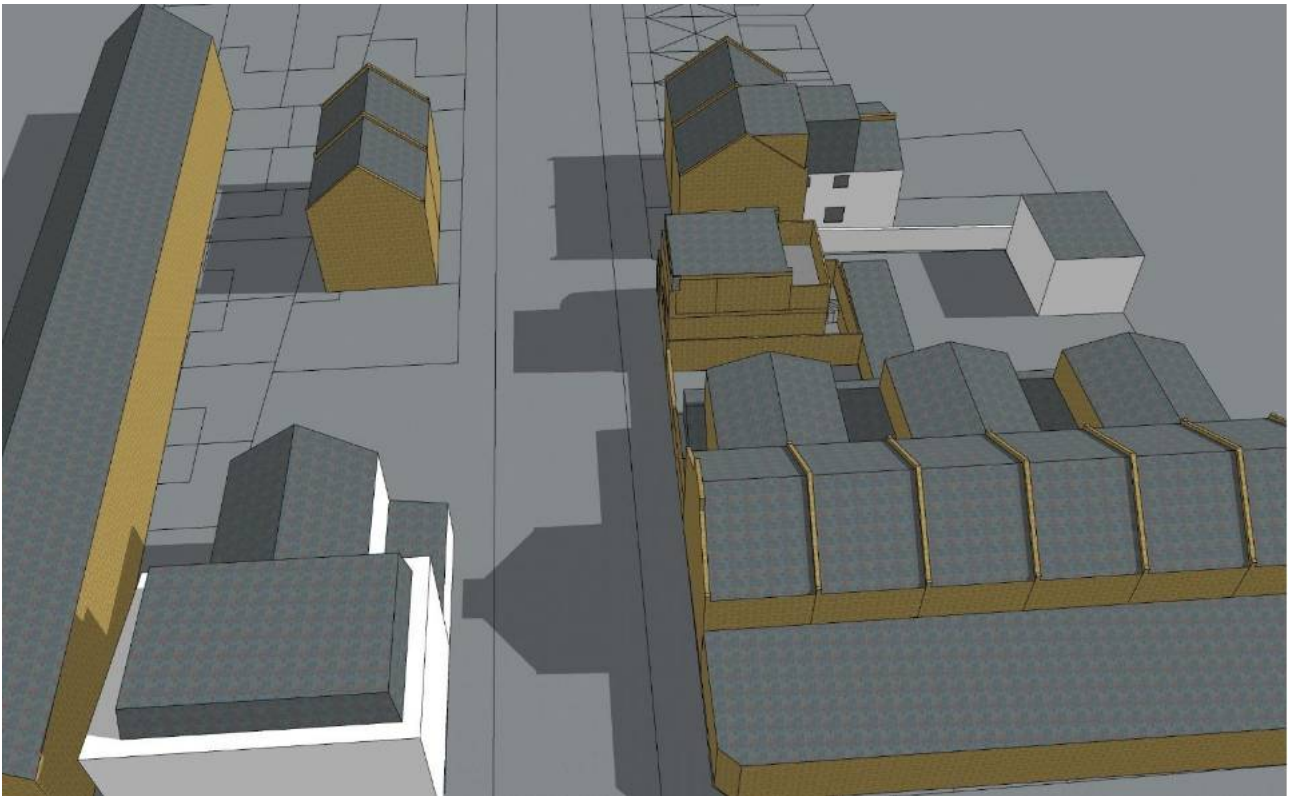


Fig 10. As proposed 3D model viewed from west. Shadows set to 12pm, 21st March (the equinox).

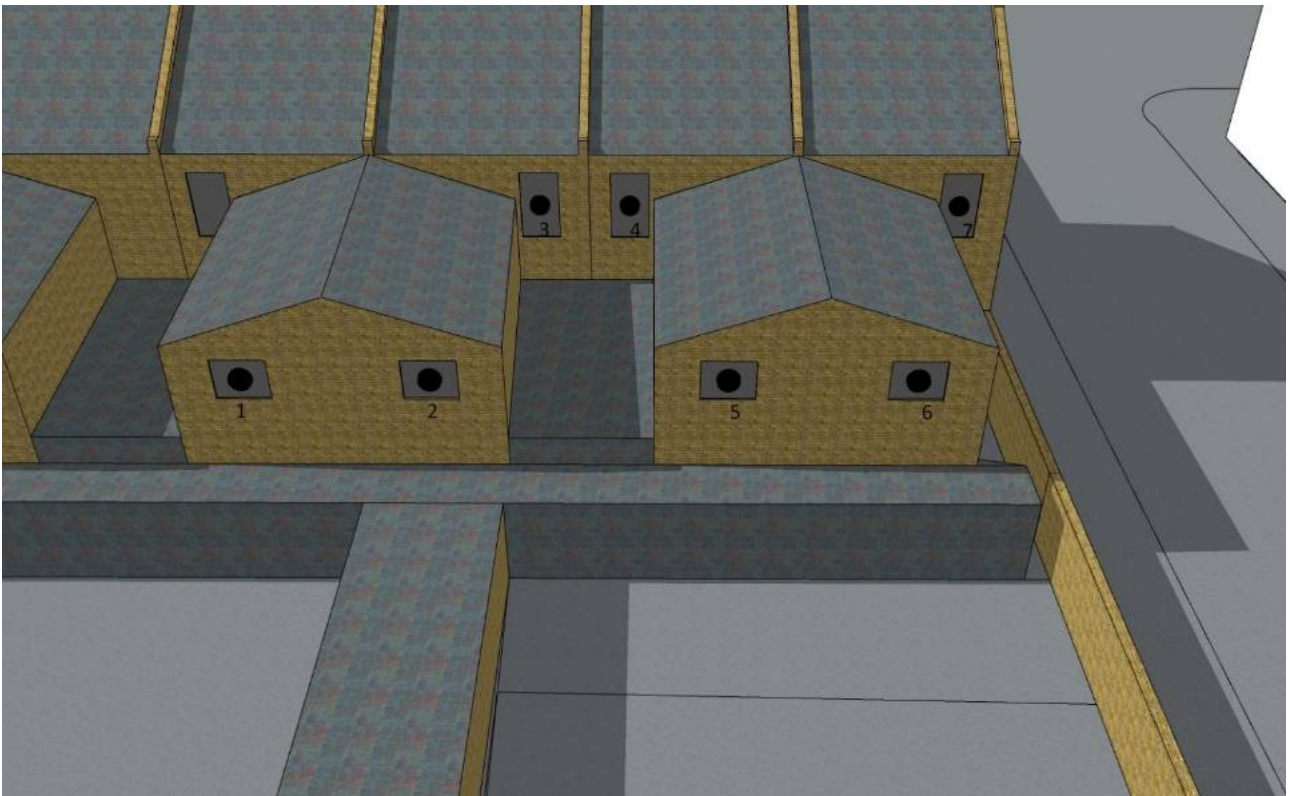


Fig 11. Rear of No.s8-14 Woodford Road with window references indicated.



Fig 12. Rear/side view of No.2 Horace Rod with window references indicated.



Fig 13. Rear elevation of proposed dwelling with living room window reference indicated.

Data

Loss of Light to Neighbouring Properties

Daylight - Vertical Sky Component (VSC)

The following table compares existing and proposed VSC results. Waldram diagrams can be found in Appendix 2.

Table 1. VSC results.

Property	Room Type	Window Id	Ex VSC (%)	Prop VSC (%)	Pr/Ex	Meets BRE?
8 Woodford Rd	Entrance hall	1	n/a	n/a	n/a	n/a
10 Woodford Rd	Entrance hall	2	n/a	n/a	n/a	n/a
10 Woodford Rd	Unknown	3	33.91	33.23	0.98	YES
12 Woodford Rd	Unknown	4	34.04	33.52	0.98	YES
12 Woodford Rd	Entrance hall	5	n/a	n/a	n/a	n/a
14 Woodford Rd	Entrance hall	6	n/a	n/a	n/a	n/a
14 Woodford Rd	Unknown	7	34.97	34.11	0.98	YES
2 Horace Road	Unknown	8	22.88	22.88	1	YES
2 Horace Road	Unknown	9	21.11	20.83	0.99	YES
2 Horace Road	Unknown	10	32.87	31.05	0.94	YES
2 Horace Road	Unknown	11	19.99	19.99	1	YES
2 Horace Road	Unknown	12	29.20	25.14	0.86	YES

Daylight – No Sky Line

Detailed information on the internal layouts of neighbouring properties was not available so calculations for daylight distribution could not be prepared. Please see conclusion.

Sunlight - Annual Probable Sunlight Hours (APSH/WPSH)

The following table compares existing and proposed APSH and WPSH results for neighbouring living room windows that face within 90° of due south. Where room types were unknown their results are also included.

Table 2. Annual and winter sunlight hours results.

Property	Room Type	Window Id	Window Orientation	Ex APSH (%)	Prop APSH (%)	Pr/Ex	Meets BRE?	Ex WPSH (%)	Prop WPSH (%)	Pr/Ex	Meets BRE?
8 Woodford Rd	Entrance hall	1	87°N	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
10 Woodford Rd	Entrance hall	2	87°N	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
10 Woodford Rd	Unknown	3	87°N	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
12 Woodford Rd	Unknown	4	87°N	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a

12 Woodford Rd	Entrance hall	5	87°N	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
14 Woodford Rd	Entrance hall	6	87°N	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
14 Woodford Rd	Unknown	7	87°N	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
2 Horace Road	Unknown	8	46	46	1	YES	17	17	1	YES	46
2 Horace Road	Unknown	9	36	35	0.97	YES	10	10	1	YES	36
2 Horace Road	Unknown	10	47	46	0.98	YES	14	14	1	YES	47
2 Horace Road	Unknown	11	44	44	1	YES	15	15	1	YES	44
2 Horace Road	Unknown	12	44	42	0.95	YES	12	12	1	YES	44

Internal Lighting Within New Dwellings

Daylight - Average Daylight Factor (ADF)

The following table compares ADF results for the proposed habitable rooms with BRE recommendations. Gradient maps indicating the daylight distribution can be found in Appendix 3.

Table 3. Average Daylight factor results.

Room	ADF (%)	Minimum Accepted (%)	Meets BRE?
Bedroom 1	2.88	1	YES
Bedroom 2	1.68	1	YES
Bedroom 3	7.69	1	YES
Living/kitchen/dining	1.73	1.5	YES
Studio/office	7.84	n/a	YES

Daylight - Room Depth

The following table provides results for room depth calculations for all proposed single aspect habitable rooms.

Table 4. Room depth results.

Unit	Room	Length (L)	Width (W)	Window Head (H)	Average Room Reflectance (Rb)	(L/W) + (L/H)	(2/(1-Rb))	Supplementary lighting required?
1	Bedroom 1	2.34	4.87	2.1	0.45	1.59	3.64	NO
2	Bedroom 2	2.94	3.5	2.1	0.45	2.24	3.64	NO

Sunlight - Annual Probable Sunlight Hours (APSH/WPSH)

The following table provides proposed APSH and WPSH for the proposed living room windows that face within 90° of due south.

Table 5. Annual and winter probable sunlight hours results (proposed new units).

Window Id	Window Orientation	Prop APSH (%)	Min accepted (%)	Meets BRE?	Prop WPSH (%)	Min accepted (%)	Meets BRE?
13	177°	50	25	YES	6	5	YES

Conclusion

Loss of Light to Neighbouring Properties

Daylight - Vertical Sky Component (VSC)

All applicable neighbouring windows tested met BRE guidelines for loss of daylight with very good results.

Daylight – No Sky Line

It was not possible to survey the internal layouts of neighbouring properties, however the very good VSC results indicate that there will be no undue change to the no sky line in any neighbouring property as a result of the proposal.

Sunlight - Annual Probable Sunlight Hours (APSH/WPSH)

All applicable neighbouring windows tested meet BRE guidelines for loss of sunlight with very good results.

Internal Lighting Within New Dwellings

Daylight - Average Daylight Factor (ADF)

All proposed habitable rooms were found to exceed relevant minimum accepted figures for ADF in new dwellings.

Daylight – Room Depth

All proposed single aspect habitable rooms met desired figures for maximum room depth.

Sunlight - Annual Probable Sunlight Hours (APSH/WPSH)

The proposed dwelling enjoys a living room window that faces within 90° of due south and receives in excess of relevant minimum accepted figures for APSH and WPSH in new dwellings.

Closing Statement

No undue loss of daylight or sunlight will be experienced by neighbouring properties as a result of the proposed development on the land adjacent to No.2 Horace Road.

The proposed new dwelling enjoys good levels of daylight and sunlight.

The proposal therefore satisfies BRE and local policy requirements for both daylight and sunlight.



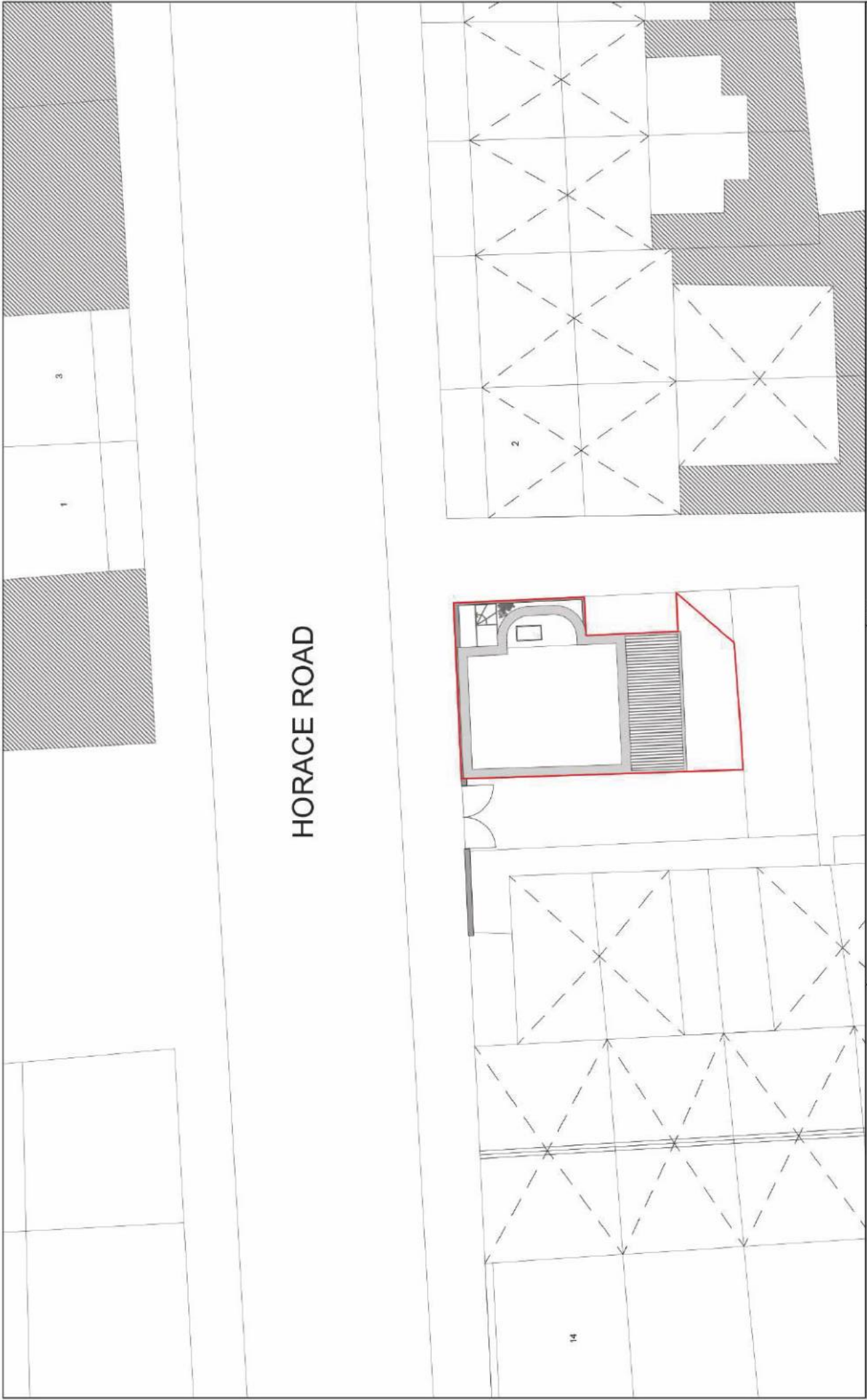


William Pottinger, The Daylight Lab, March 2022.

APPENDIX 1

Existing and Proposed Plans and Elevations
(do not scale).





HORACE ROAD

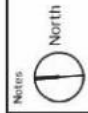
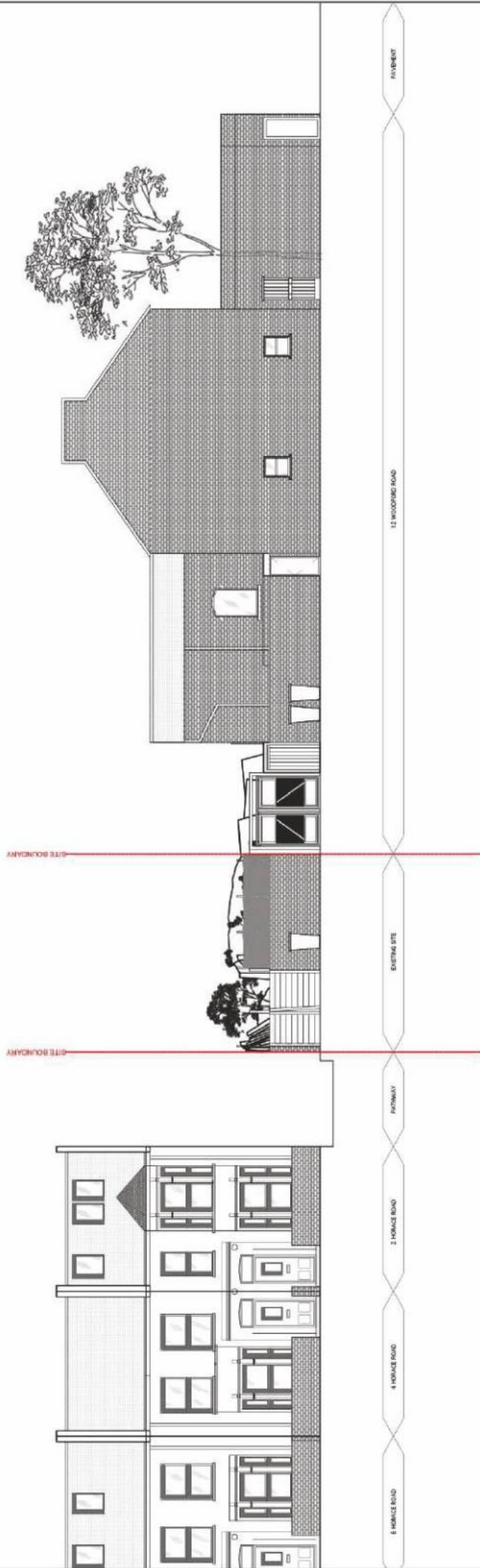
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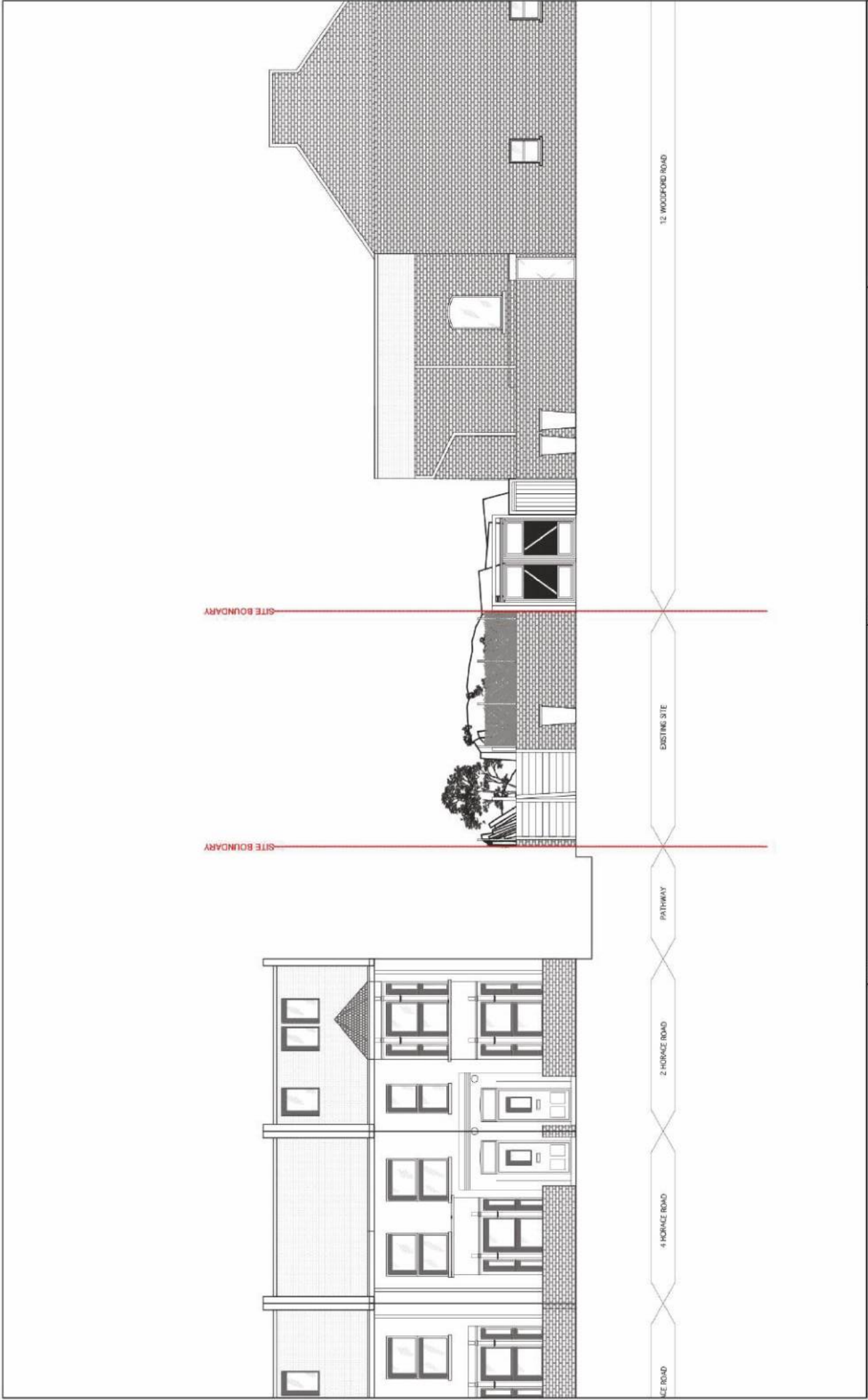
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Project		Horace Road E7 ODL	
Drawing Title	Existing Street Elevation (North)	Drawing Number	
Scale	1:200	Date	18/01/2021

R E M I · C · T

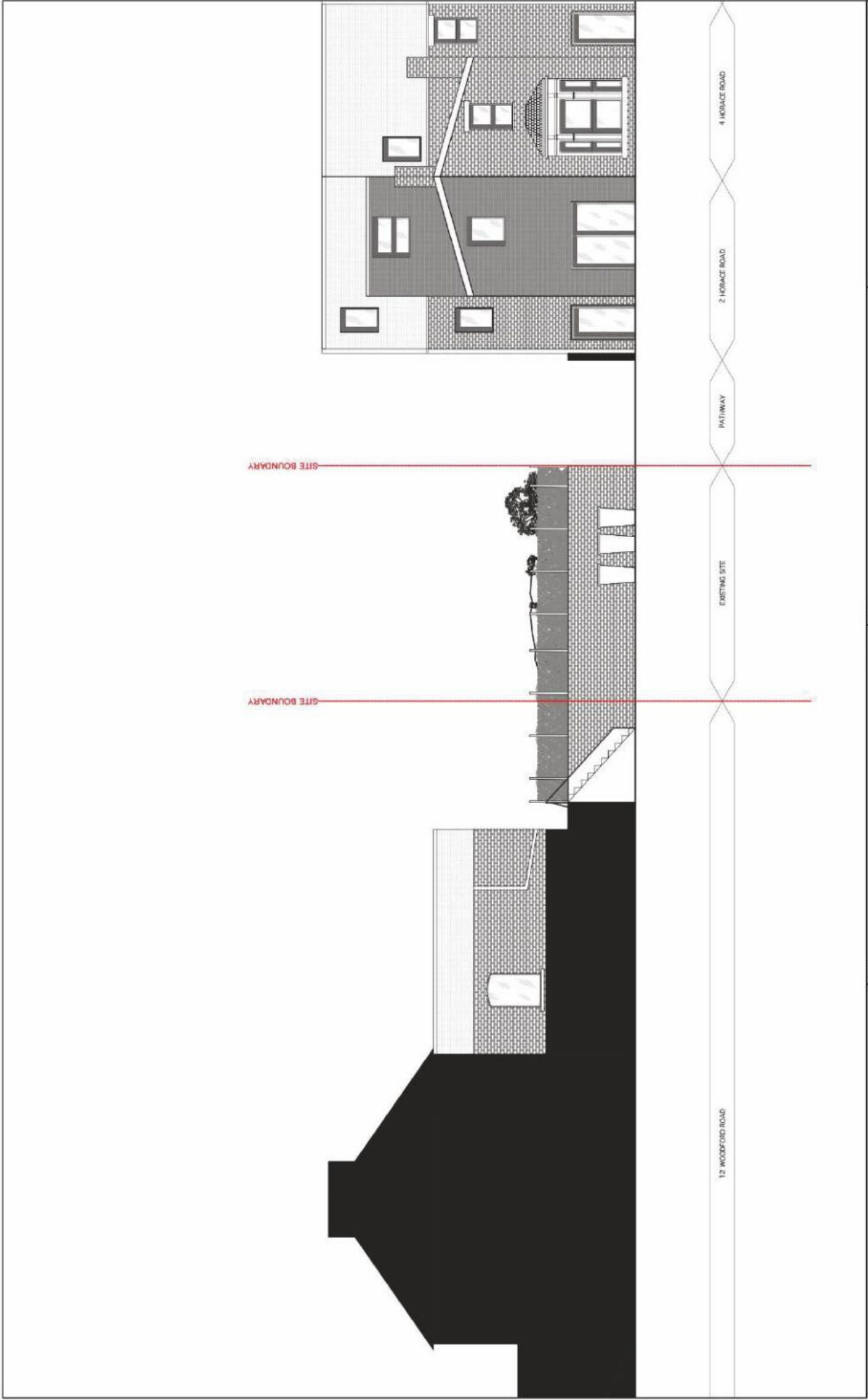
FOR PLANNING USE ONLY



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FOR PLANNING USE ONLY

R E M I C T



Project

Horace Road E7 ODL

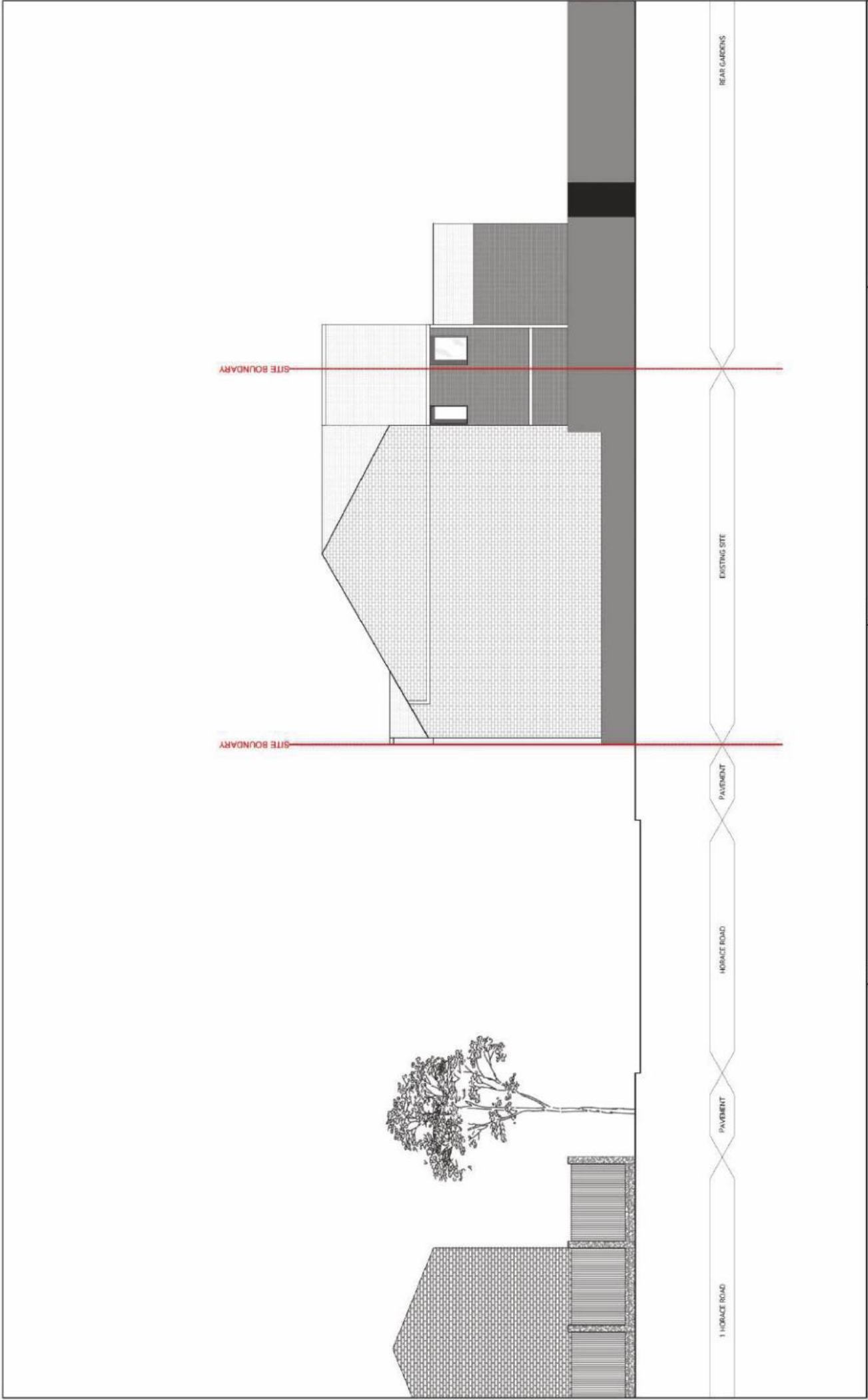



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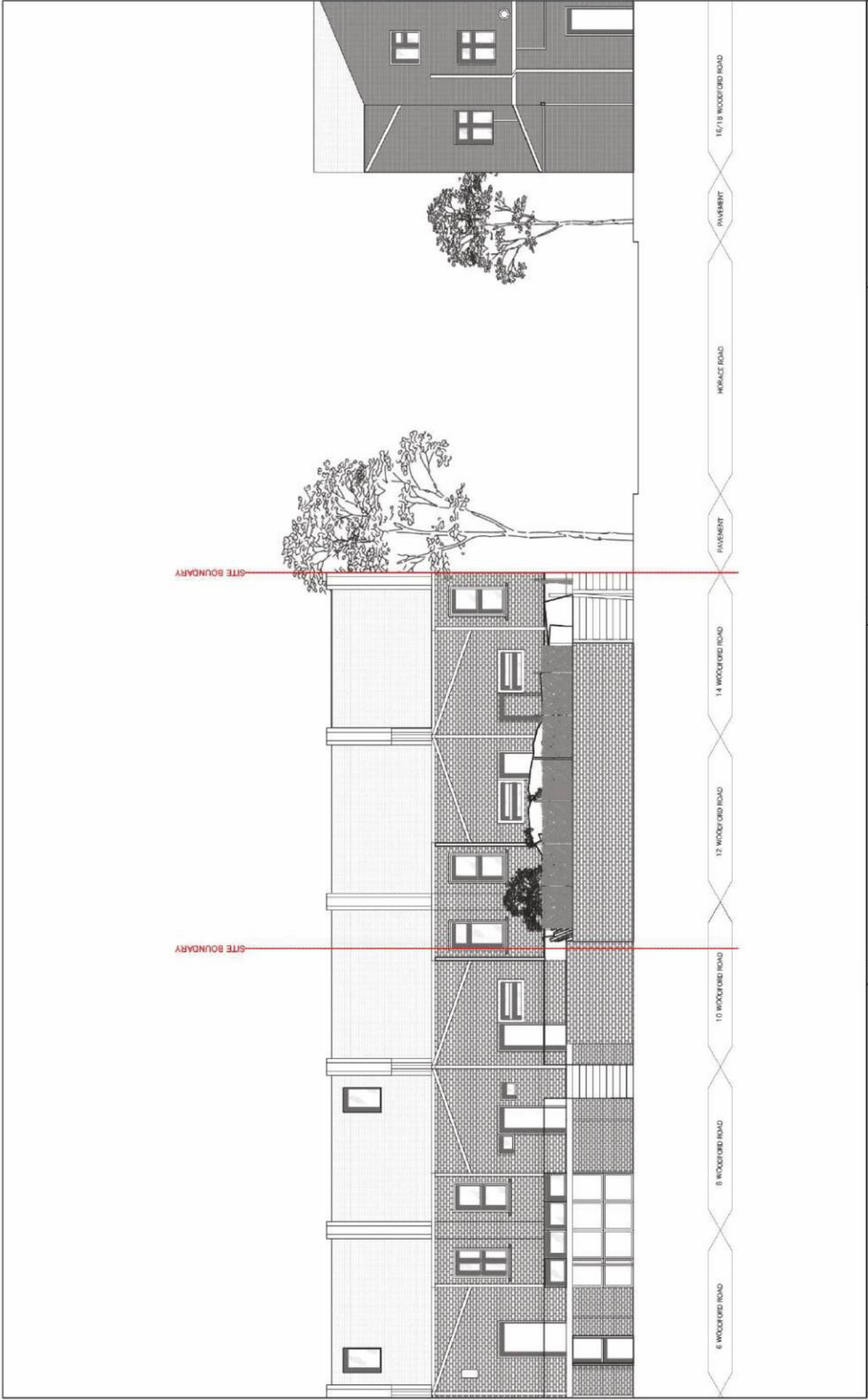
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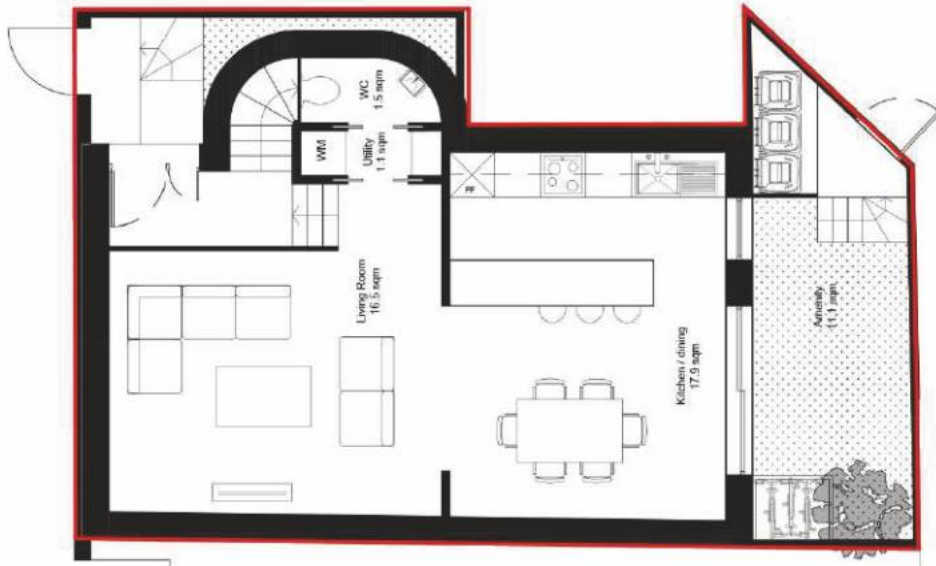
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Drawing Title	Existing East Elevation	Drawing Number	Date
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HORACE ROAD



Project

Horace Road E7 ODL

Meters



North

Drawing Title

Lower Ground Floor

Drawing Number

Scale

1:100

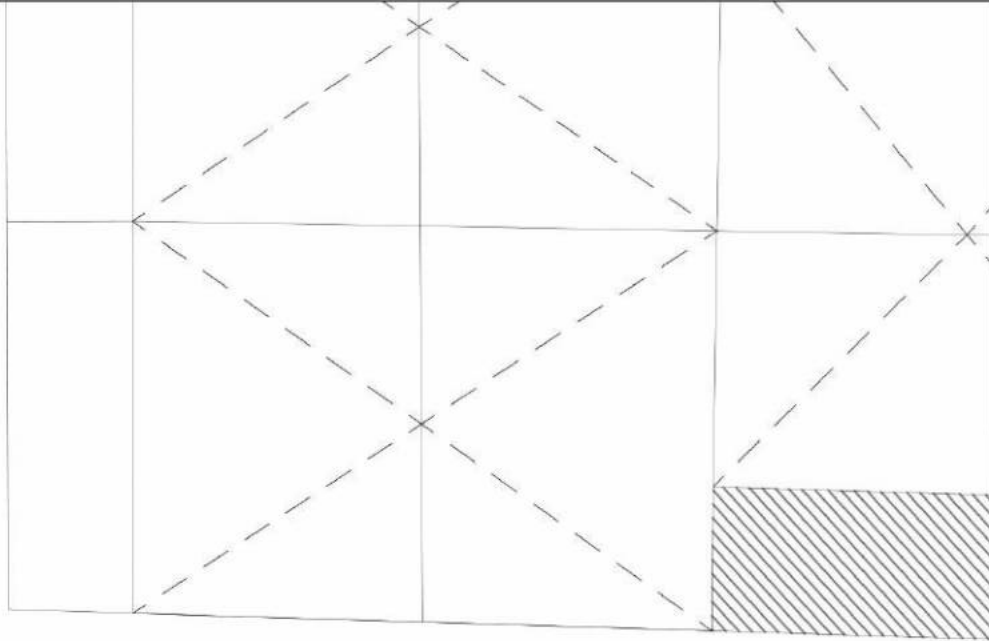
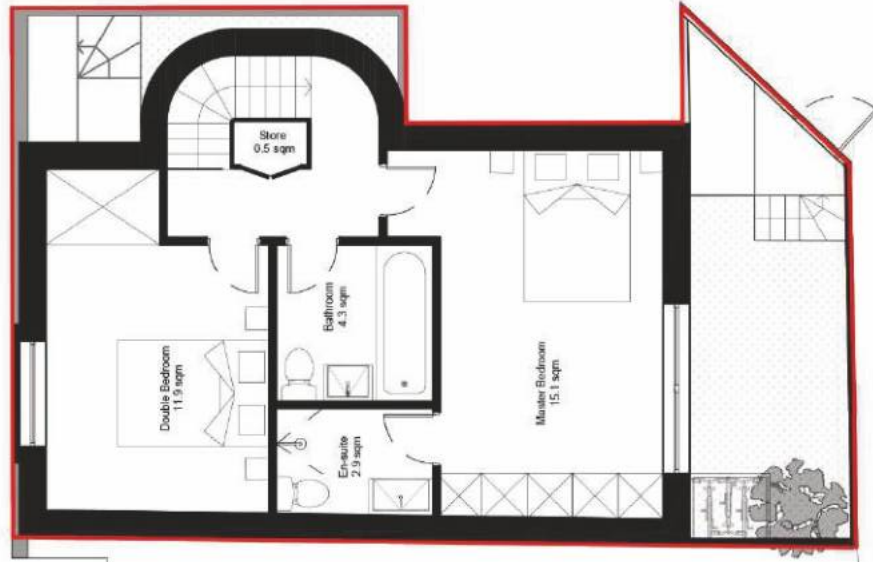
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18/01/2021

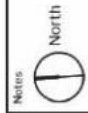
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HORACE ROAD



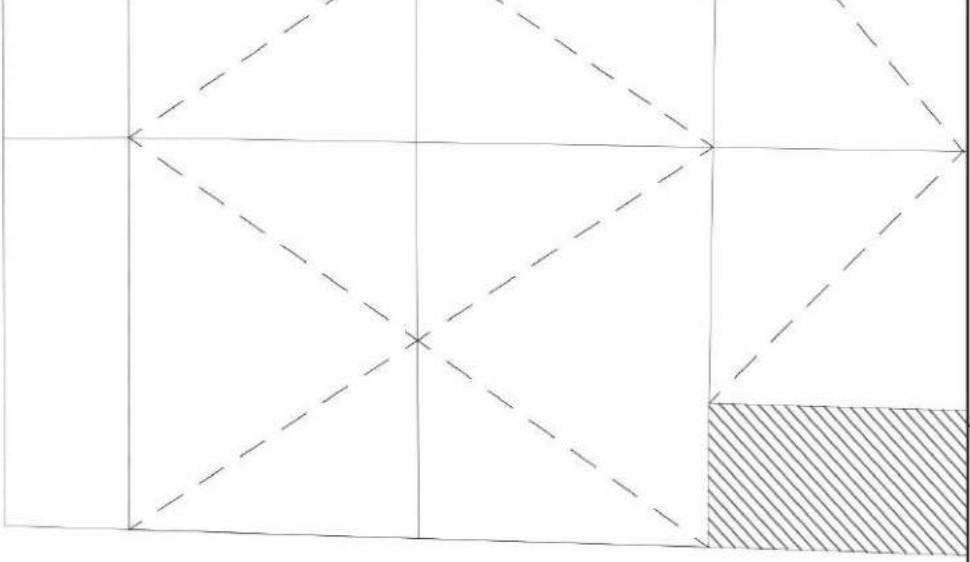
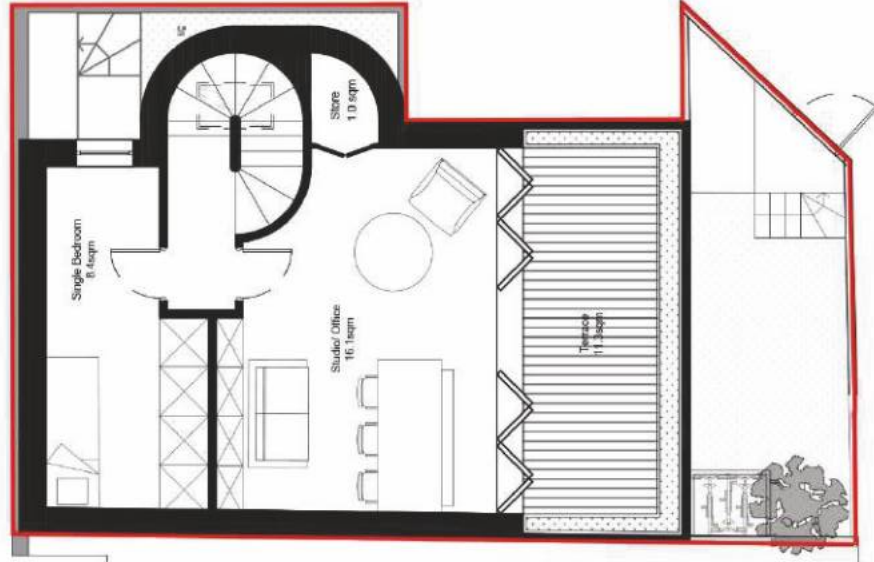
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HORACE ROAD



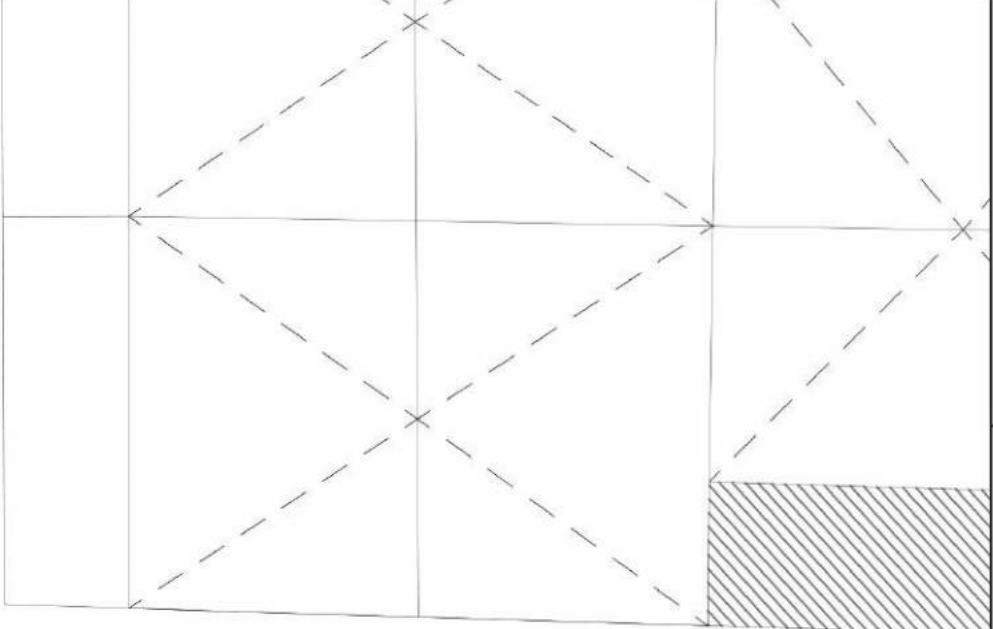
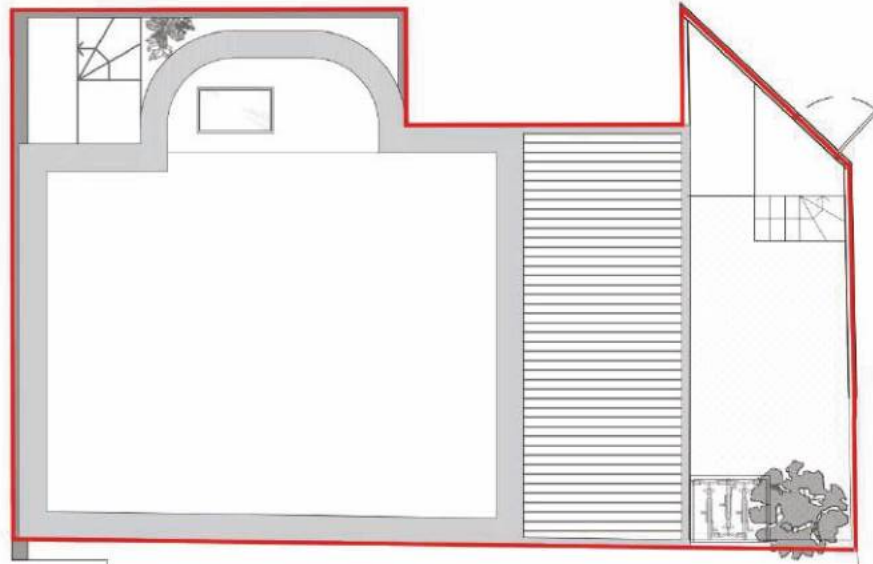
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	18/01/2021



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FOR PLANNING USE ONLY

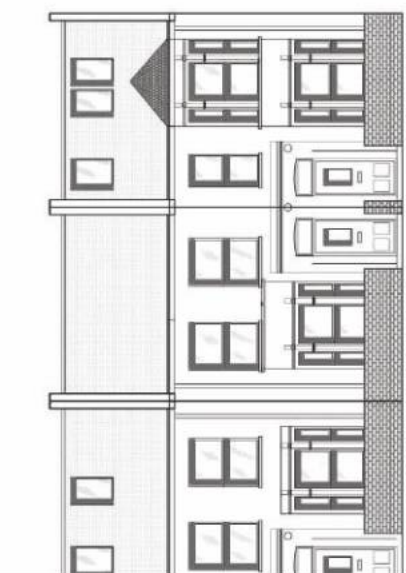
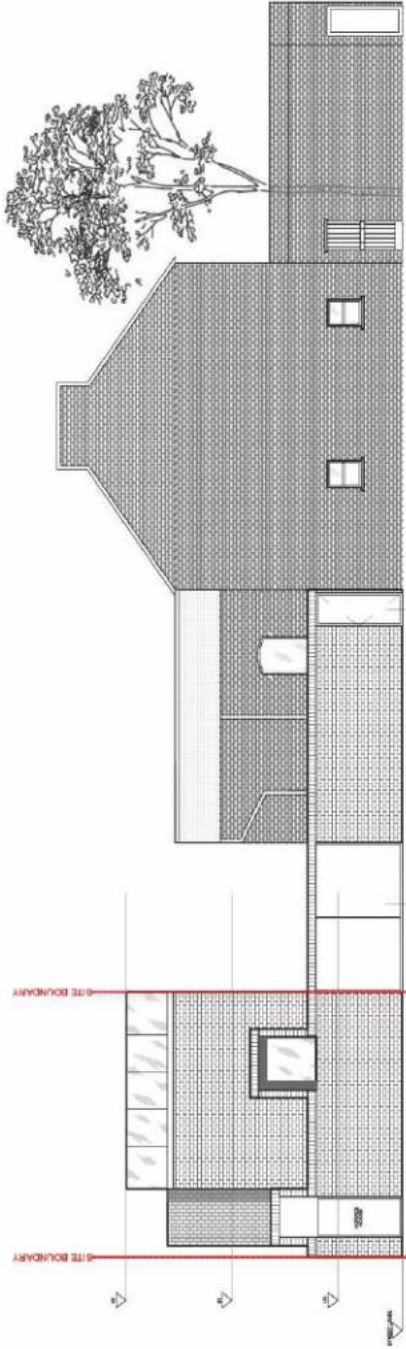
HORACE ROAD



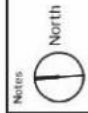
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FOR PLANNING USE ONLY

R E M I C T



5 HORACE ROAD 4 HORACE ROAD 3 HORACE ROAD 2 HORACE ROAD 1 HORACE ROAD 12 WOODBROOK ROAD HUBBERT

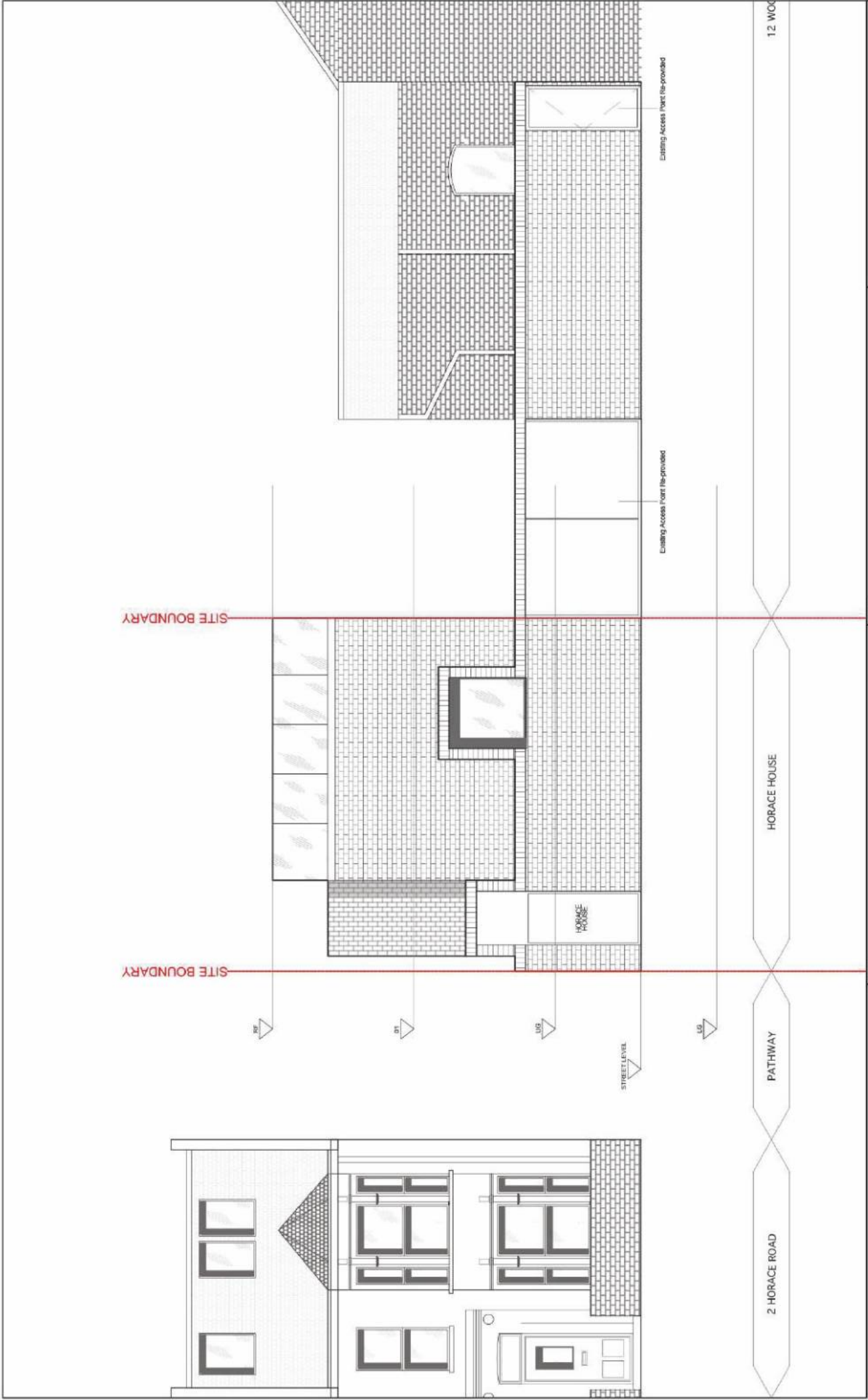


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Drawing Title	Proposed Street Elevation (North)	Drawing Number	
Scale	1:200	Date	18/01/2021



R E M I C T

FOR PLANNING USE ONLY



Project: Horace Road E7 ODL

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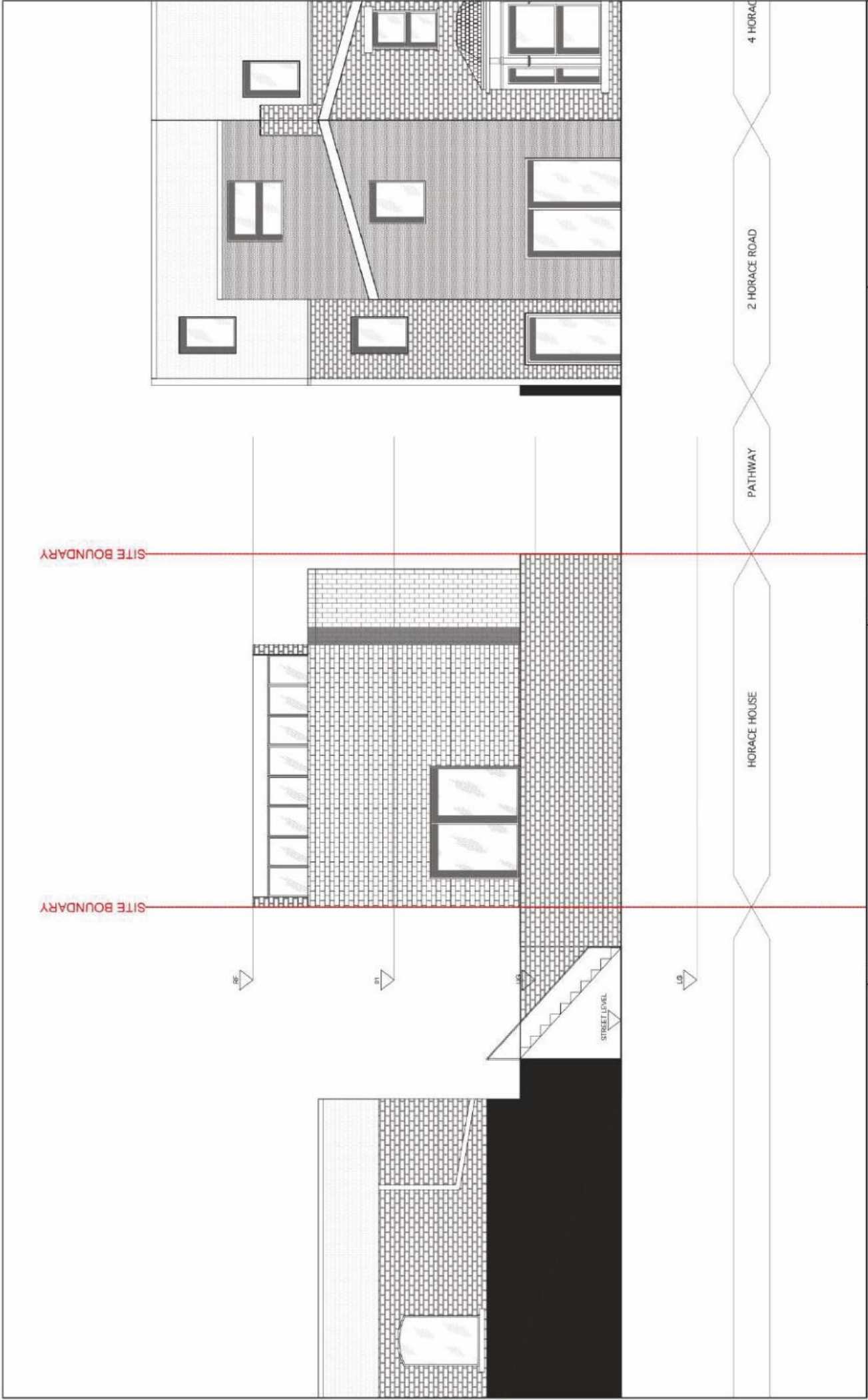
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North

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Project: Horace Road E7 ODL

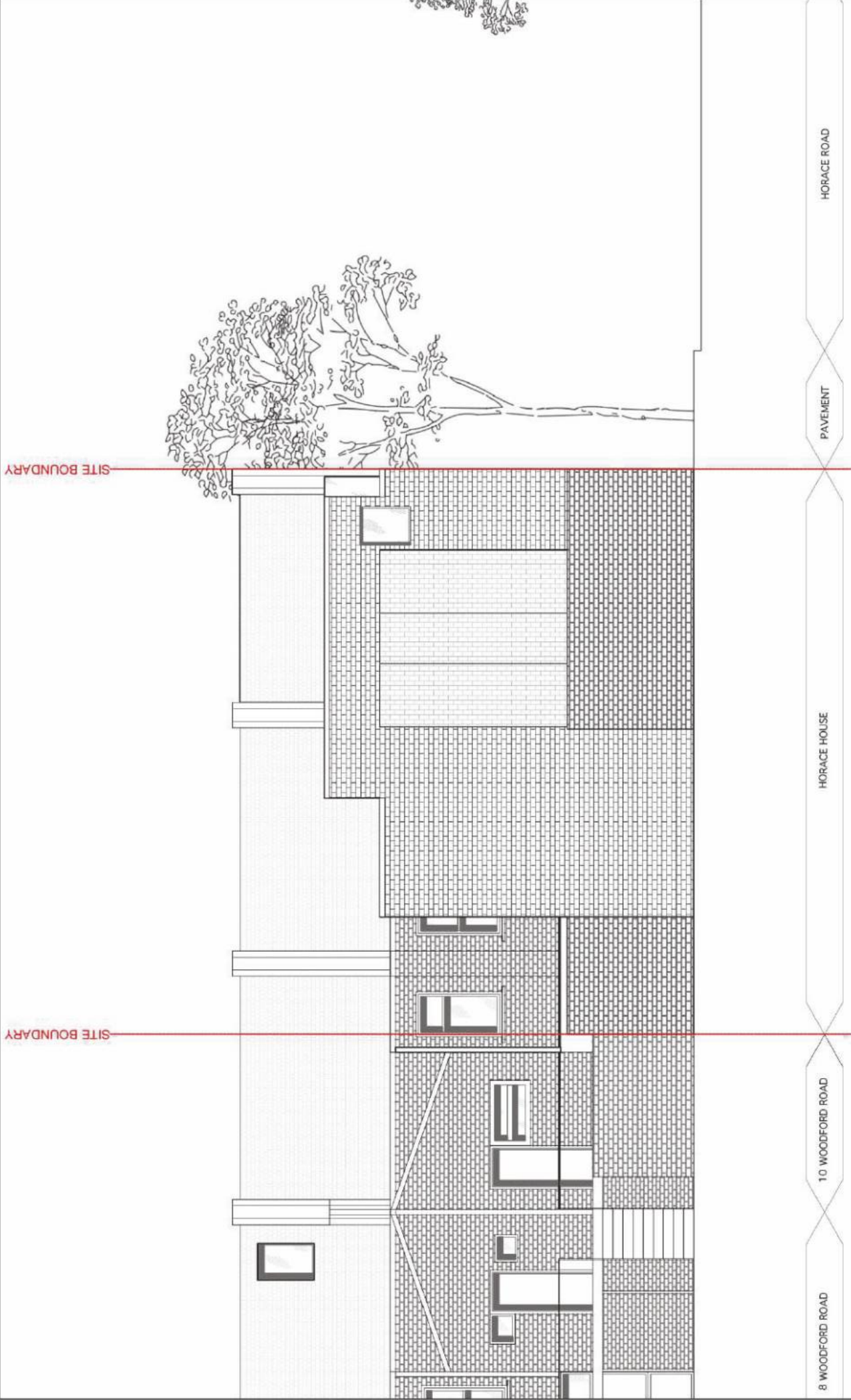
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North

FOR PLANNING USE ONLY

Drawing Title	Proposed South Elevation	Drawing Number	18/01/2021
Scale	1:100	Date	

R E M I C T



8 WOODFORD ROAD

10 WOODFORD ROAD

HORACE HOUSE

HORACE ROAD

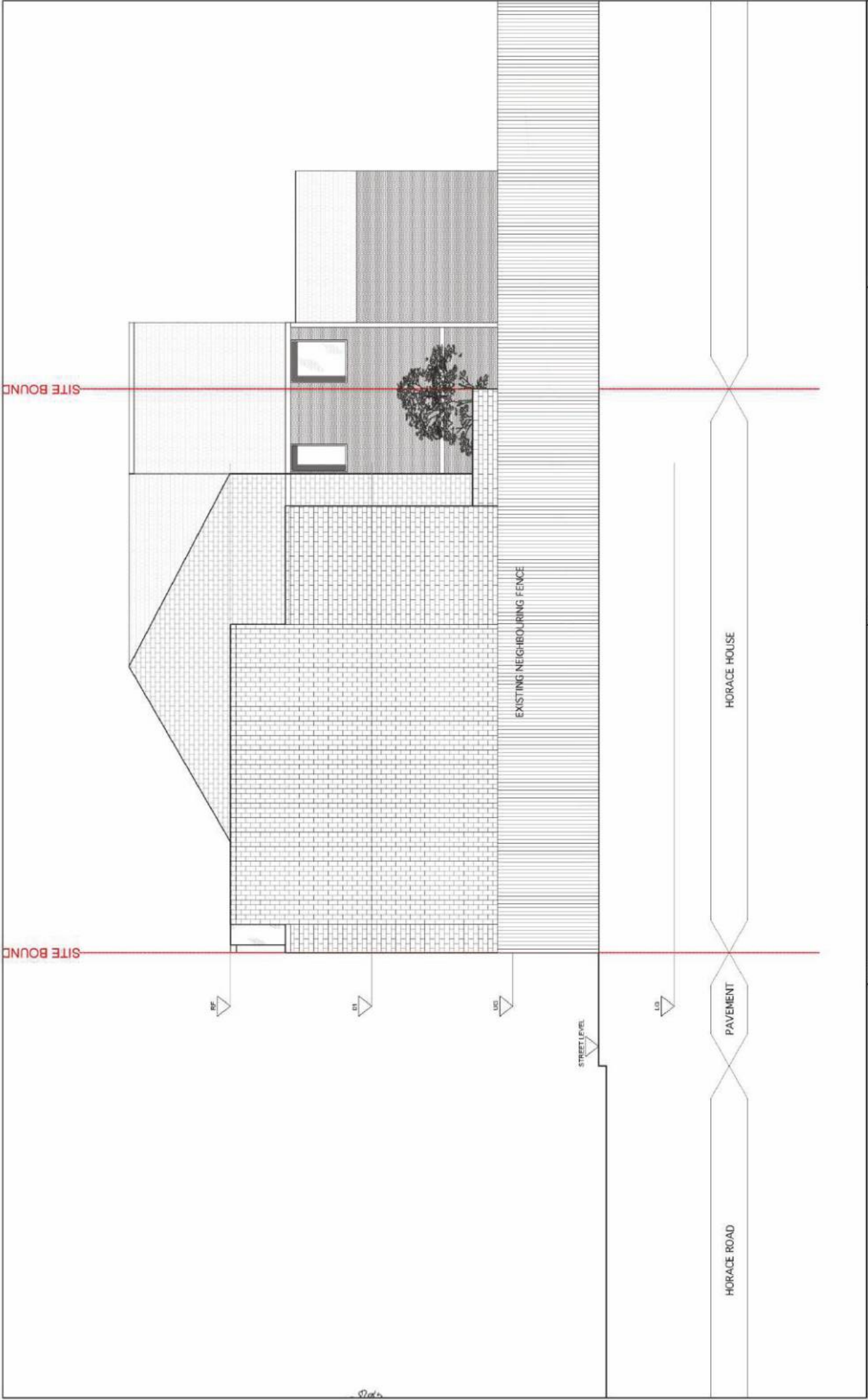
PAVEMENT



Project			
Horace Road E7 ODL			
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R E M I · C · T

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Project: Horace Road E7 ODL

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REMI·C·T

North

Drawing Title	Proposed West Elevation	Drawing Number	Date
			18/01/2021

Scale: 1:100

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APPENDIX 2

VSC Waldram Diagrams for applicable windows.



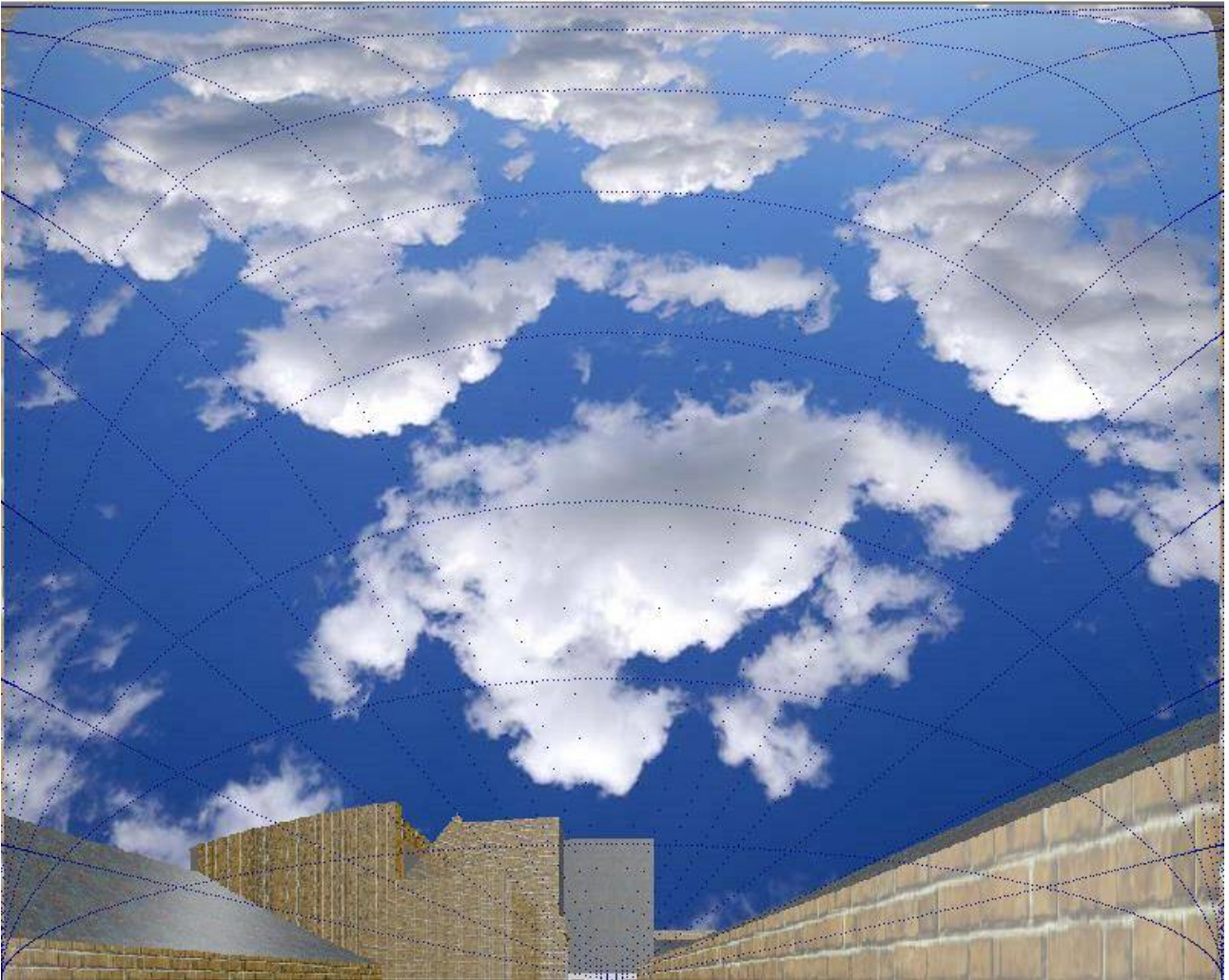


Fig 1. Waldram Diagram for Window 3.

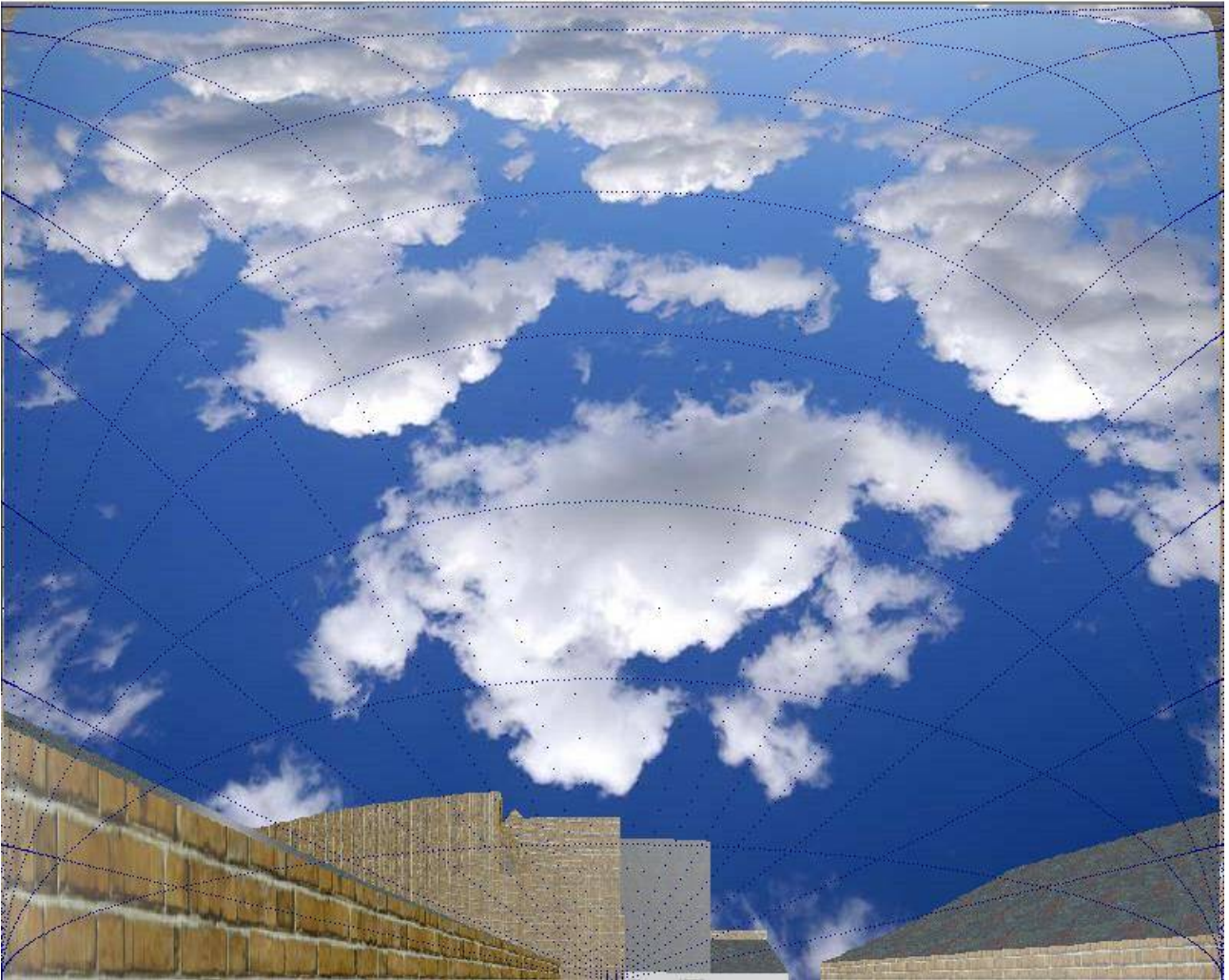


Fig 2. Waldram Diagram for Window 4.

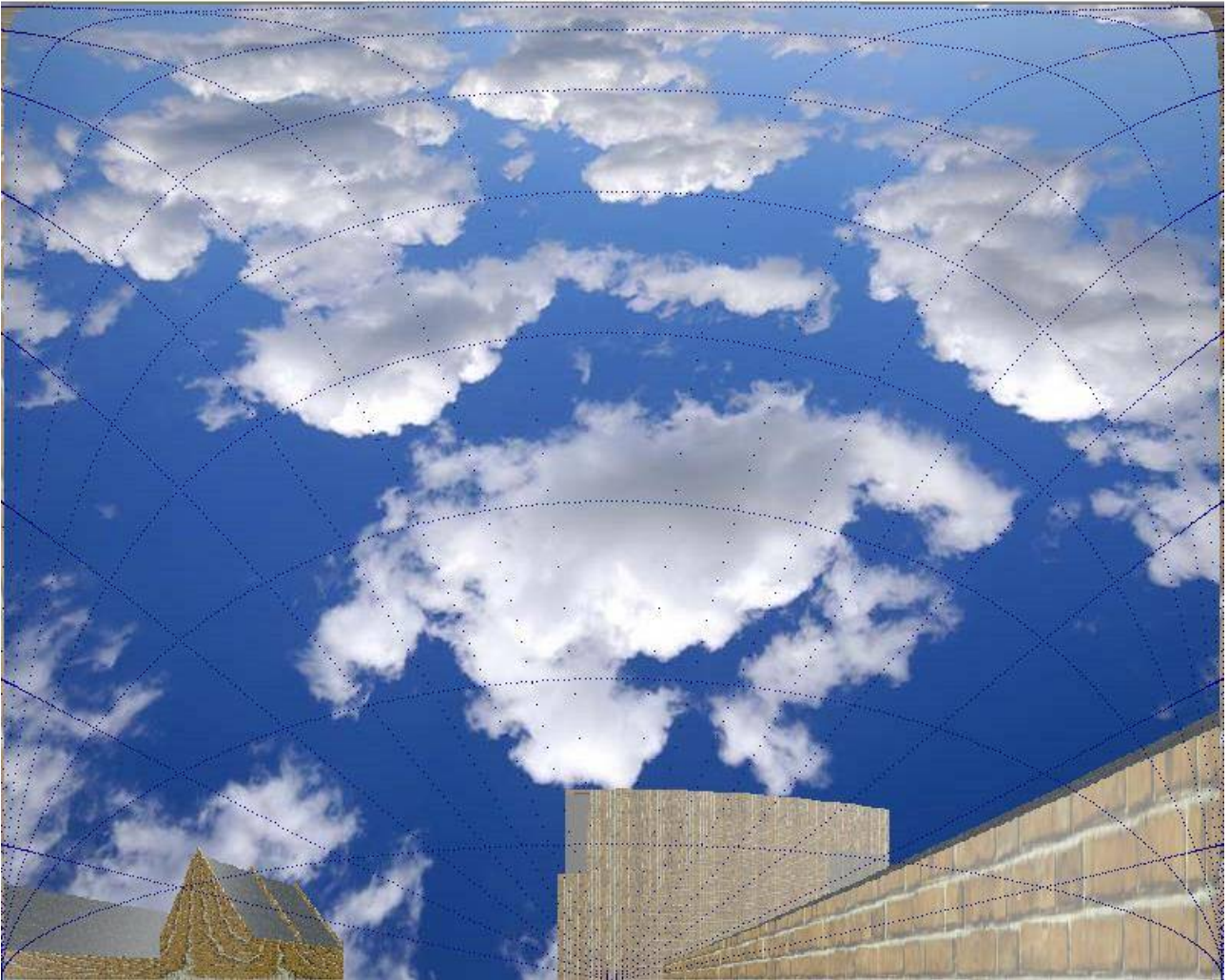


Fig 3. Waldram Diagram for Window 7.

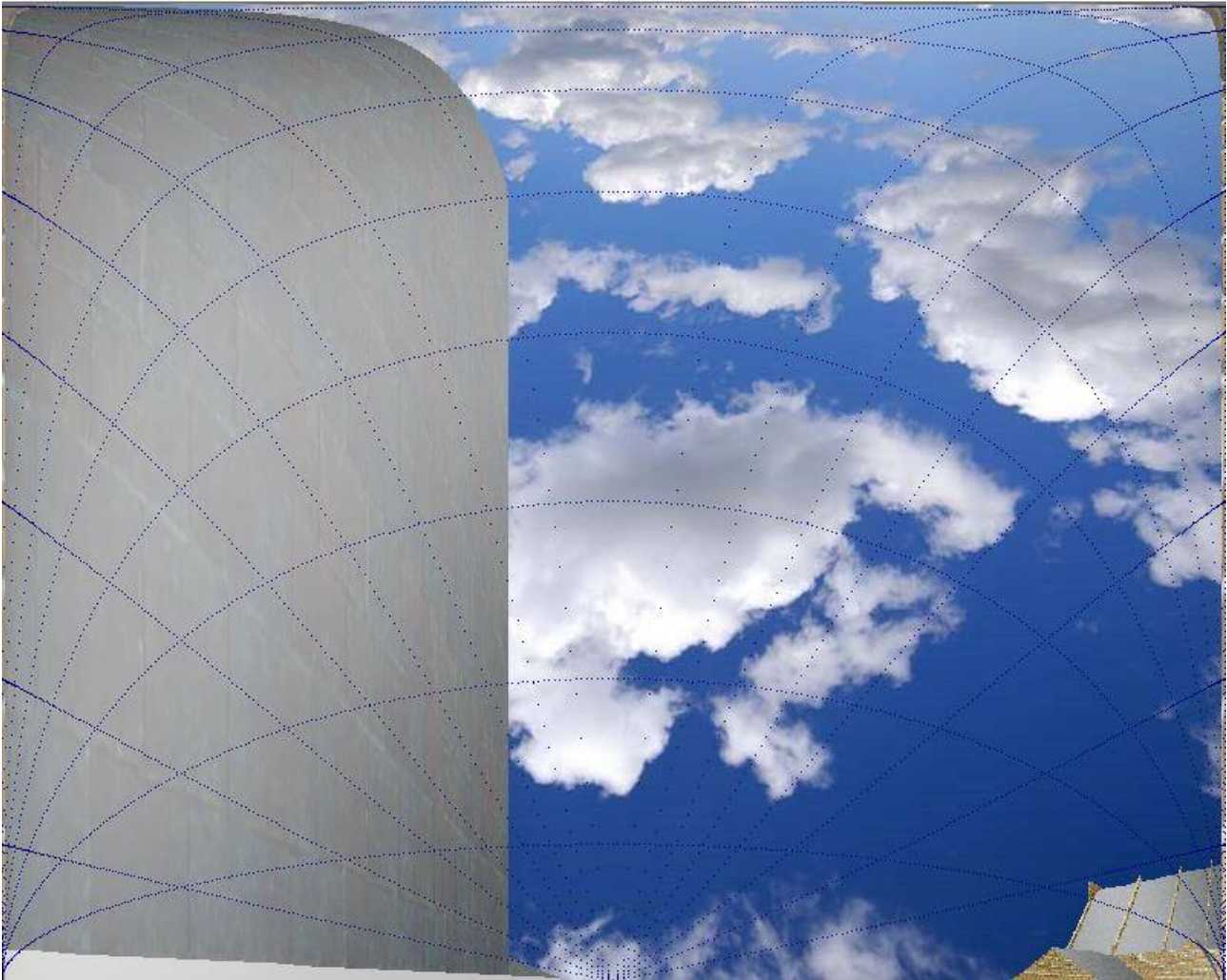


Fig 4. Waldram Diagram for Window 8.

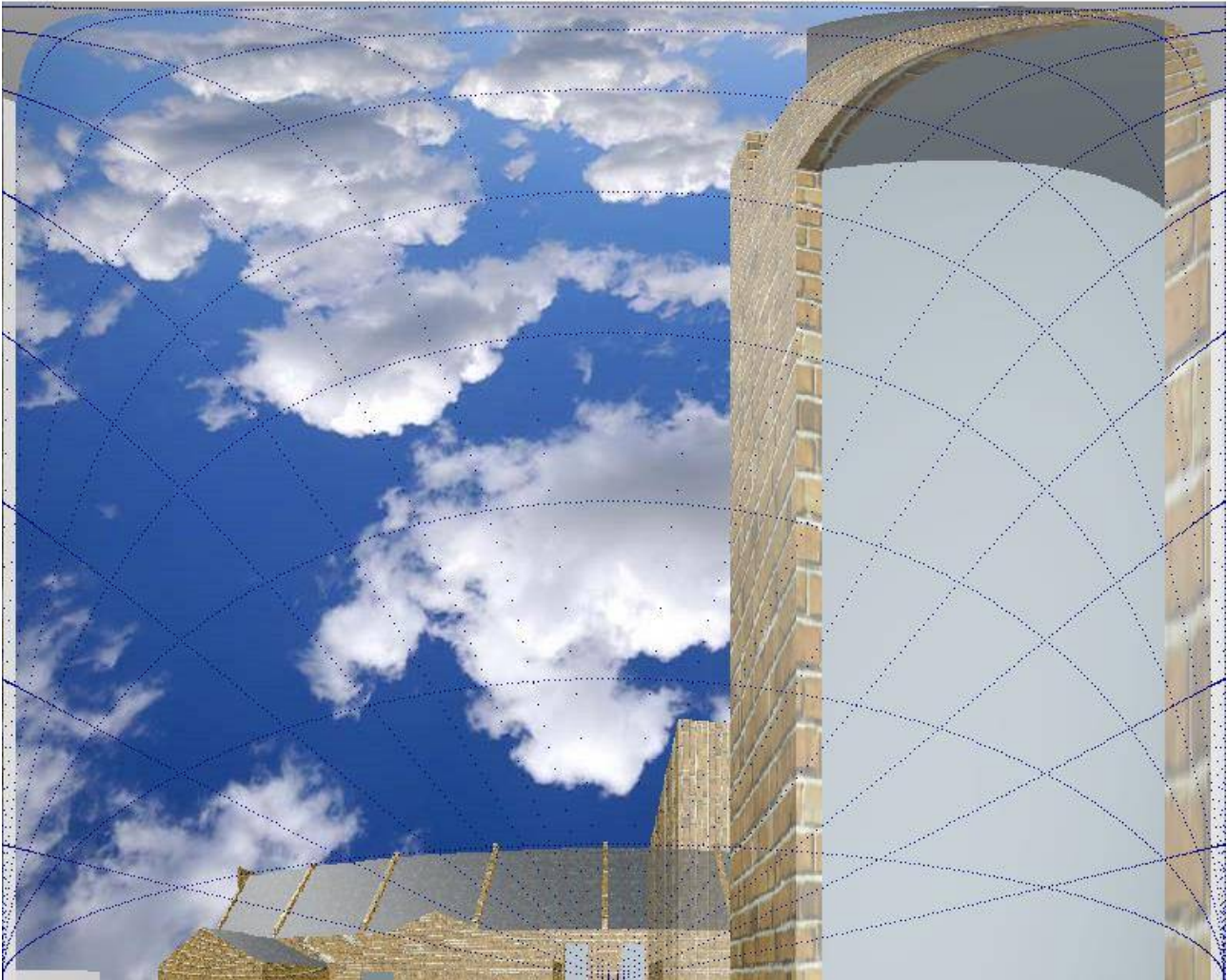


Fig 5. Waldram Diagram for Window 9.

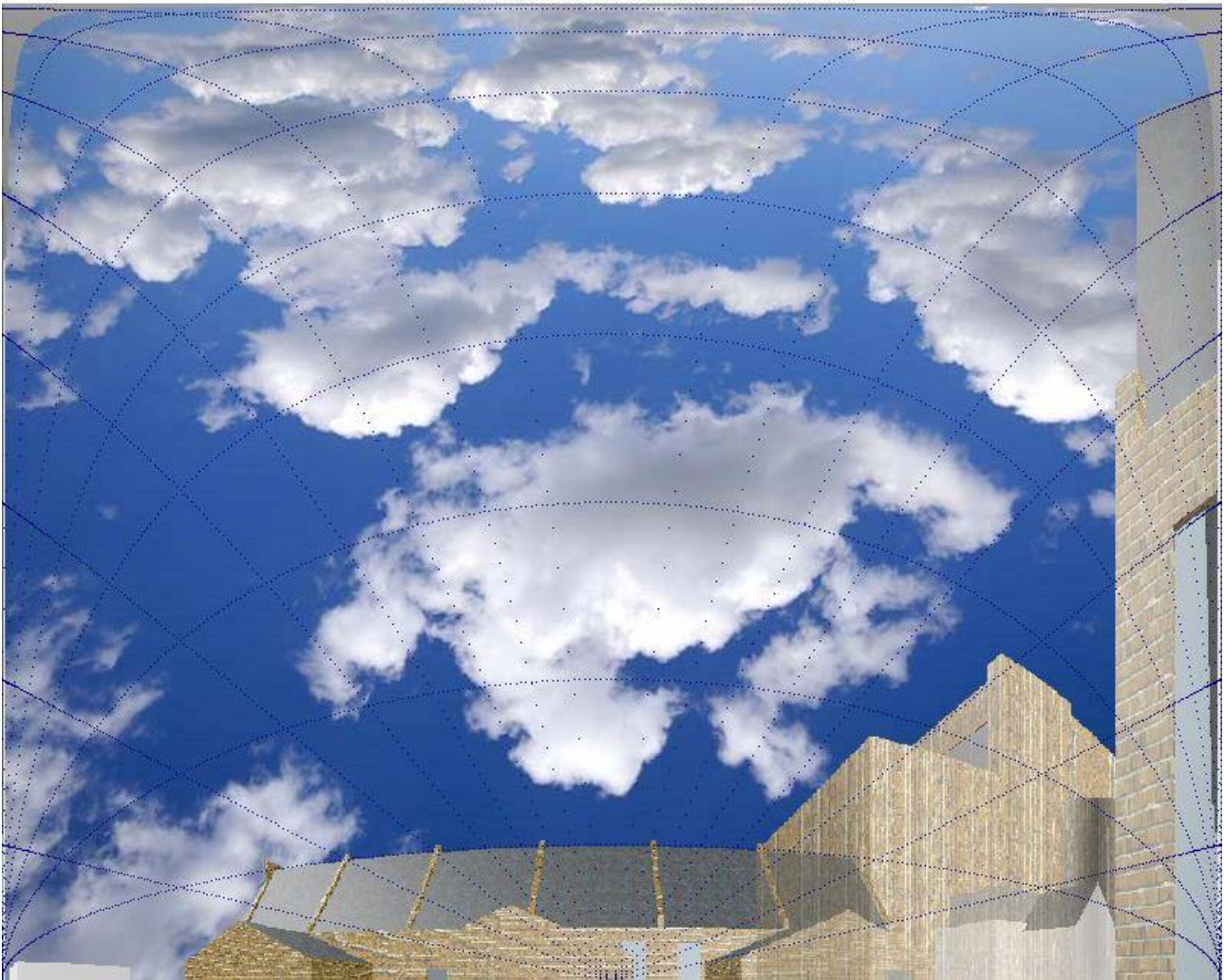


Fig 6. Waldram Diagram for Window 10.

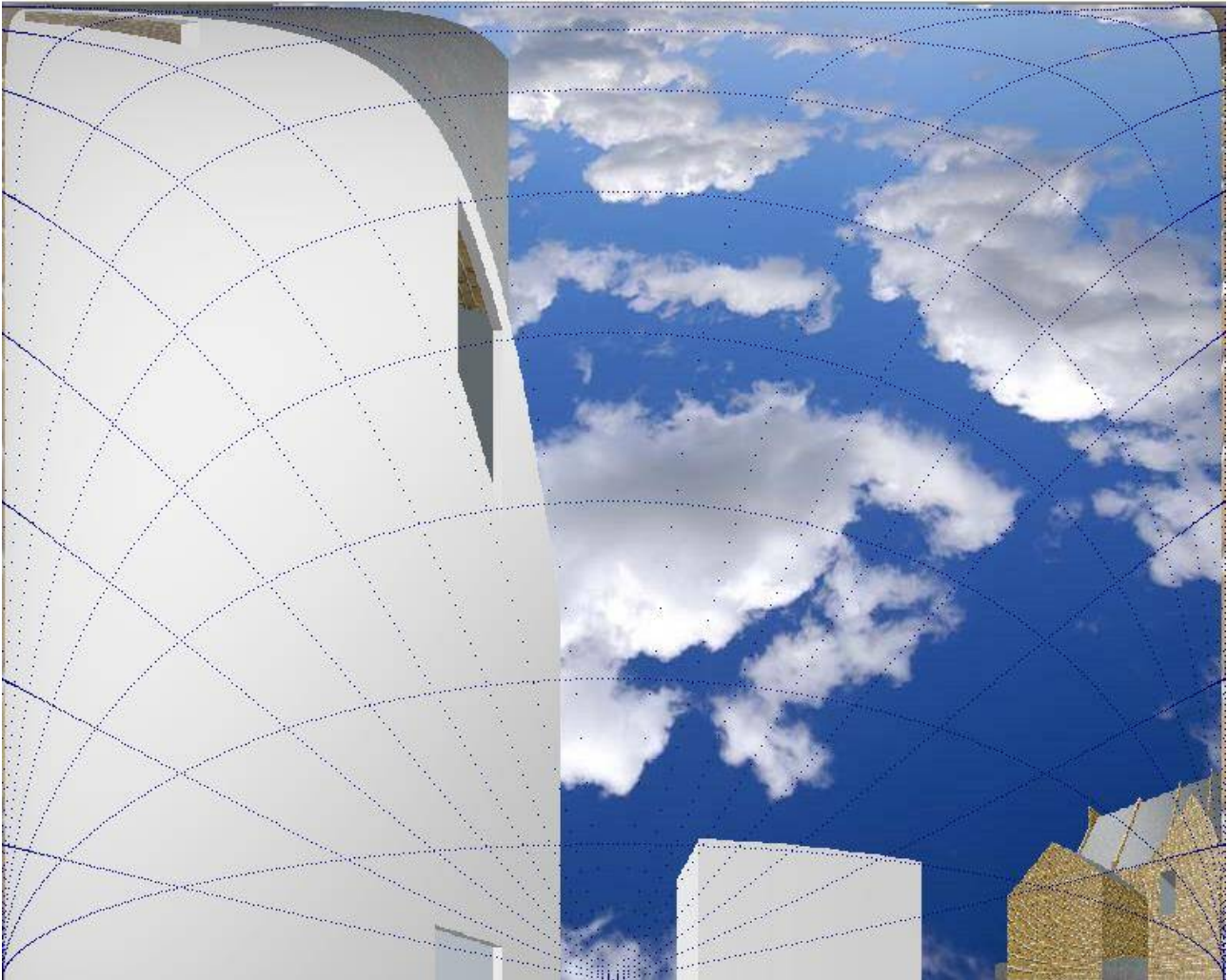


Fig 7. Waldram Diagram for Window 11.

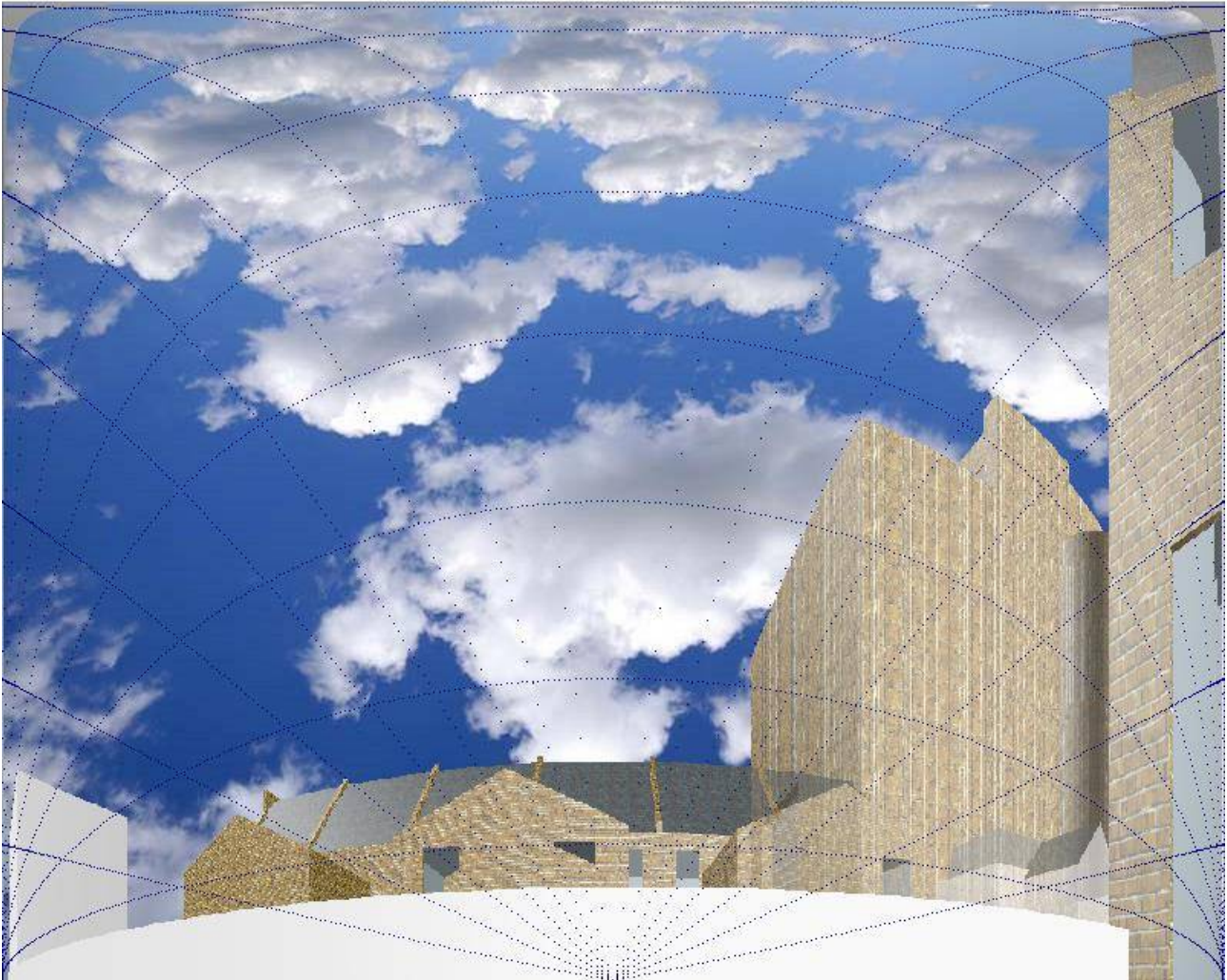


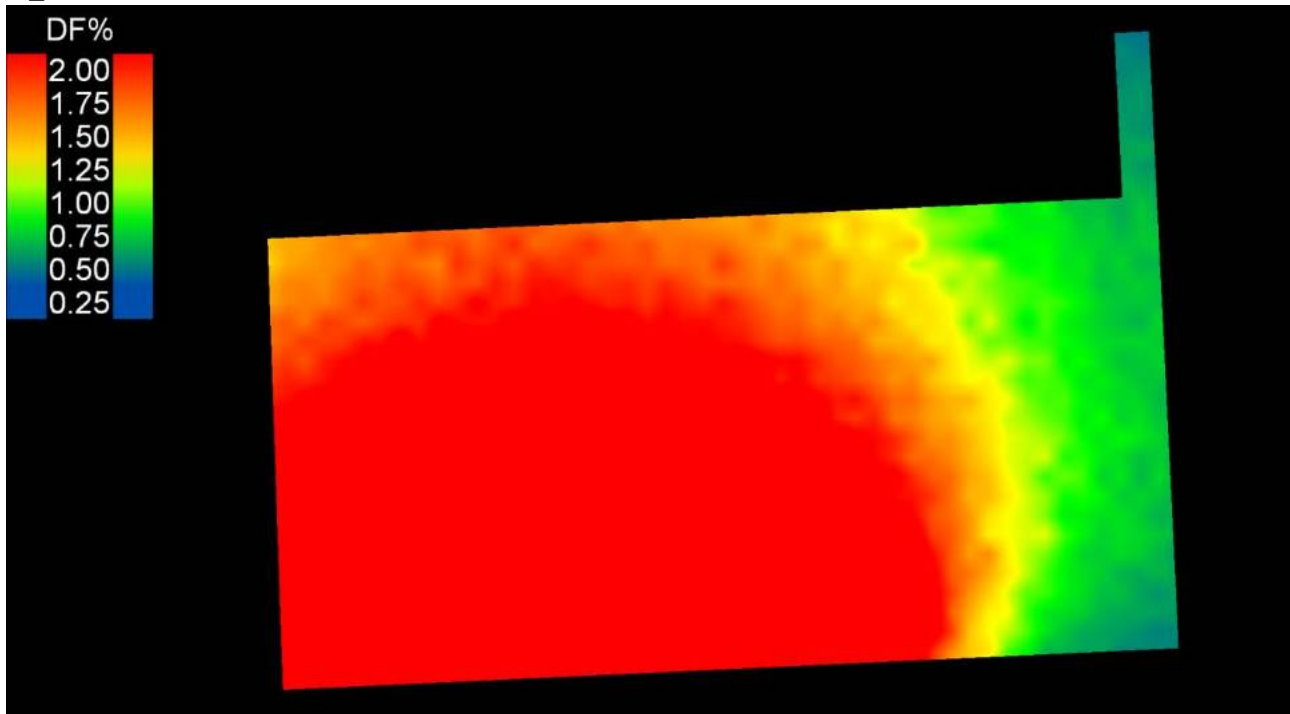
Fig 8. Waldram Diagram for Window 12.

APPENDIX 3

Average Daylight Factor (ADF) gradient maps.



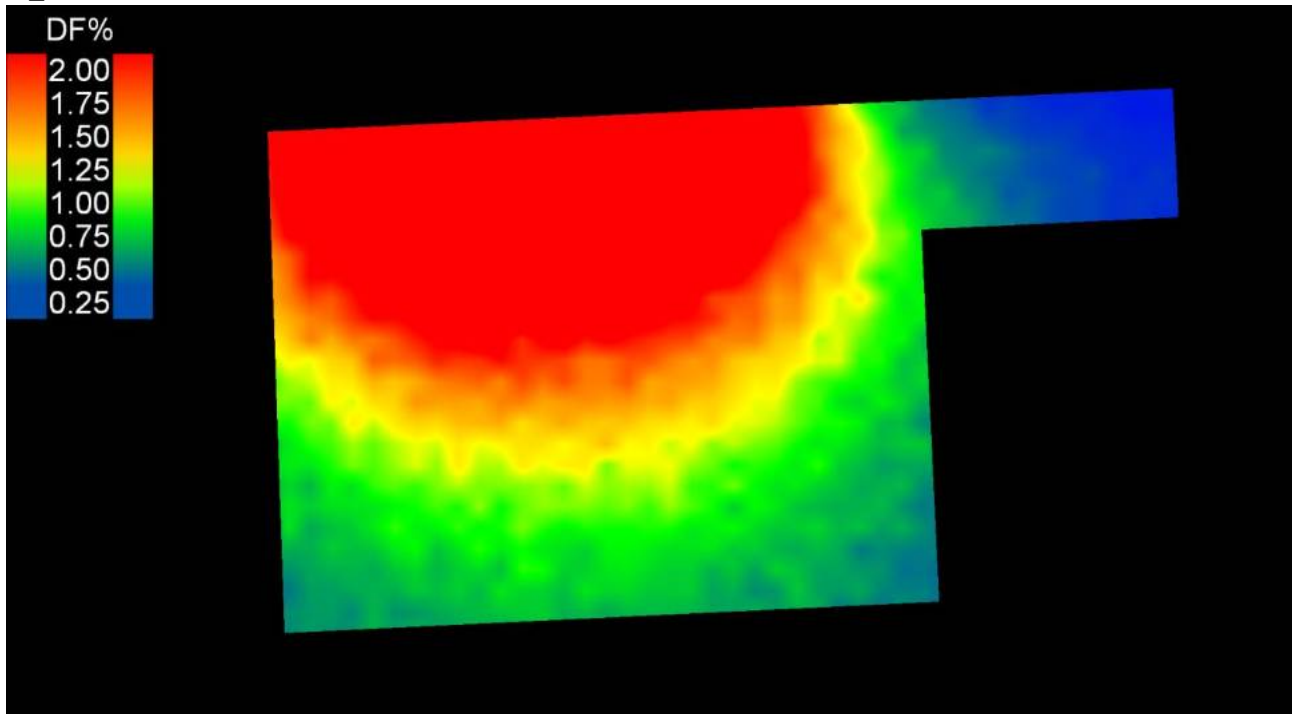
w_bedroom 1



Default

Average	$D_{average}$	2.88 DF[%]
Median	D_{median}	2.02 DF[%]
Minimum	D_{min}	0.39 DF[%]
Maximum	D_{max}	12.21 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.1343
Uniformity 2	D_{min}/D_{max}	0.0317

w_bedroom 2



Default

Average	D_{average}	1.68 DF[%]
Median	D_{median}	1.08 DF[%]
Minimum	D_{min}	0.07 DF[%]
Maximum	D_{max}	7.75 DF[%]
Uniformity 1	$D_{\text{min}}/D_{\text{average}}$	0.0405
Uniformity 2	$D_{\text{min}}/D_{\text{max}}$	0.0088

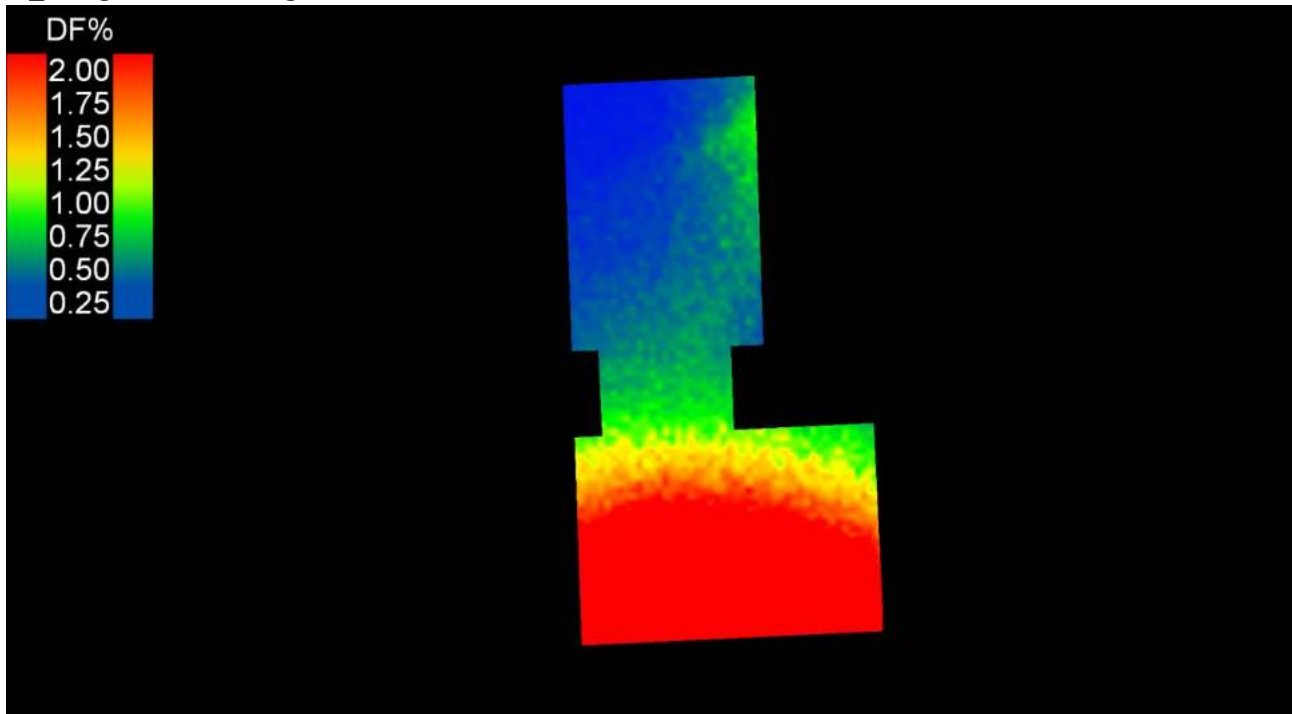
w_bedroom 3



Default

Average	$D_{average}$	7.69 DF[%]
Median	D_{median}	7.62 DF[%]
Minimum	D_{min}	4.72 DF[%]
Maximum	D_{max}	11.60 DF[%]
Uniformity 1	$D_{min}/D_{average}$	0.6142
Uniformity 2	D_{min}/D_{max}	0.4071

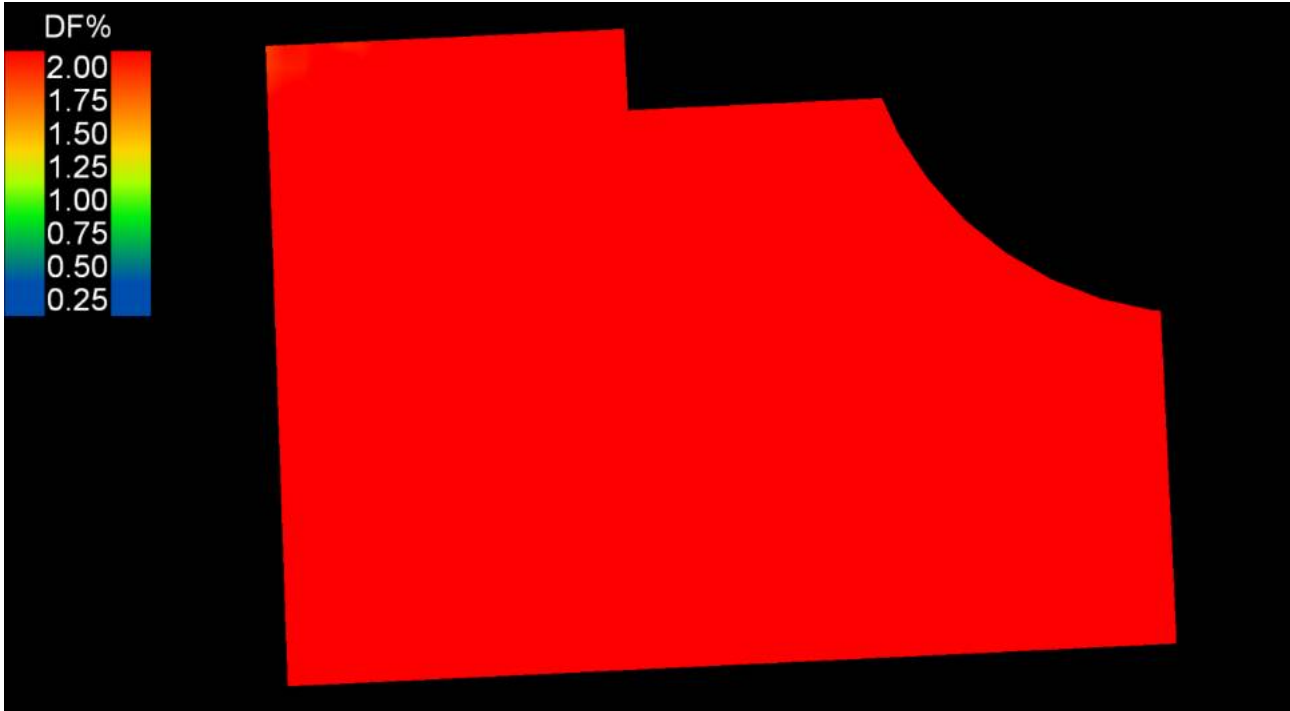
w_living kitchen dining



Default

Average	D_{average}	1.73 DF[%]
Median	D_{median}	0.82 DF[%]
Minimum	D_{min}	0.06 DF[%]
Maximum	D_{max}	9.87 DF[%]
Uniformity 1	$D_{\text{min}}/D_{\text{average}}$	0.0348
Uniformity 2	$D_{\text{min}}/D_{\text{max}}$	0.0061

w_studio/office



Default

Average	D_{average}	7.84 DF[%]
Median	D_{median}	6.43 DF[%]
Minimum	D_{min}	1.77 DF[%]
Maximum	D_{max}	19.98 DF[%]
Uniformity 1	$D_{\text{min}}/D_{\text{average}}$	0.2257
Uniformity 2	$D_{\text{min}}/D_{\text{max}}$	0.0886