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Planning Sunlight, Daylight and Overshadowing Report

At

No. 4 & 6 Manor Road
Teddington
TW11 8BG

for

Lulworth Homes

1st April 2016

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1 Introduction

1.1 The development site is situated at 4 & 6 Manor Road, Teddington TW11 8BG.

1.2 This report assesses the sunlight and daylight adequacy of the proposed habitable rooms at each floor level of the proposed dwellings at No. 6 Manor Road and to all habitable rooms at the proposed third floor level extension to No. 4 Manor Road. This report also assesses the overshadowing impact of the proposed development on to the existing amenity spaces surrounding the development site.

1.3 The development site at 4 & 6 Manor Road is shown outlined in red in Figure 1 below.

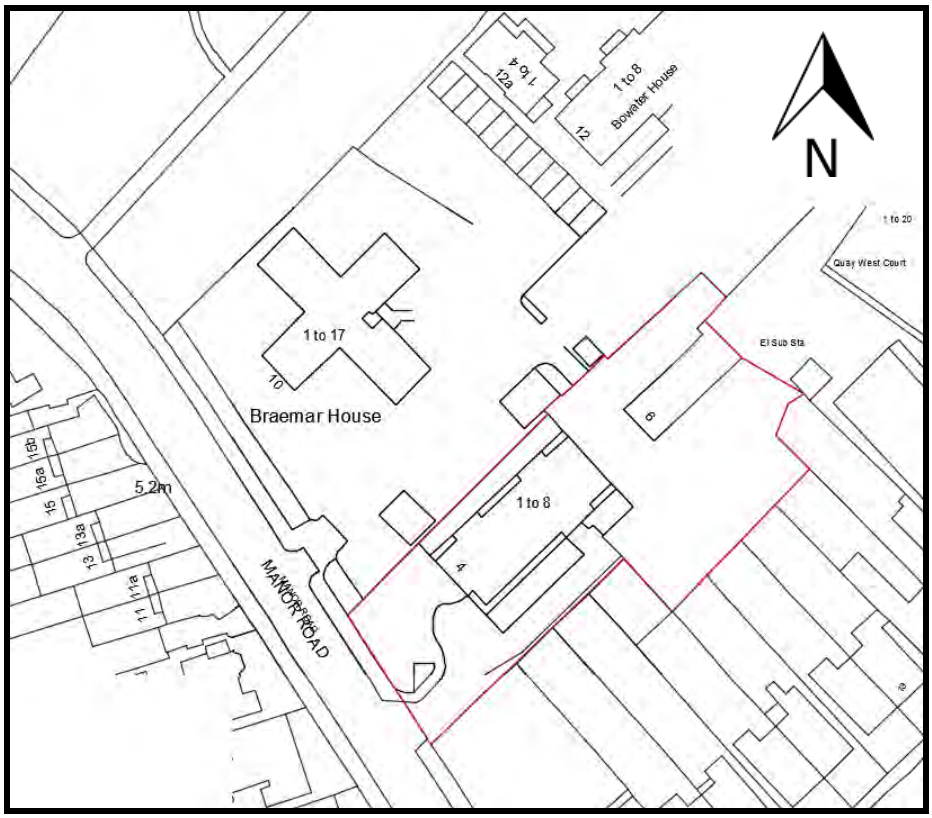

Figure 1. Existing Site Plan

2 The scope of this report

2.1 This report considers the sunlight, daylight and overshadowing issues against the criteria set out for national discretionary guidance in the publication Site Layout Planning for Daylight and Sunlight[1] (SLP) published by the Building Research Establishment in 2011. The document SLP refers both to particular amounts of daylight and sunlight and to a method of setting alternative target values for skylight. The Local Planning Authority (LPA) has not set such alternative target values.

The document SLP states in its own introduction on page 1 that:

"The advice given here is not mandatory and this document should not be seen as an instrument of planning policy"

2.2 Government policy has encouraged increases in density of development, in some cases significantly, since SLP was first published in 1991.

2.3 The British Standard current for this subject is BS 8206-2:2008 – code of practice for daylighting[2].

2.4 This report analyses the sunlight and daylight ADF levels to the proposed new dwellings within the development itself, in addition to overshadowing impact to existing surrounding amenity areas.

2.5 The sunlight and daylight impact to non-residential buildings are not considered in this report because sunlight and daylight levels within commercial buildings are not generally town-planning issues.

The analyses used in this chapter are:

[1] Littlefair, P.J (2011) Site Layout Planning for Daylight and Sunlight, A guide to good practice, BRE

[2] Lighting for Buildings. Code of Practice for Daylighting BS 8206-2: 2008, British Standards Institution, 2008

2.5.1 **For sunlight**: The sun light protractor method and sunlight availability indicator for 51.5° N as set out in Appendix A of SLP.

2.5.2 **For daylight to proposed**: The principles set out in section 2 of SLP together with the concept of average daylight factor (***ADF)*** as set out in both Appendix C of SLP - interior daylighting recommendations – and in BS 8206-2:2008:code of practice for daylighting.

2.5.3 **For shadow paths**: The proposals are digitally modelled in Integrated Environmental Solutions' (IES) ModelIT software and then analysed in IES suncast, version 2015.1.0.0. Shadows are predicted at hourly intervals on the equinox date, 21st March, in accordance with the BRE criteria.

3 Methodology

3.1 For Sunlight at a Building

3.1.1 The methodology used is that of the sun light protractor method and sunlight availability indicator for 51.5° N as set out in Appendix A of Site Layout Planning for daylight and sunlight: A guide to good practice (SLP).

3.1.2 This method considers sunlight at a reference point. On looking out from the reference point, the angular size of an obstructing building is assessed by reference to its ratio of Distance/Height relative to the reference point. The composite obstruction profile is plotted using this ratio. The resultant plot of obstructions for any given reference point is then overlaid on the Building Research Establishment (BRE) sunlight availability indicator for 51.5 degrees north.

3.1.3 The concept of available sunlight takes into account the probability of cloud obscuring the sun from a given reference point in addition to the change of sunrise and sunset times. Very approximately at 51.5 degrees north, BRE

anticipate an average of 4 hours and 4 minutes of sunlight per day throughout the year on the basis only of cloud as an obstruction. The sunlight indicator takes into account the lower sun angles of the winter months.

3.1.4 The resultant assessment provides a percentage of annual probable sunlight hours at a given point. This assessment is for sunlight on the outside face of a building.

3.1.5 The recommended levels of sunlight stated in BS code of practice is given as:

"Interiors in which the occupants have a reasonable expectation of direct sunlight and should receive at least 25% of probable sunlight hours."

3.1.6 BRE discretionary guidance states that on a window wall facing within 90 degrees of due south there will be adequate potential for sunlight if the reference point receives at least 25% of annual probable sunlight hours, including at least 5% of probable sunlight hours during the winter months (21st September to 21st March). If the subject window receives less than 0.8 times its former sunlight hours during either period (a reduction greater than 20% with the development in place), and has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours, then the reduction may be noticeable to the occupants.

There is a rider to the above which states:

"The degree of satisfaction is related to the expectations of sunlight. If a room is necessarily north facing or if the building is in a densely-built urban area, the absence of sunlight is more acceptable than when its exclusion seems arbitrary."

3.1.7 There is no requirement for a dwelling to receive sunlight, and of course many do not. The BRE guidance suggests that sunlight assessments

should only be made for windows, or walls in which there are windows, that face within 90° of due south. Therefore there is no requirement to assess north-facing windows.

3.2 **For Sunlight at an Open Space**

3.2.1 The test used is as set out by BRE in SLP as a simple statement. This is determined only by the presence or absence of a physical obstruction to sunlight. The concept of annual probable hours is not used. An assessment is made of sunlight reaching the subject space at the equinox dates of 21st March and 21st September.

3.3 **For Shadow Paths**

3.3.1 The proposals are digitally modelled in Integrated Environmental Solutions' (IES) ModelIT software and then analysed in IES suncast, version v6.4 Shadows are predicted at hourly intervals on 21st March the equinox month.

3.3.2 For overshadowing, the BRE guidance suggests for an amenity area, like a garden, to appear sunlit throughout the year, at least 50% of the garden or amenity area should receive 2 hours of sunlight on 21st March (21st March is the equinox month and is the set day for testing overshadowing in accordance with the BRE criteria). If a new development causes overshadowing of existing open areas that do not meet these criteria and the area which can receive 2 hours of sun on 21st March reduce by more than 20% of its former value, then the loss of sunlight may be noticeable, representing an adverse impact. This assessment would be analysed by producing a shadow path analysis from a computer simulation of the proposed development.

3.4 For Daylight at a Building

3.4.1 The daylight VSC procedure is, as with the sunlight analysis, to calculate in terms of the Distance/Height ratio all physical obstructions to light paths with reference to a subject position. These obstructions are then plotted against the light distribution from a CIE Standard Overcast Sky[3] as defined by the Commission Internationale de l'Eclairage (CIE).

3.4.2 The resulting daylight level at the external face of the building can then be computed. This is known as the Vertical Sky Component (VSC). The parameters of window size, glass transmissivity, room size and internal surface reflectances are then evaluated against the VSC for the window location. The resulting assessment gives a measure of internal daylight as a *df* value known as Average Daylight Factor.

3.4.3 The approach advocated by SLP, but not by BS 8206-2:2008, is to use only the external VSC measurement at an existing surrounding property. However, as stated above, this approach does not consider any of the window or room qualities, including window sizes.

3.4.4 The Average Daylight Factor tests takes into account window size, room size, and internal reflectances in addition to external light levels at the window. VSC is a measurement made externally only and does not describe daylight conditions internally.

3.4.5 The suggested average daylight factor levels in SLP are:

- Bedrooms 1.0%df
- Living Room 1.5%df

[3] This is a completely overcast sky, the mathematical definition of which is given at Appendix H of SLP as a luminance ratio.

- Kitchens 2.0%df
- Living/Kitchens 2.0%df

The assessment of adequate light internally in general relates to the quantum of light remaining as set out in BS 8206-2:2008 (in this instance measured as average daylight factor – *adf*) rather than how much light is taken away.

4 The Scheme

4.1 The proposed scheme consists of a single storey extension on top of the existing three storey block at No. 4 Manor Road, and the development of a new three storey block of flats on the site of No. 6 Manor Road.

4.2 The studies have been based on the drawings listed below for the proposed scheme prepared by Brookes Architects and dated August and September 2015:

Drawing Title:	Drawing No. and Revision:
Site and Context plan	4707_3_50 - Rev0
Ground Floor Plan	4707_3_52 - Rev0
First and Second Floor Plans	4707_3_53 - Rev0
Third Floor & Roof Plans	4707_3_54 - Rev0
East and West Elevations	4707_3_60 - Rev0
South Elevation	4707_3_61 - Rev0
North Elevation	4707_3_62 - Rev0
Contextual Sections	4707_3_65 - Rev0
Section A-A	4707_3_32 - Rev0

5 Description of the Surroundings

5.1 To the north-west of the site there is a residential property known as Braemer House which is approximately 4 storeys in height. To the north of the site are further residential properties at Bowater House, which are situated beyond a car park which separates the buildings from the development site at No. 6 Manor Road. To the north-east and south of the site there are further residential properties which are accessed off Ferry Road.

6 Sunlight

6.1 We have tested the sunlight levels at the key habitable rooms of the proposed third floor roof extension to No. 4 Manor Road, and the proposed habitable rooms at ground, first and second floor levels at the proposed development at No. 6 Manor Road.

6.2 The location of each assessment at the proposed development is shown in Figures 1, 2 & 3 at Appendix 1. The sunlight assessment has been carried out with the existing buildings in place.

6.3 In accordance with the BRE discretionary guidance, tress, in particular deciduous trees, need not be considered in the assessment because their shape and size changes throughout the year. Therefore the assessments carried out need not take into consideration the relocated deciduous Hornbeam tree. However, we have considered the proposed 7m tall screen of evergreen Lawson Cyprus trees positioned to the south east of the site as shown in Appendix 1, Figure 4.

6.4 In accordance with the BRE discretionary guidance, there is no sunlight requirement for windows that face within 90 degrees of due north. The

orientation of the buildings are such that 36 of the proposed windows are within 90 degrees of due north and therefore have no set requirements for sunlight in accordance with the BRE recommendations.

6.5 The assessment results show that all of the proposed rooms would meet the BRE criteria for sunlight both annually and in winter.

6.6 The Sunlight assessment results are shown in Table 1 at Appendix 2.

7 Overshadowing

7.1 The BRE guidance suggests for an amenity area, such as a garden, to appear sunlit throughout the year, at least 50% of the garden or amenity area should receive 2 hours of sunlight on 21st March (21st March is the equinox month and is the set day for testing overshadowing in accordance with the BRE criteria). If a new development causes overshadowing of existing open areas that do not meet these criteria and the area which can receive 2 hours of sun on 21st March reduces by more than 20% of its former value, then the loss of sunlight may be noticeable, representing an adverse impact. Amenity areas include:

- Gardens, usually the main or back garden of a house and allotments
- Parks and playing fields
- Children's playgrounds
- Outdoor swimming pools and paddling pools

- Sitting-out areas, such as those between non-domestic buildings and public squares

- Focal points for views, such as a group monument or fountains.

7.2 We have carried out a shadow path analysis of the proposed scheme at 4 & 6 Manor Road, and the resulting shadow path is shown on a sequence of plans at Appendix 3 to this report. The shadow path studies have been carried out on 21st March, at 1 hour intervals between 8am and 6pm. The 21st March is the set day for testing overshadowing from a new building in accordance with the BRE criteria.

7.3 The results of the shadow path analysis demonstrate that following development there will be no adverse overshadowing impact to any existing amenity areas adjacent to the site.

7.4 Therefore, in accordance with the BRE guidelines the proposed scheme at 4 & 6 Manor Road would meet the BRE recommendations for overshadowing.

8 Daylight

8.1 In accordance with the BRE assessment methodology, we have assessed the daylight Average Daylight Factor (ADF) levels within the proposed habitable rooms at the proposed roof extension to No. 4 Manor Road, and the proposed habitable rooms at No. 6 Manor Road. The assessment considers the impact of the immediate surroundings on the key rooms within the proposed dwellings.

8.2 The Average Daylight Factor tests takes into account window size, room size, and internal reflectance in addition to external light levels at the window known as the Vertical Sky Component (VSC).

8.3 The BRE discretionary guidance for daylight ADF to proposed habitable rooms following development is a minimum of:

- 1.0% ADF for a Bedroom
- 1.5% ADF for a Living Room
- 2.0% ADF for a Kitchen or combined Kitchen and Living Room

8.4 We have taken daylight ADF assessments at all proposed key rooms that may be affected by the existing surrounding buildings. The test locations are shown in Figures 1, 2 & 3 at Appendix 1 of this report and the results of the daylight ADF assessments are shown in Table 2 at Appendix 2.

8.5 Following development the tested rooms at proposed third floor level at 4 Manor Road, and the proposed rooms at ground, first and second floor levels at 6 Manor Road would receive daylight ADF levels which would meet and exceed the BRE and British Standards recommendations.

9 Conclusion

9.1 We have carried out the Sunlight, Daylight and Overshadowing assessments on the key habitable rooms within the proposed roof extension to No. 4 Manor Road, and the proposed development at No. 6 Manor Road.

9.2 The results of the daylight ADF assessments taken at all habitable rooms within the proposed development demonstrate that all of the tested habitable rooms will receive daylight ADF levels that would meet and exceed the BRE recommendations required for the specific room type.

9.3 The results of the Sunlight assessments taken at all habitable rooms of the proposed development demonstrates that all of the tested habitable room will

receive good levels of sunlight both annually and in winter in accordance with the BRE recommendations for sunlight.

9.4 The Overshadowing analysis demonstrates that following development of the proposed roof extension to No. 4 Manor Road, and the proposed development at No. 6 Manor Road there would be no adverse overshadowing impact to the proposed rear gardens or any other amenity areas adjacent to the development site.

9.5 Therefore, the proposed development at No. 4 Manor Road and No. 6 Manor Road would meet the BRE criteria for Sunlight, Daylight and Overshadowing.

1st April 2016

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Appendix 1

Assessment Location Plans

Figure 1 – Sunlight and Daylight Assessment Location Plan at Proposed Third Floor Level at 4 Manor Road

Figure 2 – Sunlight and Daylight Assessment Location Plan at Proposed 6 Manor Road at Ground and First floor level

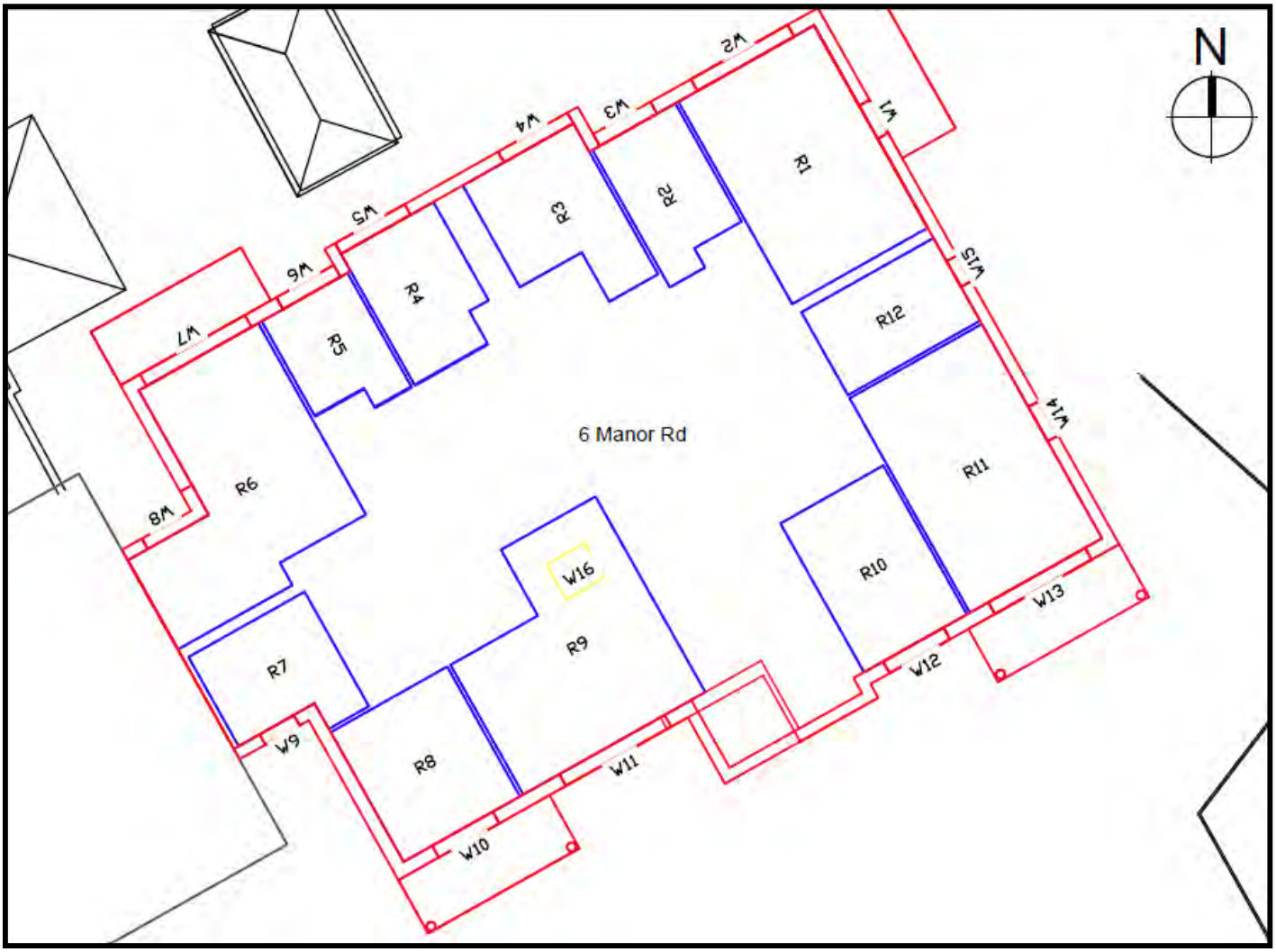


Figure 3 – Sunlight and Daylight Assessment Location Plan at Proposed 6 Manor Road at Second floor level

Figure 4 – Sunlight and Daylight Assessment Location Plan with evergreen Lawson Cyprus Trees in place

Appendix 2
Sunlight and
Daylight Results
Tables

Project Name: 4&6 Manor Road
Project No: 6155
Report Title: Sunlight Results for Proposed Development at 4 & 6 Manor Road

Date of Analysis: 04/01/2016

Floor Ref.	Room Ref.	Room Use.	Window Ref.	Scenario	Available Sunlight Hours		
					Annual %	Winter %	Room Pass
4 Manor Road							
Third	R1	Bedroom	W1	Proposed	*North Facing		PASS
Third	R2	Bedroom	W2	Proposed	*North Facing		PASS
Third	R3	Bedroom	W3	Proposed	*North Facing		PASS
Third	R4	Bedroom	W4	Proposed	*North Facing		PASS
Third	R5	Bedroom	W5	Proposed	*North Facing		PASS
Third	R6	Bedroom	W6	Proposed	*North Facing		PASS
Third	R7	LKD	W7	Proposed	47	36	PASS
Third	R7	LKD	W8	Proposed	46	23	
Third	R8	LKD	W9	Proposed	70	35	PASS
Third	R8	LKD	W10	Proposed	65	23	
Third	R9	Kitchen	W11	Proposed	41	18	PASS
Third	R10	Living Room	W12	Proposed	52	25	PASS
6 Manor Road							
Ground	R1	LK	W1	Proposed	*North Facing		PASS
Ground	R1	LK	W2	Proposed	*North Facing		
Ground	R2	Bedroom	W3	Proposed	*North Facing		PASS
Ground	R3	Bedroom	W4	Proposed	*North Facing		PASS
Ground	R4	Bedroom	W5	Proposed	*North Facing		PASS
Ground	R5	Bedroom	W6	Proposed	*North Facing		PASS

Project Name: 4&6 Manor Road
Project No: 6155
Report Title: Sunlight Results for Proposed Development at 4 & 6 Manor Road

Date of Analysis: 04/01/2016

Floor Ref.	Room Ref.	Room Use.	Window Ref.	Scenario	Available Sunlight Hours		
					Annual %	Winter %	Room Pass
Ground	R6	LK	W7	Proposed	*North Facing		PASS
Ground	R6	LK	W8	Proposed	*North Facing		
Ground	R7	Bedroom	W9	Proposed	43	22	PASS
Ground	R8	Bedroom	W10	Proposed	37	14	PASS
Ground	R9	LK	W11	Proposed	35	23	PASS
Ground	R10	Bedroom	W12	Proposed	30	23	PASS
Ground	R11	LK	W13	Proposed	16	17	PASS
Ground	R11	LK	W14	Proposed	20	5	
Ground	R12	Bedroom	W15	Proposed	*North Facing		PASS
First	R1	LK	W1	Proposed	*North Facing		PASS
First	R1	LK	W2	Proposed	*North Facing		
First	R2	Bedroom	W3	Proposed	*North Facing		PASS
First	R3	Bedroom	W4	Proposed	*North Facing		PASS
First	R4	Bedroom	W5	Proposed	*North Facing		PASS
First	R5	Bedroom	W6	Proposed	*North Facing		PASS
First	R6	LK	W7	Proposed	*North Facing		PASS
First	R6	LK	W8	Proposed	*North Facing		
First	R7	Bedroom	W9	Proposed	38	21	PASS
First	R8	Bedroom	W10	Proposed	40	25	PASS

Project Name: 4&6 Manor Road
Project No: 6155
Report Title: Sunlight Results for Proposed Development at 4 & 6 Manor Road

Date of Analysis: 04/01/2016

Floor Ref.	Room Ref.	Room Use.	Window Ref.	Scenario	Available Sunlight Hours		
					Annual %	Winter %	Room Pass
First	R9	LK	W11	Proposed	57	24	PASS
First	R10	Bedroom	W12	Proposed	66	25	PASS
First	R11	LK	W13	Proposed	79	36	PASS
First	R11	LK	W14	Proposed	38	6	
First	R12	Bedroom	W15	Proposed	*North Facing		PASS
Second	R1	LK	W1	Proposed	*North Facing		PASS
Second	R1	LK	W2	Proposed	*North Facing		
Second	R2	Bedroom	W3	Proposed	*North Facing		PASS
Second	R3	Bedroom	W4	Proposed	*North Facing		PASS
Second	R4	Bedroom	W5	Proposed	*North Facing		PASS
Second	R5	Bedroom	W6	Proposed	*North Facing		PASS
Second	R6	LK	W7	Proposed	*North Facing		PASS
Second	R6	LK	W8	Proposed	*North Facing		
Second	R7	Bedroom	W9	Proposed	31	16	PASS
Second	R8	Bedroom	W10	Proposed	35	14	PASS
Second	R9	LK	W11	Proposed	71	22	PASS
Second	R9	LK	W16	Proposed	*North Facing		
Second	R10	Bedroom	W12	Proposed	61	25	PASS
Second	R11	LK	W13	Proposed	43	23	PASS
Second	R11	LK	W14	Proposed	22	6	
Second	R12	Bedroom	W15	Proposed	*North Facing		PASS

Table 1 - Sunlight results to the Proposed Habitable Rooms at 4 & 6 Manor Road

Project Name: 4&6 Manor Road
Project No: 6155
Report Title: Daylight Results for Proposed Development at 4 & 6 Manor Road

Floor	Room	Room Use.	Window	Glazed Area	ADF Proposed	Req'd Value	Pass/Fail
4 Manor Road							
Third	R1	Bedroom	W1-L	0.79	0.10		
			W1-U	2.28	1.59		
					1.69	1	PASS
Third	R2	Bedroom	W2	1.70	2.36		
					2.36	1	PASS
Third	R3	Bedroom	W3	1.90	1.95		
					1.95	1	PASS
Third	R4	Bedroom	W4	1.90	1.32		
					1.32	1	PASS
Third	R5	Bedroom	W5	1.71	2.04		
					2.04	1	PASS
Third	R6	Bedroom	W6-L	0.54	0.09		
			W6-U	2.41	2.14		
					2.22	1	PASS
Third	R7	LKD	W7-L	1.09	0.09		
			W7-U	2.43	0.99		
			W8-L	1.56	0.12		
			W8-U	3.49	1.44		
					2.63	2	PASS
Third	R8	LKD	W10-L	1.31	0.09		
			W10-U	2.91	1.03		
			W9-L	1.56	0.11		
			W9-U	3.49	1.27		
					2.50	2	PASS
Third	R9	Kitchen	W11-L	0.97	0.16		
			W11-U	2.16	1.86		
					2.02	2	PASS
Third	R10	Living Room	W12-L	1.54	0.16		
			W12-U	3.43	1.91		
					2.08	1.5	PASS
6 Manor Road							
Ground	R1	LK	W1-L	0.69	0.05		
			W1-U	1.25	0.35		
			W2-L	2.01	0.20		
			W2-U	3.56	2.35		
					2.94	2	PASS
Ground	R2	Bedroom	W3	1.73	1.93		
					1.93	1	PASS

Ground	R3	Bedroom	W4	2.09	2.16		
					2.16	1	PASS
Ground	R4	Bedroom	W5	2.12	2.52		
					2.52	1	PASS
Ground	R5	Bedroom	W6	1.57	1.83		
					1.83	1	PASS
Ground	R6	LK	W7-L	2.23	0.14		
			W7-U	3.87	1.06		
			W8-L	1.21	0.06		
			W8-U	2.11	0.74		
					2.00	2	PASS
Ground	R7	Bedroom	W9-L	0.72	0.08		
			W9-U	1.25	0.97		
					1.06	1	PASS
Ground	R8	Bedroom	W10-L	1.27	0.14		
			W10-U	2.21	1.09		
					1.24	1	PASS
Ground	R9	LK	W11-L	2.21	0.16		
			W11-U	3.84	1.89		
					2.05	2	PASS
Ground	R10	Bedroom	W12-L	1.27	0.16		
			W12-U	2.21	1.86		
					2.02	1	PASS
Ground	R11	LK	W13-L	2.04	0.10		
			W13-U	3.53	0.69		
			W14-L	1.15	0.10		
			W14-U	2.08	1.17		
					2.06	2	PASS
Ground	R12	Bedroom	W15-L	0.54	0.09		
			W15-U	0.97	1.07		
					1.16	1	PASS
First	R1	LK	W1-L	0.69	0.05		
			W1-U	1.25	0.40		
			W2-L	2.04	0.21		
			W2-U	3.53	2.43		
					3.09	2	PASS
First	R2	Bedroom	W3	1.73	2.00		
					2.00	1	PASS
First	R3	Bedroom	W4	2.09	2.25		
					2.25	1	PASS
First	R4	Bedroom	W5	2.12	2.67		
					2.67	1	PASS
First	R5	Bedroom	W6	1.75	2.22		
					2.22	1	PASS
First	R6	LK	W7-L	2.23	0.15		
			W7-U	3.87	1.16		
			W8-L	1.21	0.06		
			W8-U	2.11	0.73		
					2.10	2	PASS
First	R7	Bedroom	W9-L	0.72	0.09		
			W9-U	1.25	0.99		
					1.07	1	PASS
First	R8	Bedroom	W10-L	1.27	0.15		
			W10-U	2.21	1.19		
					1.34	1	PASS

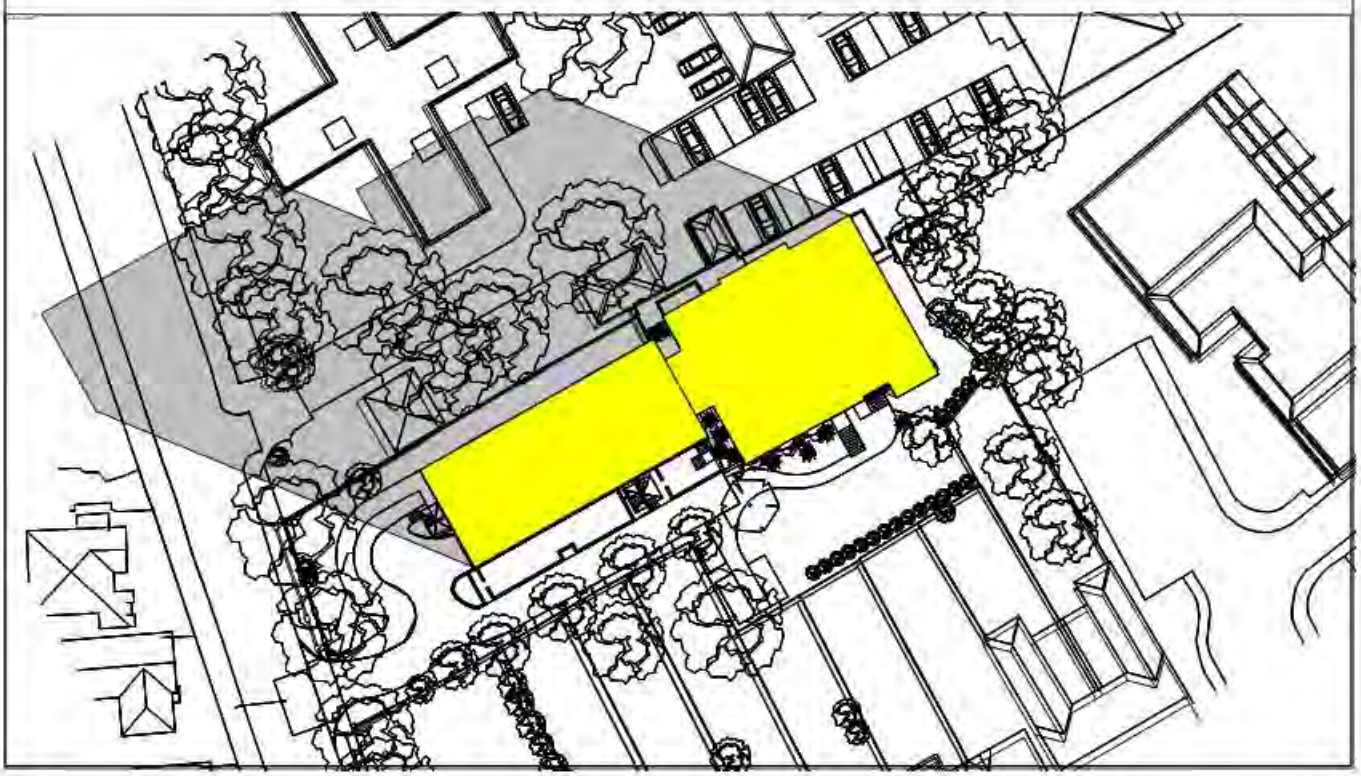
First	R9	LK	W11-L	2.21	0.17		
			W11-U	3.84	1.95		
					2.12	2	PASS
First	R10	Bedroom	W12-L	1.27	0.17		
			W12-U	2.21	2.00		
					2.17	1	PASS
First	R11	LK	W13-L	2.04	0.13		
			W13-U	3.53	1.08		
			W14-L	0.71	0.06		
			W14-U	1.29	0.78		
					2.05	2	PASS
First	R12	Bedroom	W15-L	0.54	0.09		
			W15-U	0.98	1.16		
					1.25	1	PASS
Second	R1	LK	W1-L	0.69	0.07		
			W1-U	1.25	0.84		
			W2-L	2.04	0.22		
			W2-U	3.53	2.53		
					3.66	2	PASS
Second	R2	Bedroom	W3	1.73	2.07		
					2.07	1	PASS
Second	R3	Bedroom	W4	2.09	2.33		
					2.33	1	PASS
Second	R4	Bedroom	W5	2.12	2.77		
					2.77	1	PASS
Second	R5	Bedroom	W6	1.75	2.49		
					2.49	1	PASS
Second	R6	LK	W7-L	2.23	0.20		
			W7-U	3.87	2.33		
			W8A-L	1.21	0.05		
			W8A-U	2.11	0.74		
					3.33	2	PASS
Second	R7	Bedroom	W9-L	0.72	0.09		
			W9-U	1.25	1.00		
					1.09	1	PASS
Second	R8	Bedroom	W10-L	1.27	0.15		
			W10-U	2.21	1.17		
					1.32	1	PASS
Second	R9	LK	W11-L	2.21	0.15		
			W11-U	3.84	1.16		
			W16	1.06	0.71		
					2.02	2	PASS
Second	R10	Bedroom	W12-L	1.27	0.18		
			W12-U	2.21	2.04		
					2.22	1	PASS
Second	R11	LK	W13-L	2.04	0.15		
			W13-U	3.53	1.09		
			W14-L	0.71	0.07		
			W14-U	1.29	0.83		
					2.13	2	PASS
Second	R12	Bedroom	W15-L	0.54	0.10		
			W15-U	0.98	1.23		
					1.33	1	PASS

Table 2 – Daylight (ADF) results to the Proposed Habitable Rooms at 4 & 6 Manor Road

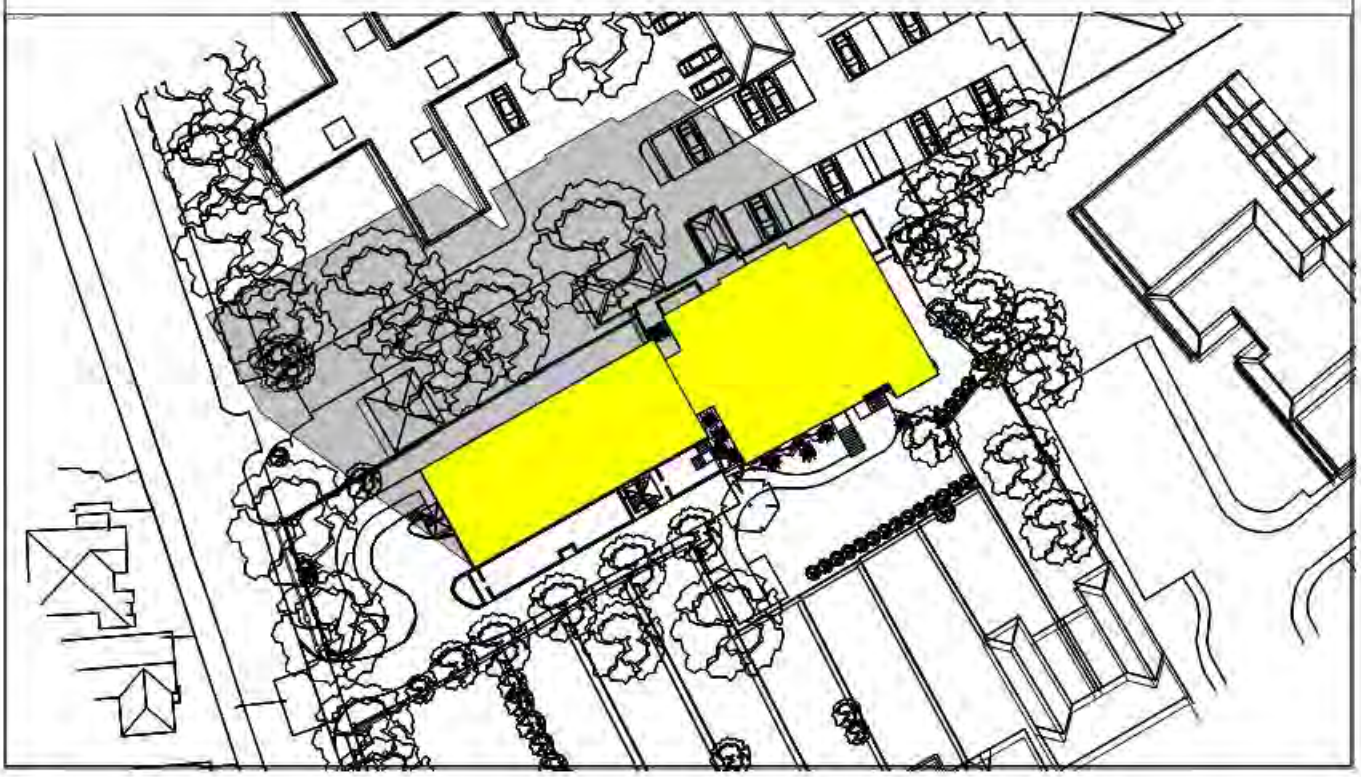
Appendix 3

Shadow Path Analysis

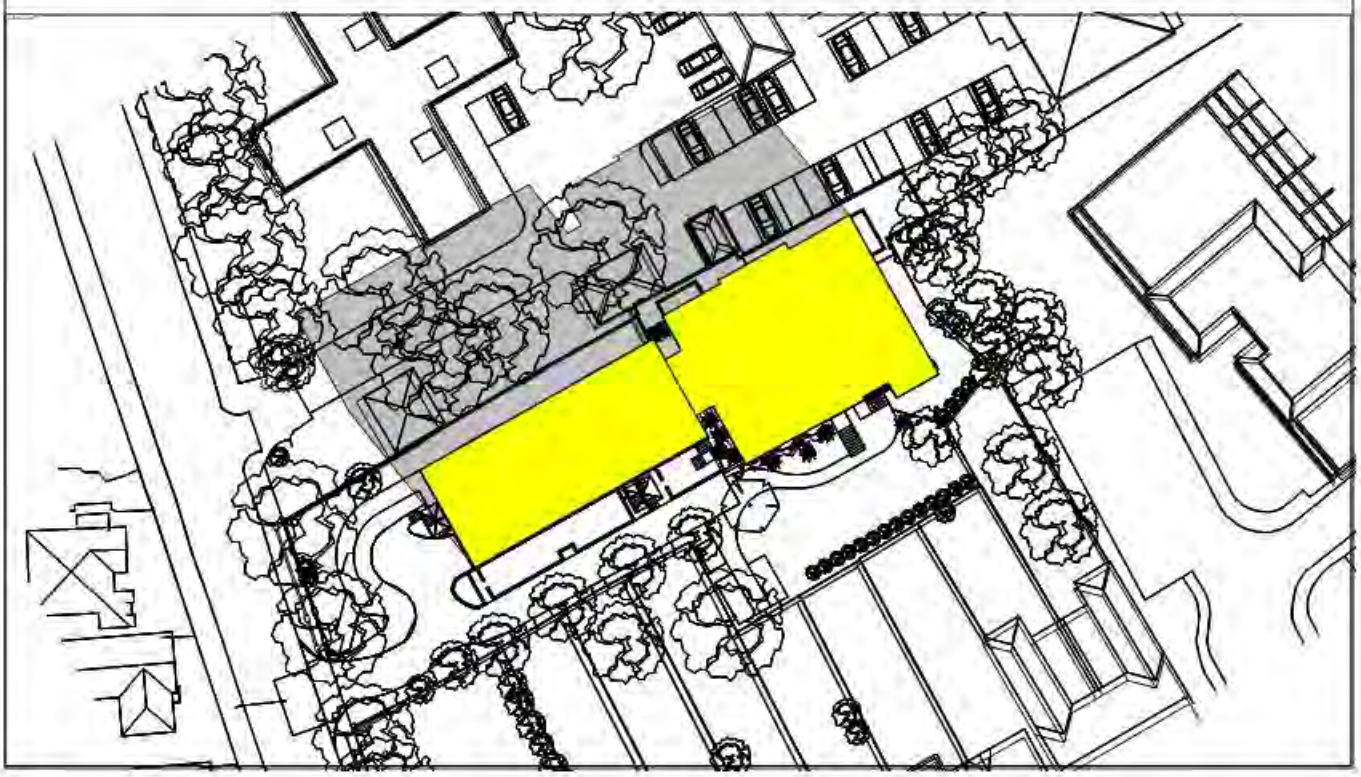
Suncast image:
View time = 21 Mar 08:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 112.48 alt = 16.43
Eye: azi = 180.00 alt = 90.00



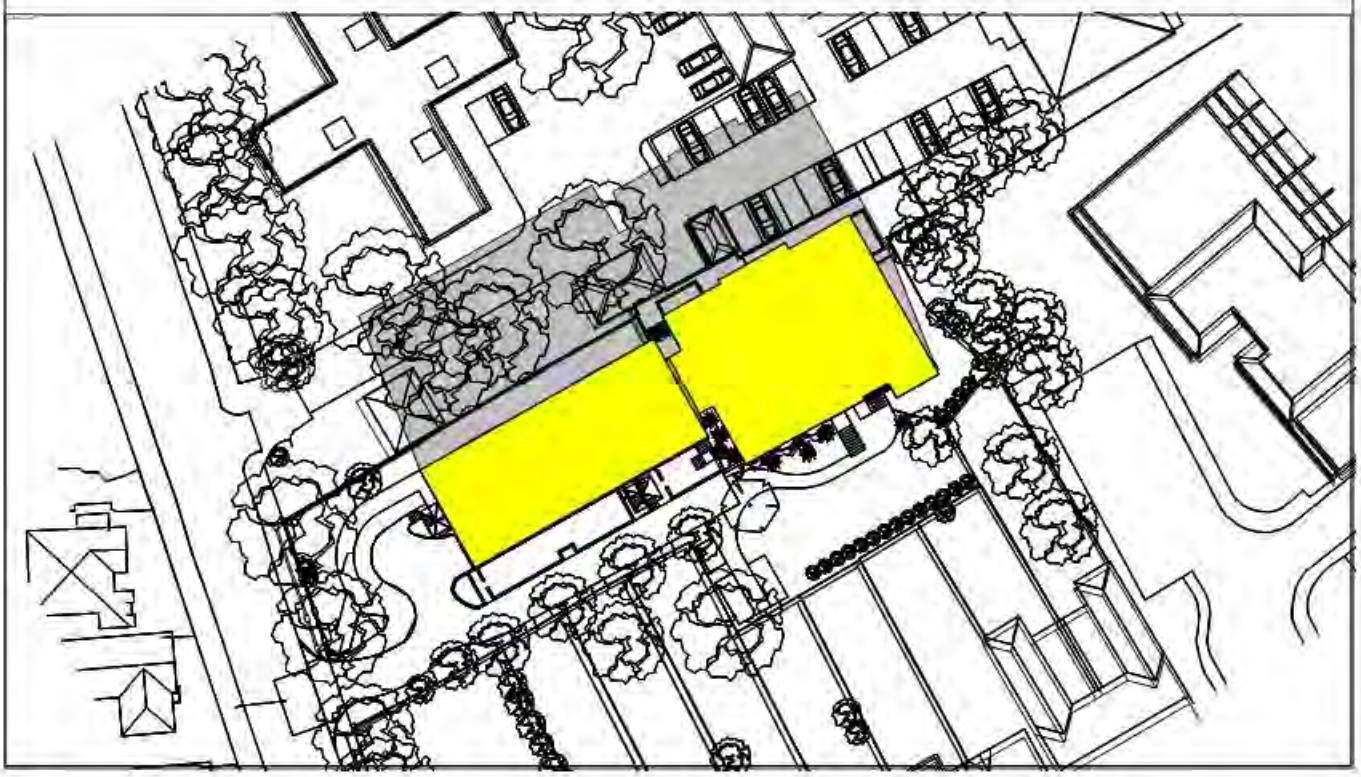
Suncast image:
View time = 21 Mar 09:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 125.95 alt = 24.58
Eye: azi = 180.00 alt = 90.00



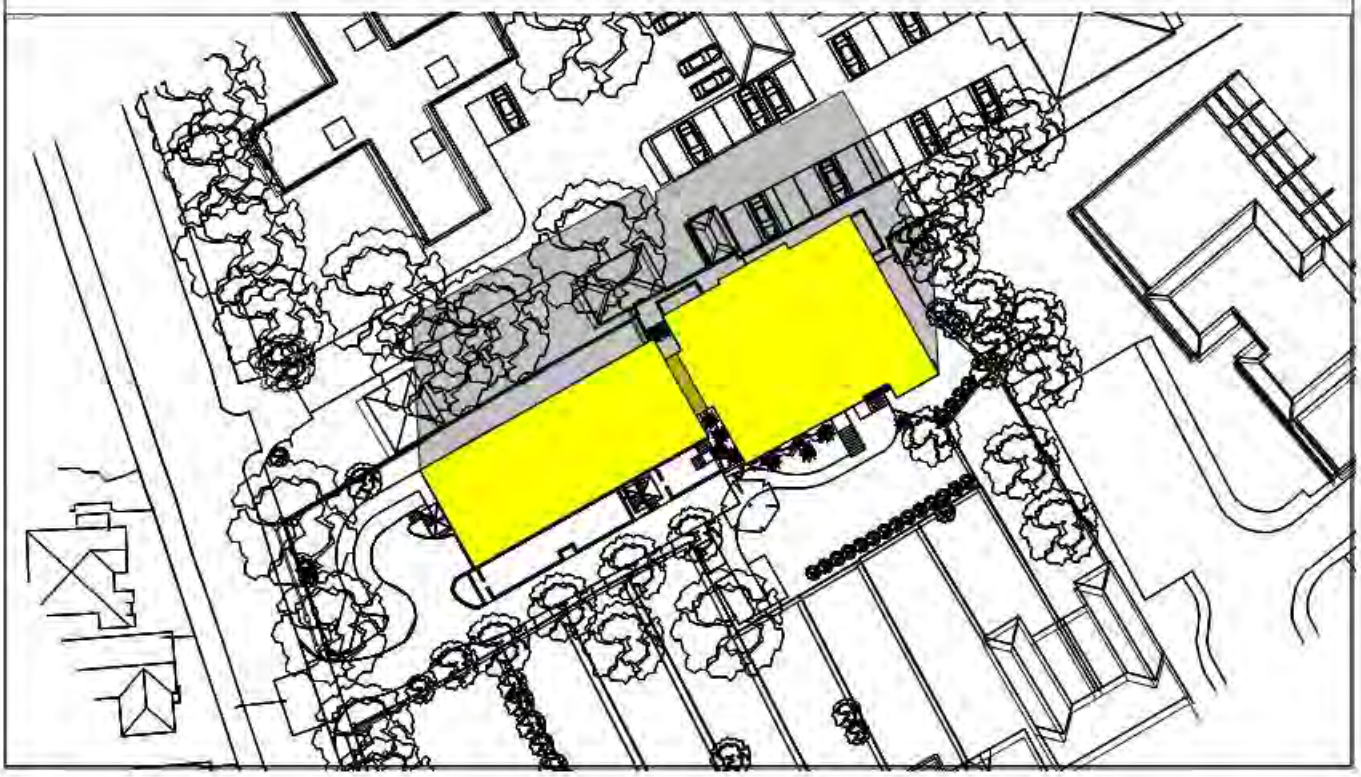
Suncast image:
View time = 21 Mar 10:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 141.13 alt = 31.35
Eye: azi = 180.00 alt = 90.00



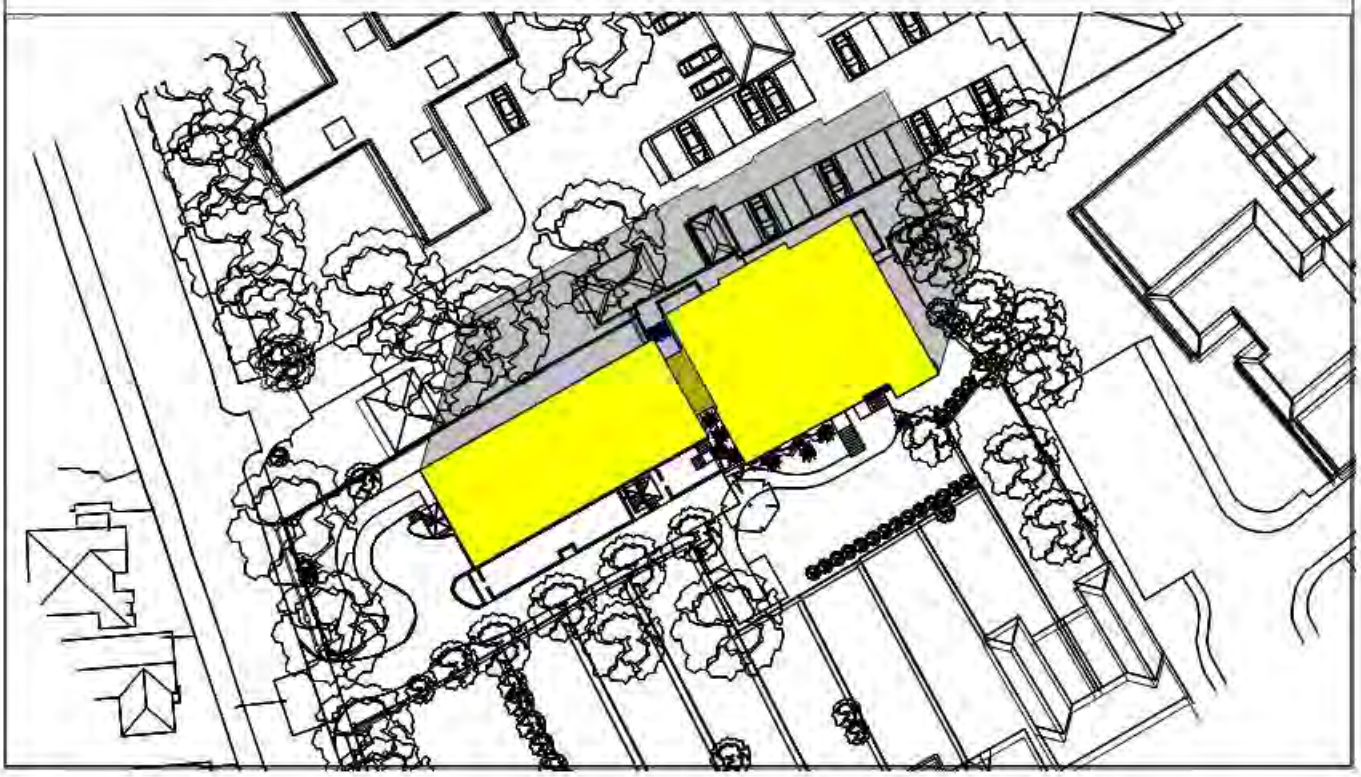
Suncast image:
View time = 21 Mar 11:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 158.28 alt = 36.06
Eye: azi = 180.00 alt = 90.00



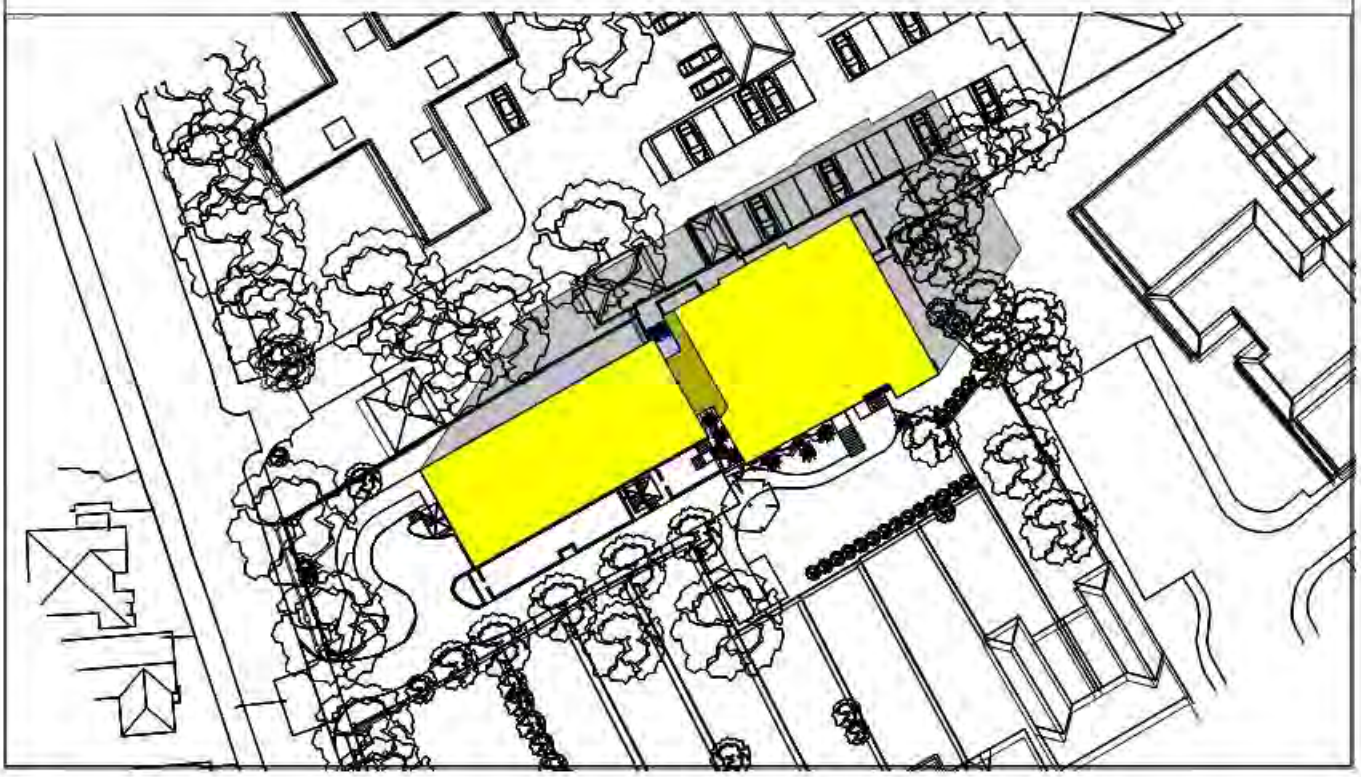
Suncast image:
View time = 21 Mar 12:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 176.94 alt = 38.07
Eye: azi = 180.00 alt = 90.00



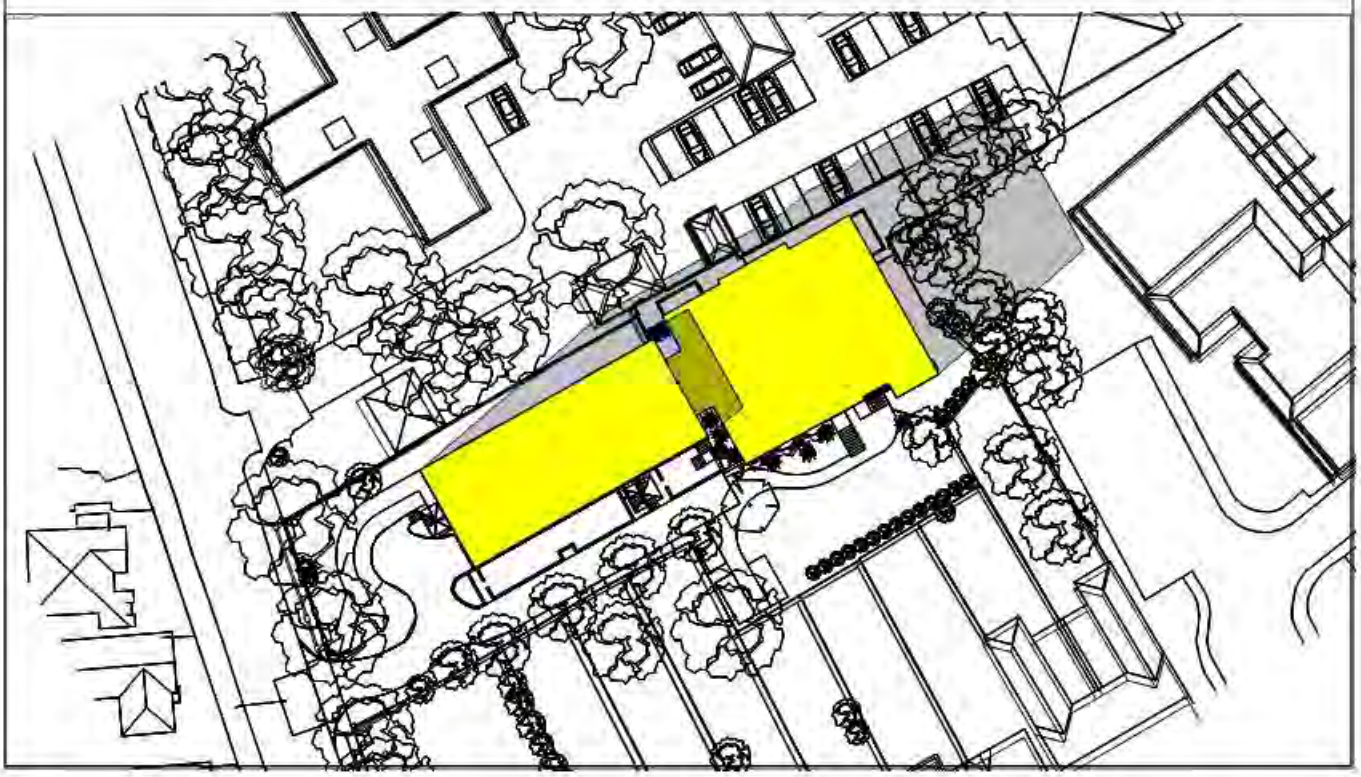
Suncast image:
View time = 21 Mar 13:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 195.84 alt = 37.03
Eye: azi = 180.00 alt = 90.00



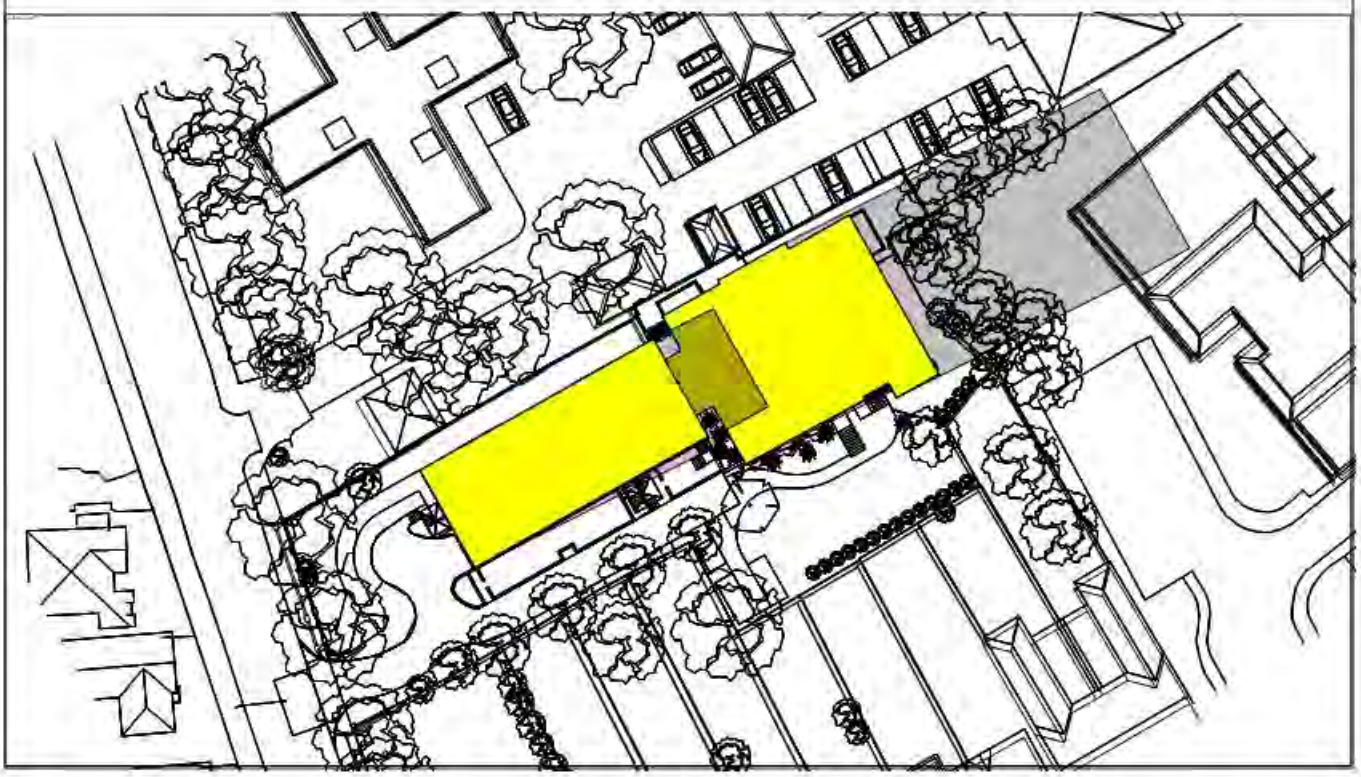
Suncast image:
View time = 21 Mar 14:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 213.57 alt = 33.12
Eye: azi = 180.00 alt = 90.00



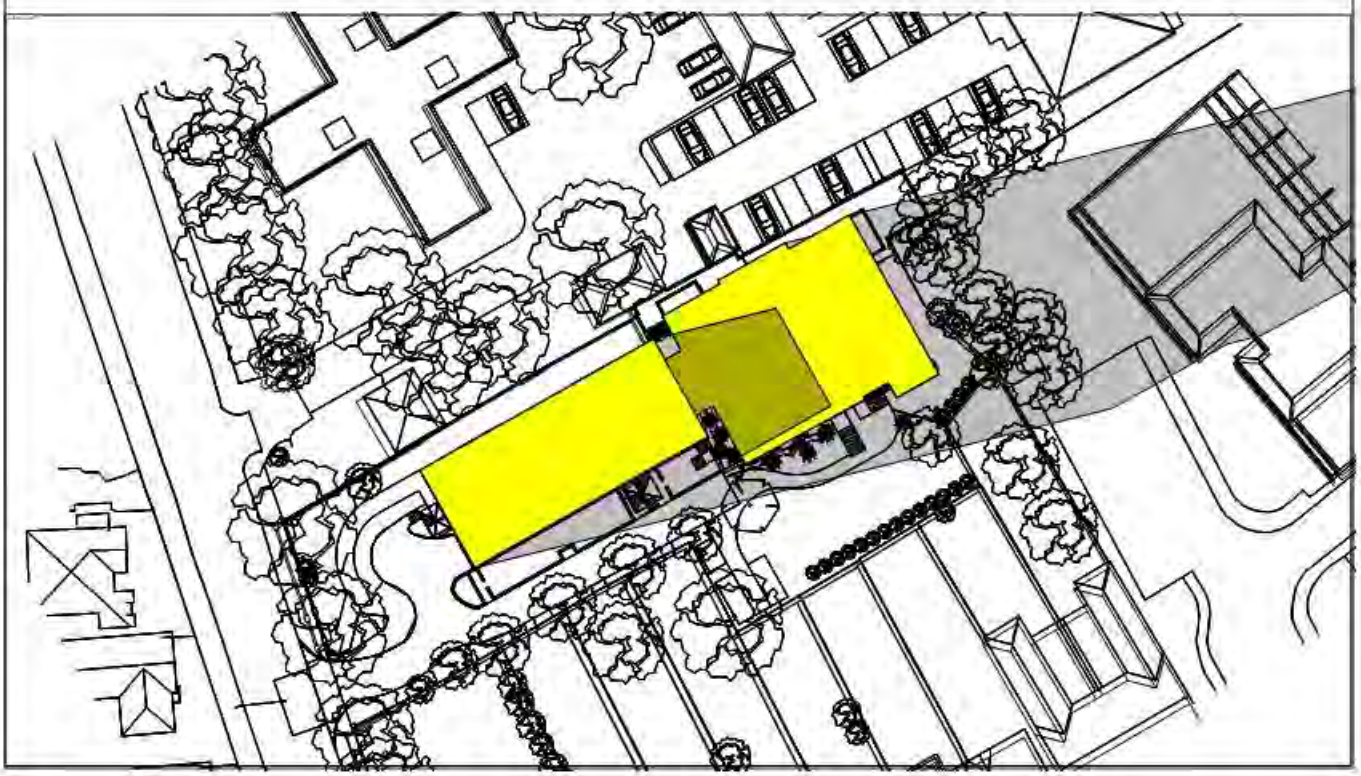
Suncast image:
View time = 21 Mar 15:00
Site Latitude = 51.48
Longitude diff. = -0.45
Model Bearing = 0.00
Sun: azi = 229.38 alt = 26.93
Eye: azi = 180.00 alt = 90.00



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 = 180.00 alt = 90.00



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 = 180.00 alt = 90.00



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 = 180.00 alt = 90.00