



Daylight, Sunlight & Shading Analysis

19 Between Towns Road,
Oxford, OX4 3LX

PR7296

Date: 18/01/2021



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EXECUTIVE SUMMARY

ERS Consultants Ltd has been instructed to carry out a detailed daylight, sunlight & shading analysis of the 19 Between Towns Road property.

The analysis is based upon the Building Research Establishment (BRE) guidelines '**Site Layout Planning for Daylight and Sunlight**', which provides the criteria and methodology for calculation in connection to daylight and sunlight.

The RADIANCE lighting simulation package, developed by the Lawrence Berkeley Laboratory in California, in conjunction with IES modelling software and interface has been used to perform the daylight simulations.

Calculations for Annual Sunlight Availability were performed using IES modelling software SUNCAST.

The results of the assessment indicate that the proposed development of the 19 Between Towns Road property has good daylight access. In fact, 97% of the total tested bedrooms achieve high Daylight values.

The majority of the bedrooms achieve good VSC and Sky View metrics. Even the rooms that may fail one of those criteria, their ADF fulfills the BRE requirement by a high margin. Therefore, the results indicate that the tested rooms will have good daylight availability.

Moreover, results of the analysis concluded that the proposed building will not exceed the allowable extent of additional shade to the enclosed yard, as shown in the results section.

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SECTION 1 INTRODUCTION

GENERAL

- ERS Consultants Ltd has been instructed to carry out a detailed daylight, sunlight & shading analysis of the 19 Between Towns Road
- The analysis was conducted for a sample of rooms, which covers the 30% of the bedrooms
- The BRE document; 'Site Layout Planning for Daylight and Sunlight' has been used as the base for this assessment.
- The examined building and the proposed extension have been modelled using Integrated Environmental Solutions Virtual Environment (IES-VE), version 2019.
- All of the windows and glazed doors in the examined samples of the 19 Between Towns Rd accommodation have been included within this assessment.
- Based on the BRE document, the following methods were used for measuring the daylight and sunlight:
 - Vertical Sky Component (VSC)
 - No Sky Line
 - Average Daylight Factor (ADF)
 - Annual probable sunlight hours (APSH)

THE SITE

The site is located in Oxford (19 Between Towns Rd, Oxford), the location in the IES model was assigned as Swindon.



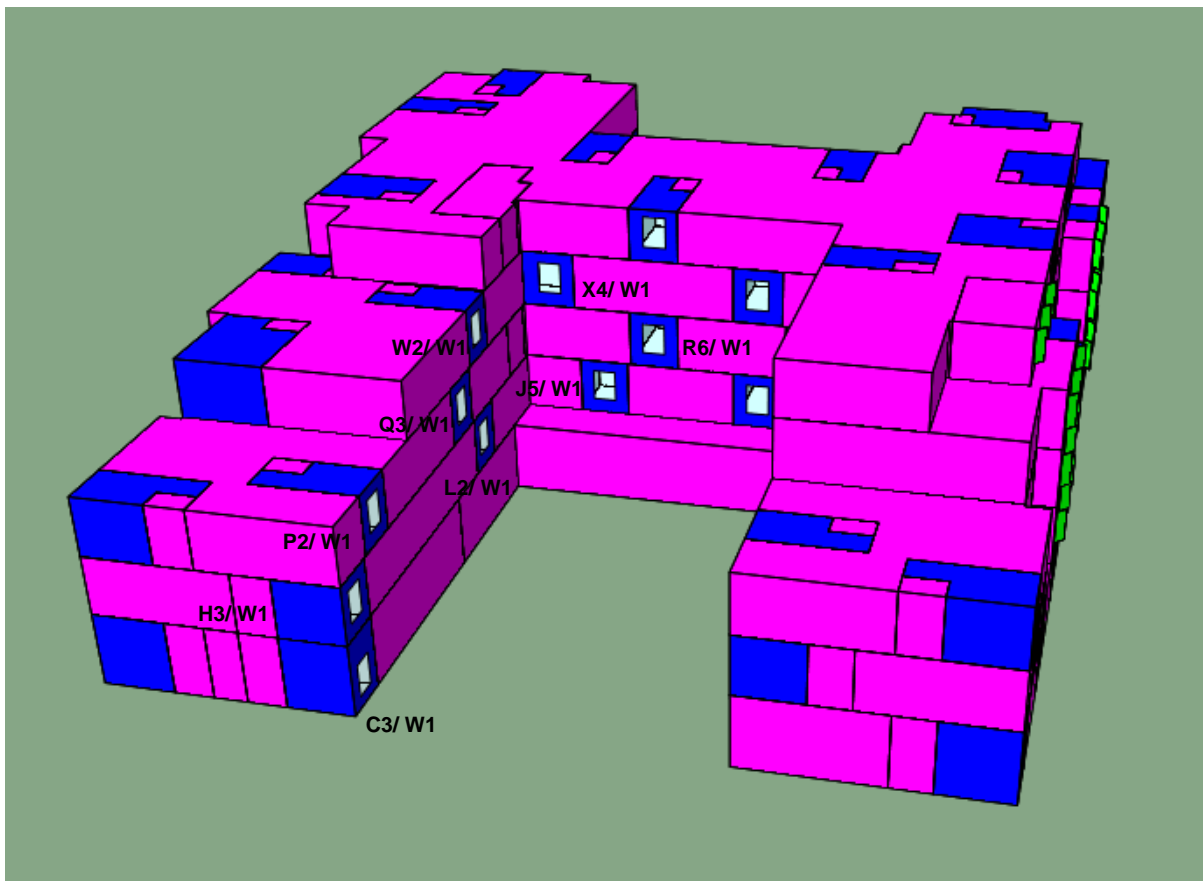
Figure 1: Site Location

DOCUMENTS CONSIDERED

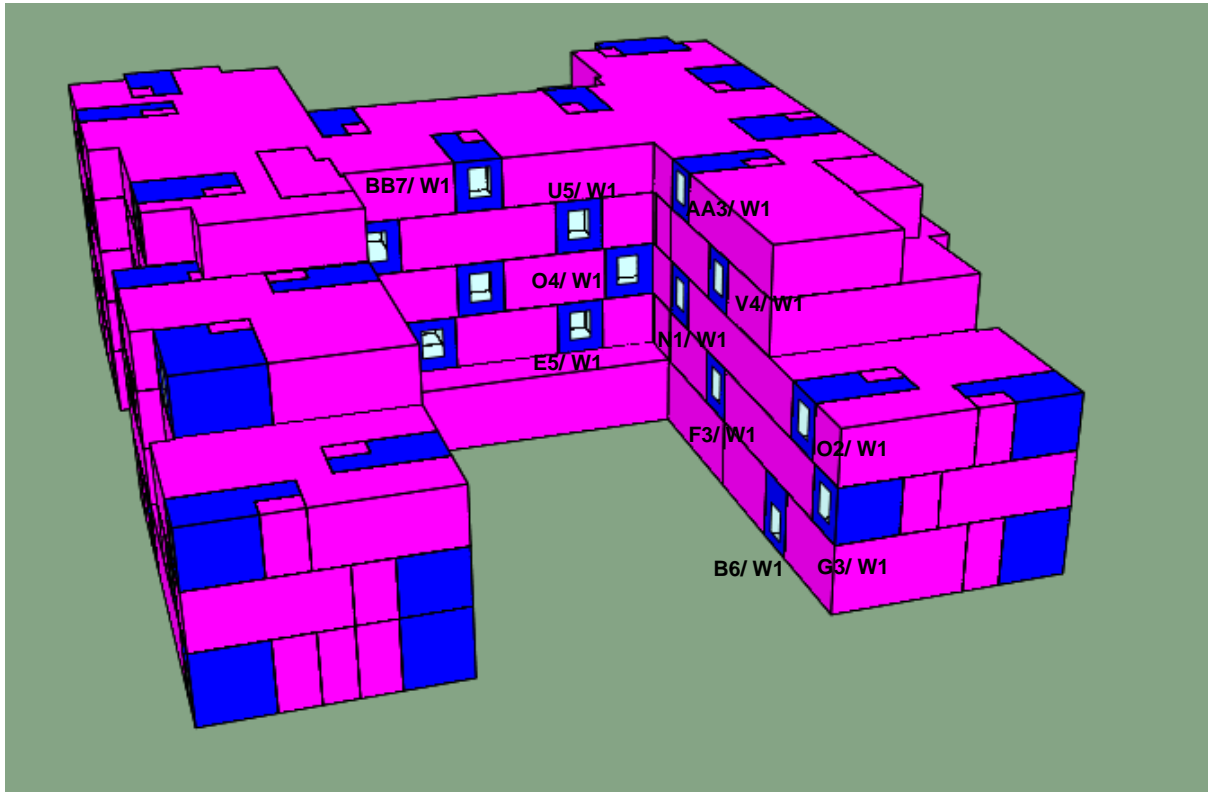
The model has been constructed based on the architectural drawing provided, the drawing references are listed in Table 1 below.

Table 1: Drawings reference

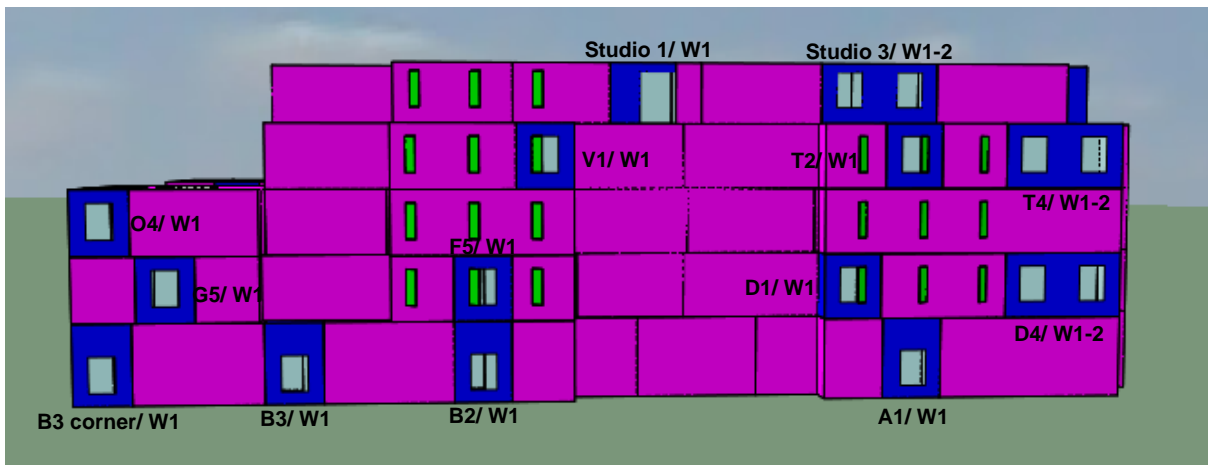
Description	Drawing Reference
Floor Plans	17, 17B & 19 Between Towns Road, Cowley - PDFs
Elevations & Sections	17, 17B & 19 Between Towns Road, Cowley - PDFs



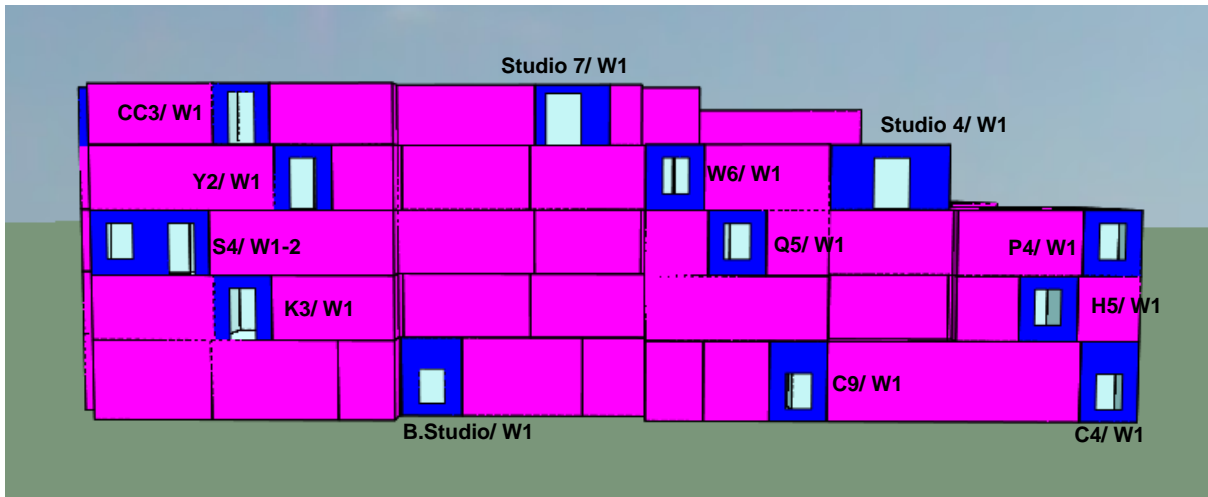
South elevation – East facing courtyard rooms



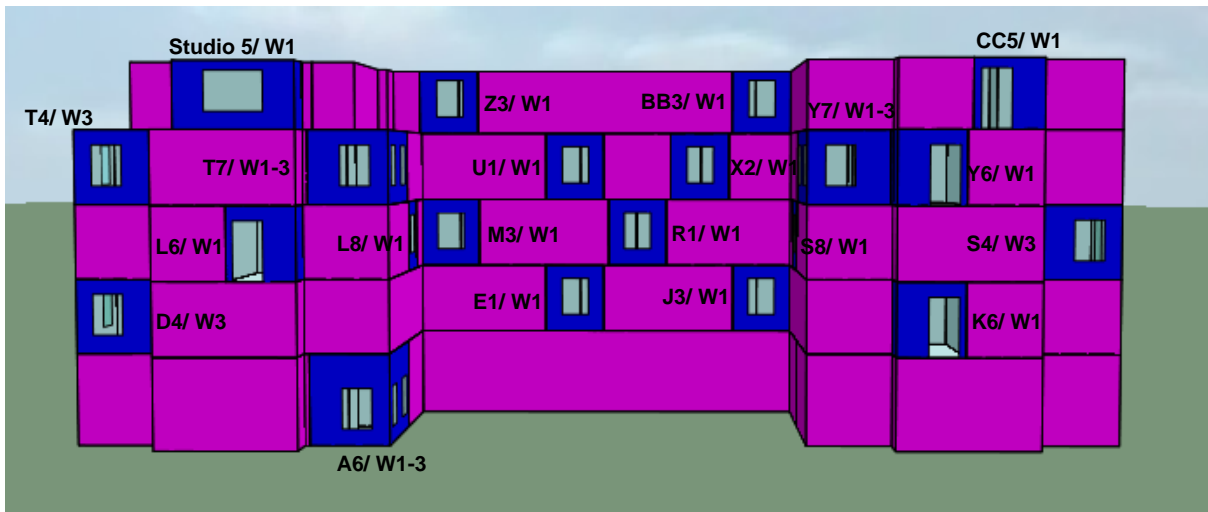
South elevation – West facing courtyard rooms



East Elevation



West Elevation



North Elevation

SECTION 2 DAYLIGHT AND SUNLIGHT TESTS & RESULTS

TESTED SAMPLES

The proposed accommodation will include 195 bedrooms and 12 studios in a 5-storey building. The samples were carefully selected to reflect the daylight conditions of the 19 Between Towns Rd building. The use of those samples can be found in Table 2 below, resulting in 65 samples in total.

Table 2 Tested room samples

19 Between Towns Road				
Floor	Bedrooms		Studios	
	Room No.	Samples	Room No.	Samples
GF	27	9	2	1
1F	52	15		
2F	52	15		
3F	40	14	3	1
4F	24	6	7	4
Sum	195	59	12	6

VERTICAL SKY COMPONENT (VSC)

The BRE document definition of the (VSC) is: Ratio of the part of illuminance, at a point on a given vertical plane, that is received directly from a CIE standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. Usually the 'given vertical plane' is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings.

The VSC is usually expressed as a percentage and the maximum value for a completely unobstructed window is slightly less than 40%. The recommendations set down in the BRE report, 'Site layout for daylight and sunlight, a guide to good practice', would indicate, for residential properties, that a VSC value of greater than 27% is acceptable.

It should be noted that the Guide itself, within the introduction, states that the advice given was not mandatory and the Guide should not be seen as an instrument of planning policy, its aim being to help rather constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly.

The RADIANCE lighting simulation package in IES-VE, has been used to perform the daylight simulations. The windows analysed are shown in Figures 2 to 7.

The results of the VSC for the windows and glazed doors are shown in Table 3. The results indicate that approximately 68% of the windows achieve a VSC above the requirements (27%).

Table 3: VSC Results

Room	Window/ Elevation	VSC (%)	Pass/ fail
GF_Bedroom Studio Room 2	W1/SW	26.11	Fail
GF_Bedroom C9	W1/SW	33.40	Pass
GF_Bedroom A6	W1/NW	33.10	Pass
	W2/SW	23.85	Fail
	W3/SW	20.82	Fail
GF_Bedroom A1	W1/NE	16.21	Fail
GF_Bedroom B2 next to common space	W1/NE	19.63	Fail
GF_Bedroom B3	W1/NE	18.57	Fail
GF_Bedroom B3 corner	W1/NE	20.58	Fail
GF_Bedroom B6	W1/SW	26.54	Fail
GF_Bedroom C3	W1/NE	29.04	Pass
GF_Bedroom C4	W1/SW	36.39	Pass
1F_Bedroom H3	W1/NE	33.01	Pass
1F_Bedroom H5	W1/SW	38.57	Pass
1F_Bedroom L2	W1/NE	22.32	Fail
1F_Bedroom G3	W1/SW	33.73	Pass
1F_Bedroom F3	W1/SW	26.28	Fail
1F_Bedroom F5	W1/NE	19.16	Fail
1F_Bedroom D1	W1/NE	16.61	Fail
1F_Bedroom D4	W1/NE	21.79	Fail
	W2/NE	23.52	Fail
	W3/NW	34.22	Pass
1F_Bedroom E1	W1/NW	28.81	Pass
1F_Bedroom J3	W1/NW	21.00	Fail
1F_Bedroom K6	W1/NW	38.55	Pass
1F_Bedroom K3	W1/SW	34.37	Pass
1F_Bedroom J5	W1/SE	23.37	Fail
1F_Bedroom E5	W1/SE	23.31	Fail
1F_Bedroom G5	W1/NE	29.55	Pass
2F_Bedroom DDA O4	W1/SE	22.33	Fail
2F_Bedroom S4	W1/SW	37.90	Pass
	W2/SW	37.55	Pass
	W3/NW	36.29	Pass
2F_Bedroom S8	W1/NE	23.87	Fail

2F_Bedroom Q5	W1/SW	39.05	Pass
2F_Bedroom P4	W1/SW	39.59	Pass
2F_Bedroom P2	W1/NE	34.82	Pass
2F_Bedroom Q3	W1/NE	29.21	Pass
2F_Bedroom R6	W1/SE	29.90	Pass
2F_Bedroom N1	W1/SW	25.06	Fail
2F_Bedroom O2	W1/SW	35.84	Pass
2F_Bedroom O4	W1/NE	37.22	Pass
2F_Bedroom L8	W1/SW	23.23	Fail
2F_Bedroom L6	W1/NW	38.74	Pass
2F_Bedroom M3	W1/NW	23.78	Fail
2F_Bedroom R1	W1/NW	31.64	Pass
3F_Bedroom DDA X4	W1/SE	25.61	Fail
3F_Bedroom Y7	W1/NE	33.00	Pass
	W2/NE	34.79	Pass
	W3/NW	36.50	Pass
3F_Bedroom Y6	W1/NW	39.56	Pass
3F_Bedroom Y2	W1/SW	39.57	Pass
3F_Bedroom W6	W1/SW	39.73	Pass
3F_Studio Room 4	W1/SW	39.20	Pass
3F_Bedroom W2	W1/NE	32.42	Pass
3F_Bedroom U5	W1/SE	31.50	Pass
3F_Bedroom X2	W1/NW	31.85	Pass
3F_Bedroom U1	W1/NW	35.67	Pass
3F_Bedroom T7	W1/NW	37.70	Pass
	W2/SW	34.43	Pass
	W3/SW	32.23	Pass
3F_Bedroom T4	W1/NE	33.69	Pass
	W2/NE	34.28	Pass
	W3/NW	37.55	Pass
3F_Bedroom T2	W1/NE	23.55	Fail
3F_Bedroom V1	W1/NE	25.83	Fail
3F_Bedroom V4	W1/SW	35.22	Pass
4F_Studio Room 7	W1/SW	39.62	Pass
4F_Bedroom CC3	W1/SW	39.59	Pass
4F_Bedroom CC5	W1/NW	39.92	Pass
4F_Bedroom BB3	W1/NW	32.02	Pass

4F_Bedroom Z3	W1/NW	36.24	Pass
4F_Studio Room 5	W1/NW	39.48	Pass
4F_Studio Room 3	W1/NE W2/NE	38.89 38.85	Pass Pass
4F_Studio Room 1	W1/NE	39.01	Pass
4F_Bedroom AA3	W1/SW	37.03	Pass
4F_Bedroom BB7	W1/SE	38.37	Pass

AVERAGE DAYLIGHT FACTOR (ADF)

The BRE document defines ADF as: The ratio of total 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.

In housing BS 8206-2 gives minimum values of ADF of 2% for kitchens, 1.5% for living rooms and 1% for bedrooms.

The results of the ADF for the tested rooms are shown in Table 4 below indicating that the ADF did not suffer from any noticeable reduction in the tested rooms.

The majority of ADF figures in all the tested rooms (97%) are above the recommended ADF stated in the BS 8206-2 document, showing that, within the analysed rooms, the ADF values meet the BRE guidelines, guaranteeing sufficient visual comfort.

Table 4: ADF Results

Room	Window/orientation	ADF (%)	Recommended ADF	Pass/fail
GF_Bedroom Studio Room 2	W1/SW	2.60	1.00	Pass
GF_Bedroom C9	W1/SW	2.50	1.00	Pass
GF_Bedroom A6	W1/NW W2-3/SW	5.40	1.00	Pass
GF_Bedroom A1	W1/NE	0.60	1.00	Fail
GF_Bedroom B2 next to common space	W1/NE	1.30	1.00	Pass
GF_Bedroom B3	W1/NE	1.20	1.00	Pass
GF_Bedroom B3 corner	W1/NE	1.40	1.00	Pass
GF_Bedroom B6	W1/SW	1.90	1.00	Pass
GF_Bedroom C3	W1/NE	1.80	1.00	Pass
GF_Bedroom C4	W1/SW	2.80	1.00	Pass
1F_Bedroom H3	W1/NE	2.60	1.00	Pass

1F_Bedroom H5	W1/SW	3.40	1.00	Pass
1F_Bedroom L2	W1/NE	1.60	1.00	Pass
1F_Bedroom G3	W1/SW	3.20	1.00	Pass
1F_Bedroom F3	W1/SW	2.5	1.00	Pass
1F_Bedroom F5	W1/NE	1.90	1.00	Pass
1F_Bedroom D1	W1/NE	1.60	1.00	Pass
1F_Bedroom D4	W1-2/NE W3/NW	4.80	1.00	Pass
1F_Bedroom E1	W1/NW	4.20	1.00	Pass
1F_Bedroom J3	W1/NW	2.00	1.00	Pass
1F_Bedroom K6	W1/NW	2.90	1.00	Pass
1F_Bedroom K3	W1/SW	3.10	1.00	Pass
1F_Bedroom J5	W1/SE	2.90	1.00	Pass
1F_Bedroom E5	W1/SE	2.60	1.00	Pass
1F_Bedroom G5	W1/NE	2.90	1.00	Pass
2F_Bedroom DDA O4	W1/SE	2.70	1.00	Pass
2F_Bedroom S4	W1-2/SW W3/NW	7.40	1.00	Pass
2F_Bedroom S8	W1/NE	2.40	1.00	Pass
2F_Bedroom Q5	W1/SW	3.20	1.00	Pass
2F_Bedroom P4	W1/SW	3.30	1.00	Pass
2F_Bedroom P2	W1/NE	4.10	1.00	Pass
2F_Bedroom Q3	W1/NE	2.00	1.00	Pass
2F_Bedroom R6	W1/SE	3.20	1.00	Pass
2F_Bedroom N1	W1/SW	2.40	1.00	Pass
2F_Bedroom O2	W1/SW	3.10	1.00	Pass
2F_Bedroom O4	W1/NE	3.30	1.00	Pass
2F_Bedroom L8	W1/SW	2.20	1.00	Pass
2F_Bedroom L6	W1/NW	2.50	1.00	Pass
2F_Bedroom M3	W1/NW	3.10	1.00	Pass
2F_Bedroom R1	W1/NW	2.60	1.00	Pass
3F_Bedroom DDA X4	W1/SE	2.40	1.00	Pass
3F_Bedroom Y7	W1-2/NE W3/NW	8.00	1.00	Pass
3F_Bedroom Y6	W1/NW	2.70	1.00	Pass
3F_Bedroom Y2	W1/SW	3.30	1.00	Pass
3F_Bedroom W6	W1/SW	3.20	1.00	Pass

3F_Studio Room 4	W1/SW	2.70	2.00	Pass
3F_Bedroom W2	W1/NE	2.30	1.00	Pass
3F_Bedroom U5	W1/SE	2.90	1.00	Pass
3F_Bedroom X2	W1/NW	2.60	1.00	Pass
3F_Bedroom U1	W1/NW	2.60	1.00	Pass
3F_Bedroom T7	W1/NW	7.00	1.00	Pass
3F_Bedroom T4	W2-3/SW W1-2/NE W3/NW	6.40	1.00	Pass
3F_Bedroom T2	W1/NE	1.80	1.00	Pass
3F_Bedroom V1	W1/NE	2.20	1.00	Pass
3F_Bedroom V4	W1/SW	3.00	1.00	Pass
4F_Studio Room 7	W1/SW	3.30	2.00	Pass
4F_Bedroom CC3	W1/SW	3.30	1.00	Pass
4F_Bedroom CC5	W1/NW	2.90	1.00	Pass
4F_Bedroom BB3	W1/NW	2.50	1.00	Pass
4F_Bedroom Z3	W1/NW	2.70	1.00	Pass
4F_Studio Room 5	W1/NW	4.90	2.00	Pass
4F_Studio Room 3	W1-2/NE	3.30	2.00	Pass
4F_Studio Room 1	W1/NE	1.80	2.00	Fail
4F_Bedroom AA3	W1/SW	3.10	1.00	Pass
4F_Bedroom BB7	W1/SE	3.10	1.00	Pass

ANNUAL PROBABLE SUNLIGHT HOURS (APSH)

APSH is the total number of hours in the year that the sun is expected to shine on the centre of each window, allowing for average levels of cloudiness for the location in question. This test is usually used to test façade within 90 degrees of due south.

The BRE Handbook notes that:

“...a south facing window will, in general, receive most sunlight, while a north facing one will receive it only on a handful of occasions. East and west facing windows will receive sunlight only at certain times of day”.

For existing residential buildings, the BRE Handbook suggests that: *“all main living rooms of dwellings... should be checked if they have a window facing within 90° of due south. Kitchens and bedrooms are less important, although care should be taken not to block too much sun”.*

The BRE guide explains that sunlight availability may be adversely affected if the centre of the window:

- Receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between 21st of September and 21st March and;
- Receives less than 0.8 times its former sunlight hours during either period and;
- Has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

The results of the APSH (Table 5) are showing that 51% of the tested windows have an average of APSH above requirements.

All of the failing windows are facing within 90 degrees of due north, a situation which provides limited access to sunlight. The BS 8206-2 criterion applies to rooms of all orientations, although if a room faces significantly north of due east or west it is unlikely to be met.

Table 5: APSH Results

Room	Opening/ Orientation	Average Probable Sunlight Hours			Pass/Fail
		Summer	Winter	Average	
GF_Bedroom Studio Room 2	W1/SW	25.34	44.72	19.37	Pass
GF_Bedroom C9	W1/SW	29.89	50.18	20.29	Pass
GF_Bedroom A6	W1/NW	17.06	21.17	4.11	Fail
	W2/SW	26.05	28.91	2.87	Pass
	W3/SW	21.20	23.26	2.05	Fail
GF_Bedroom A1	W1/NE	11.85	15.30	3.45	Fail
GF_Bedroom B2 next to common space	W1/NE	11.13	15.63	4.50	Fail
GF_Bedroom B3	W1/NE	9.00	14.38	5.38	Fail
GF_Bedroom B3 corner	W1/NE	12.37	20.33	7.96	Fail
GF_Bedroom B6	W1/SW	22.75	41.76	19.02	Pass
GF_Bedroom C3	W1/NE	21.26	27.13	5.87	Pass
GF_Bedroom C4	W1/SW	30.39	55.59	25.20	Pass
1F_Bedroom H3	W1/NE	22.51	31.99	9.48	Pass
1F_Bedroom H5	W1/SW	33.49	59.80	26.31	Pass
1F_Bedroom L2	W1/NE	15.76	24.66	8.90	Fail
1F_Bedroom G3	W1/SW	27.28	51.59	24.31	Pass
1F_Bedroom F3	W1/SW	23.28	41.97	18.69	Pass
1F_Bedroom F5	W1/NE	4.06	4.66	0.61	Fail
1F_Bedroom D1	W1/NE	15.19	21.04	5.85	Fail
1F_Bedroom D4	W1/NE	11.32	15.47	4.15	Fail
	W2/NE	11.47	17.25	5.78	Fail
	W3/NW	7.21	7.31	0.11	Fail
1F_Bedroom E1	W1/NW	6.28	6.28	0.00	Fail
1F_Bedroom J3	W1/NW	0.00	0.00	0.00	Fail
1F_Bedroom K6	W1/NW	18.75	22.86	4.11	Fail
1F_Bedroom K3	W1/SW	35.46	56.37	20.91	Pass

1F_Bedroom J5	W1/SE	18.98	30.68	11.70	Pass
1F_Bedroom E5	W1/SE	19.92	36.79	16.88	Pass
1F_Bedroom G5	W1/NE	14.78	22.30	7.52	Fail
2F_Bedroom DDA O4	W1/SE	19.49	39.17	19.68	Pass
2F_Bedroom S4	W1/SW	36.99	62.08	25.09	Pass
	W2/SW	36.99	60.63	23.64	Pass
	W3/NW	19.86	23.90	4.04	Fail
2F_Bedroom S8	W1/NE	0.00	0.00	0.00	Fail
2F_Bedroom Q5	W1/SW	35.46	64.22	28.77	Pass
2F_Bedroom P4	W1/SW	34.77	64.22	29.45	Pass
2F_Bedroom P2	W1/NE	22.34	31.93	9.59	Pass
2F_Bedroom Q3	W1/NE	18.16	27.75	9.59	Pass
2F_Bedroom R6	W1/SE	26.25	44.07	17.82	Pass
2F_Bedroom N1	W1/SW	23.74	43.96	20.22	Pass
2F_Bedroom O2	W1/SW	29.68	55.04	25.36	Pass
2F_Bedroom O4	W1/NE	21.06	30.65	9.59	Pass
2F_Bedroom L8	W1/SW	26.68	28.05	1.37	Pass
2F_Bedroom L6	W1/NW	19.56	23.67	4.11	Fail
2F_Bedroom M3	W1/NW	17.41	17.41	0.00	Fail
2F_Bedroom R1	W1/NW	4.09	4.09	0.00	Fail
3F_Bedroom DDA X4	W1/SE	23.27	35.95	12.68	Pass
3F_Bedroom Y7	W1/NE	12.95	12.97	0.02	Fail
	W2/NE	16.73	17.49	0.76	Fail
	W3/NW	9.09	9.22	0.12	Fail
3F_Bedroom Y6	W1/NW	19.97	24.54	4.57	Fail
3F_Bedroom Y2	W1/SW	36.92	65.05	28.13	Pass
3F_Bedroom W6	W1/SW	36.99	66.31	29.32	Pass
3F_Studio Room 4	W1/SW	36.32	65.53	29.21	Pass
3F_Bedroom W2	W1/NE	18.94	28.53	9.59	Pass
3F_Bedroom U5	W1/SE	26.20	51.12	24.92	Pass
3F_Bedroom X2	W1/NW	2.19	2.19	0.00	Fail
3F_Bedroom U1	W1/NW	15.30	15.30	0.00	Fail
3F_Bedroom T7	W1/NW	19.86	23.97	4.11	Fail
	W2/SW	36.99	52.27	15.28	Pass
	W3/SW	36.95	46.85	9.89	Pass
3F_Bedroom T4	W1/NE	17.12	24.26	7.14	Fail
	W2/NE	16.80	25.39	8.59	Pass
	W3/NW	14.11	14.26	0.15	Fail
3F_Bedroom T2	W1/NE	17.12	24.77	7.64	Fail
3F_Bedroom V1	W1/NE	9.27	10.29	1.02	Fail
3F_Bedroom V4	W1/SW	29.54	54.73	25.19	Pass
4F_Studio Room 7	W1/SW	36.99	66.44	29.45	Pass
4F_Bedroom CC3	W1/SW	36.99	66.44	29.45	Pass
4F_Bedroom CC5	W1/NW	20.55	25.34	4.79	Pass
4F_Bedroom BB3	W1/NW	3.80	3.83	0.03	Fail
4F_Bedroom Z3	W1/NW	19.86	2.09	21.96	Fail
4F_Studio Room 5	W1/NW	20.10	24.26	4.16	Fail

	W1/NE	23.01	32.60	9.59	Pass
4F_Studio Room 3	W2/NE	23.01	32.60	9.59	Pass
4F_Studio Room 1	W1/NE	23.97	33.41	9.44	Pass
4F_Bedroom AA3	W1/SW	31.76	58.22	26.46	Pass
4F_Bedroom BB7	W1/SE	37.45	68.28	30.82	Pass

NO SKY LINE

The No sky line is the outline on the working plane of the area from which no sky can be seen. This is to determine the light distribution in a room. The IES-VE calculation method is to define the sky view factor, which is the factor from the surface to the sky, this is *the ratio of the diffuse sky radiation received by the surface to that which would be received by the same surface if it were completely exposed to the sky* (The theory assumes that the diffuse sky radiation is isotropic).

The percentage area of no sky view is shown for each room in Table 6 below. The results indicate that the majority of the rooms (89%) have high sky view percentage.

Table 6: Sky View Area Results

Reference	Room	Window/orientation	Sky view area (working plane)	Pass/Fail
	GF_Bedroom Studio Room 2	W1/SW	100	Pass
	GF_Bedroom C9	W1/SW	95	Pass
	GF_Bedroom A6	W1/NW W2-3/SW	100	Pass
	GF_Bedroom A1	W1/NE	26	Fail
	GF_Bedroom B2 next to common space	W1/NE	89	Pass
	GF_Bedroom B3	W1/NE	47	Fail
	GF_Bedroom B3 corner	W1/NE	47	Fail
	GF_Bedroom B6	W1/SW	79	Fail
	GF_Bedroom C3	W1/NE	100	Pass
	GF_Bedroom C4	W1/SW	100	Pass
	1F_Bedroom H3	W1/NE	100	Pass
	1F_Bedroom H5	W1/SW	100	Pass
	1F_Bedroom L2	W1/NE	75	Fail
	1F_Bedroom G3	W1/SW	100	Pass
	1F_Bedroom F3	W1/SW	84	Pass
	1F_Bedroom F5	W1/NE	100	Pass
	1F_Bedroom D1	W1/NE	58	Fail
	1F_Bedroom D4	W1-2/NE W3/NW	96	Pass

1F_Bedroom E1	W1/NW	100	Pass
1F_Bedroom J3	W1/NW	100	Pass
1F_Bedroom K6	W1/NW	100	Pass
1F_Bedroom K3	W1/SW	95	Pass
1F_Bedroom J5	W1/SE	100	Pass
1F_Bedroom E5	W1/SE	100	Pass
1F_Bedroom G5	W1/NE	100	Pass
2F_Bedroom DDA O4	W1/SE	100	Pass
2F_Bedroom S4	W1-2/SW W3/NW	100	Pass
2F_Bedroom S8	W1/NE	95	Pass
2F_Bedroom Q5	W1/SW	100	Pass
2F_Bedroom P4	W1/SW	100	Pass
2F_Bedroom P2	W1/NE	100	Pass
2F_Bedroom Q3	W1/NE	88	Pass
2F_Bedroom R6	W1/SE	100	Pass
2F_Bedroom N1	W1/SW	100	Pass
2F_Bedroom O2	W1/SW	100	Pass
2F_Bedroom O4	W1/NE	100	Pass
2F_Bedroom L8	W1/SW	84	Pass
2F_Bedroom L6	W1/NW	100	Pass
2F_Bedroom M3	W1/NW	100	Pass
2F_Bedroom R1	W1/NW	100	Pass
3F_Bedroom DDA X4	W1/SE	100	Pass
3F_Bedroom Y7	W1-2/NE W3/NW	100	Pass
3F_Bedroom Y6	W1/NW	100	Pass
3F_Bedroom Y2	W1/SW	100	Pass
3F_Bedroom W6	W1/SW	100	Pass
3F_Studio Room 4	W1/SW	100	Pass
3F_Bedroom W2	W1/NE	100	Pass
3F_Bedroom U5	W1/SE	100	Pass
3F_Bedroom X2	W1/NW	100	Pass
3F_Bedroom U1	W1/NW	100	Pass
3F_Bedroom T7	W1/NW W2-3/SW	100	Pass
3F_Bedroom T4	W1-2/NE W3/NW	100	Pass

3F_Bedroom T2	W1/NE	100	Pass
3F_Bedroom V1	W1/NE	100	Pass
3F_Bedroom V4	W1/SW	100	Pass
4F_Studio Room 7	W1/SW	100	Pass
4F_Bedroom CC3	W1/SW	100	Pass
4F_Bedroom CC5	W1/NW	100	Pass
4F_Bedroom BB3	W1/NW	100	Pass
4F_Bedroom Z3	W1/NW	100	Pass
4F_Studio Room 5	W1/NW	100	Pass
4F_Studio Room 3	W1-2/NE	100	Pass
4F_Studio Room 1	W1/NE	98	Pass
4F_Bedroom AA3	W1/SW	100	Pass
4F_Bedroom BB7	W1/SE	100	Pass

SHADING ANALYSIS

The BRE document Site Layout Planning for Daylight and Sunlight: A guide to good practice has been referred to. The document indicates that the sunlight in the spaces between buildings has an important impact on the overall appearance and ambience of a development.

The document recommends that at least half of the amenity areas such as back gardens should receive at least two hours of sunlight on 21 March.

The South and North facing courtyards of the 19 Between Towns Rd property were analysed separately based on the BRE recommendations.

SHADING ANALYSIS RESULTS

The summer solstice and winter equinox were investigated. The results indicated that the shading of the courtyard due to the proposed development of the 19 Between Towns Road will be reasonable. The analysis indicates that the South facing yard will not suffer from increased shading as the whole area receives more than 2 hours of sunlight on the 21st of March (Figure 14). In the North facing courtyard only the 18% of the total area will receive the required daylight, however, this is expected due to its orientation.

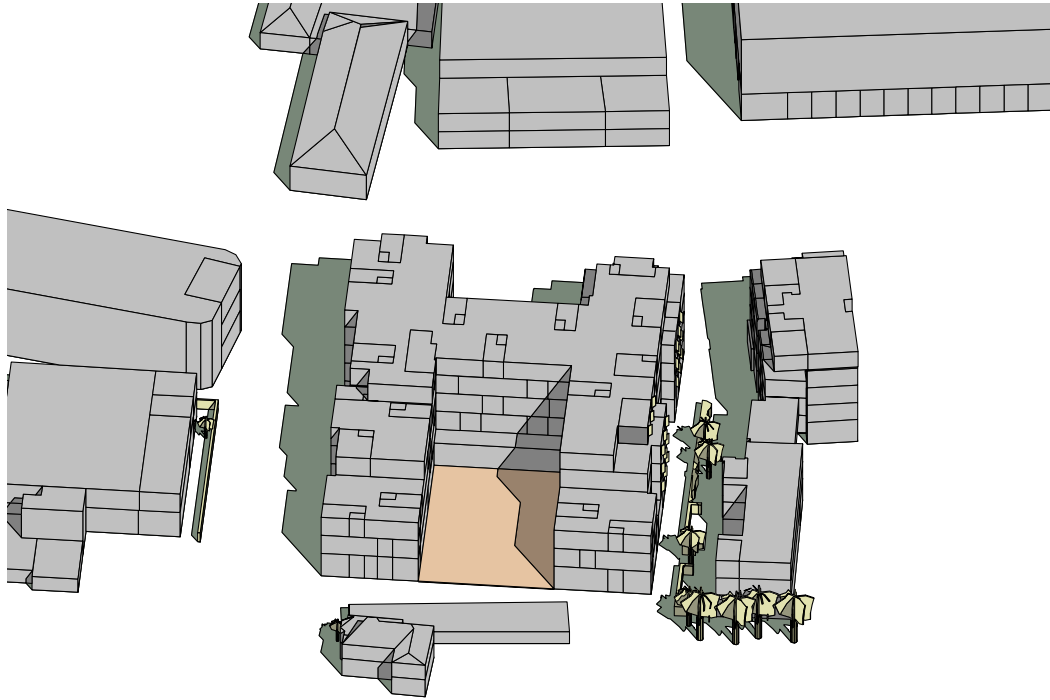


Figure 8 Summer Solstice at 9:00am

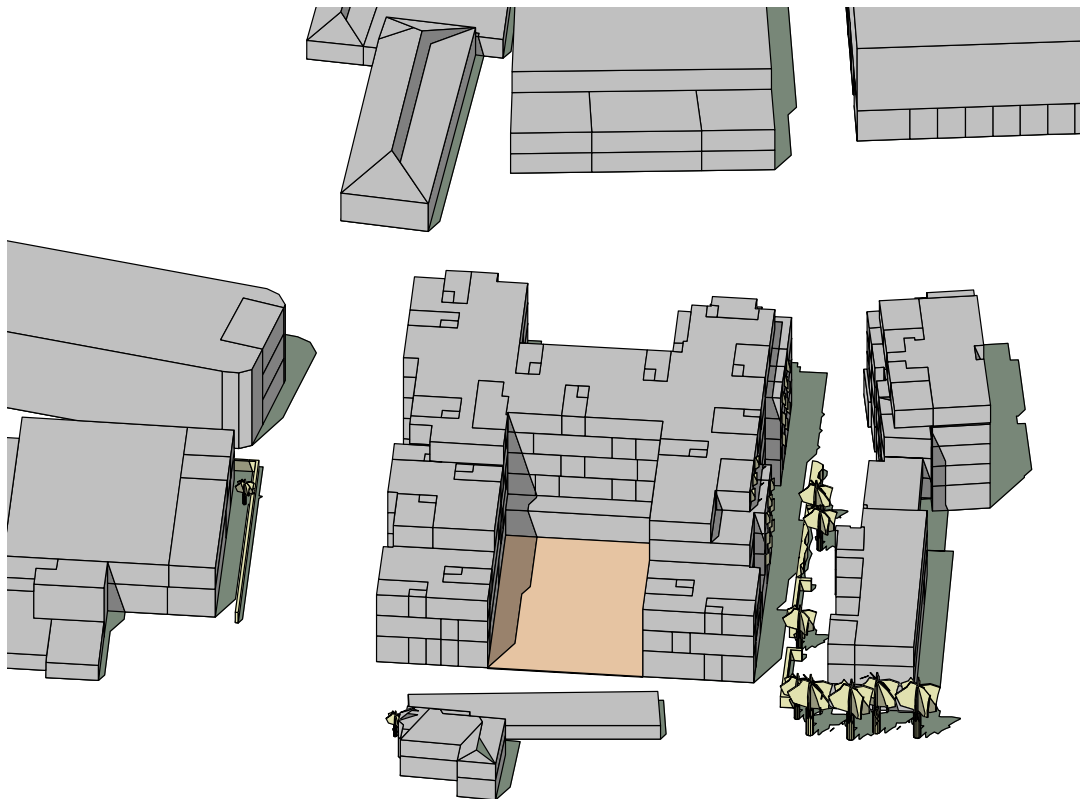


Figure 9 Summer Solstice at 12:00pm

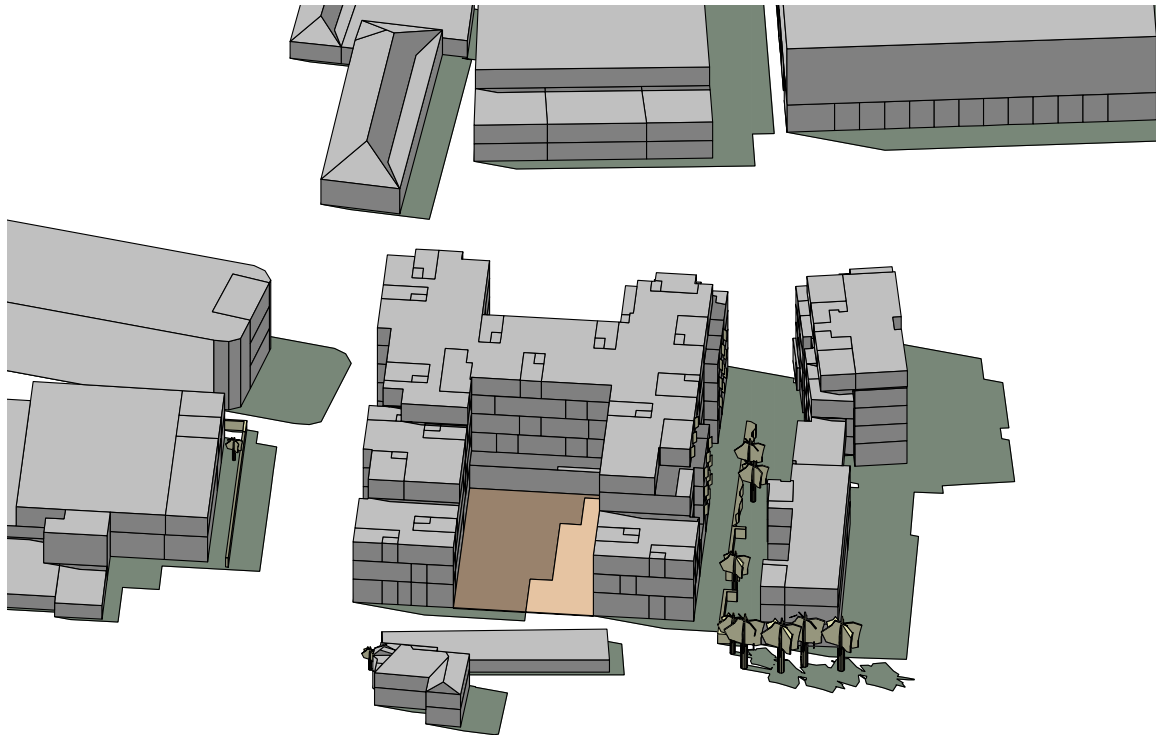


Figure 10 Summer Solstice at 17:00pm

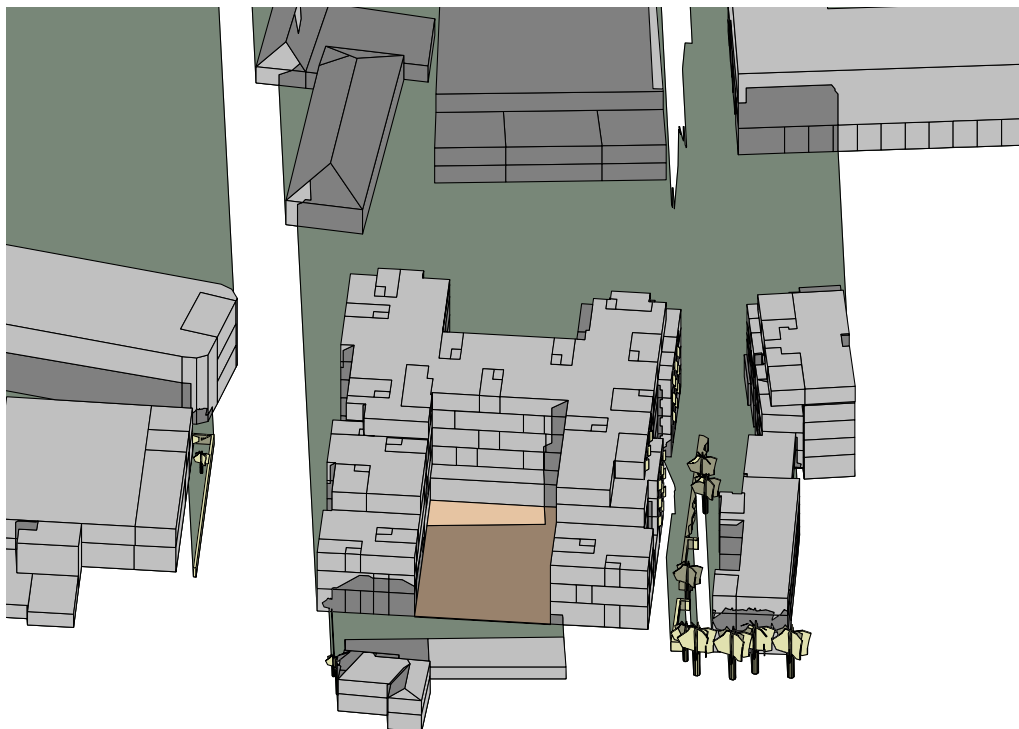


Figure 11 Winter Solstice at 9:00am



Figure 12 Winter Solstice at 12:00pm

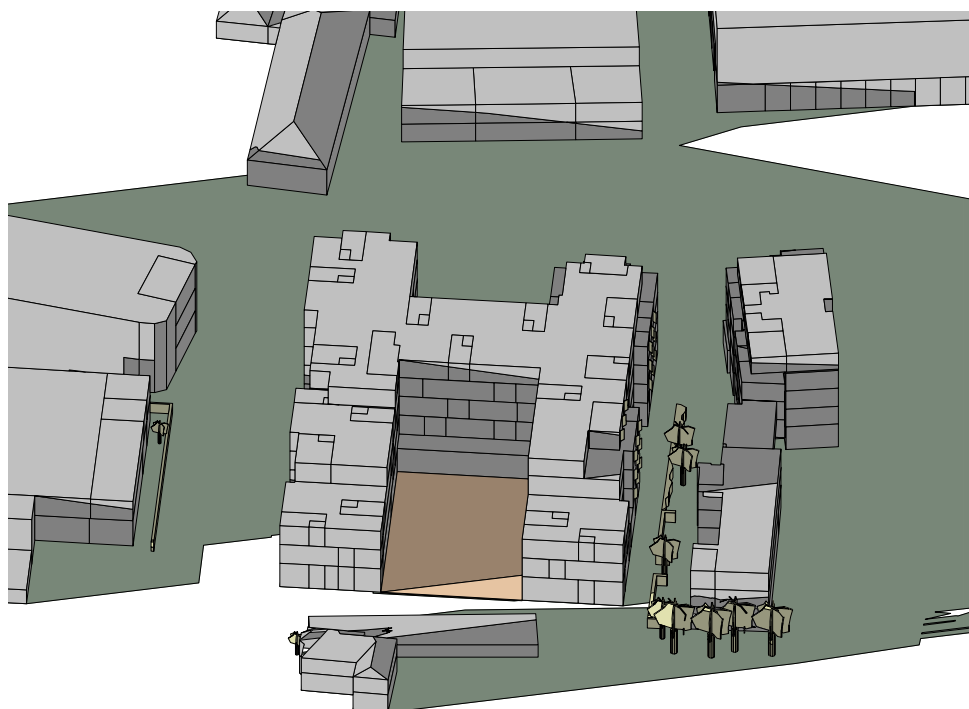


Figure 13 Winter Solstice at 15:00pm

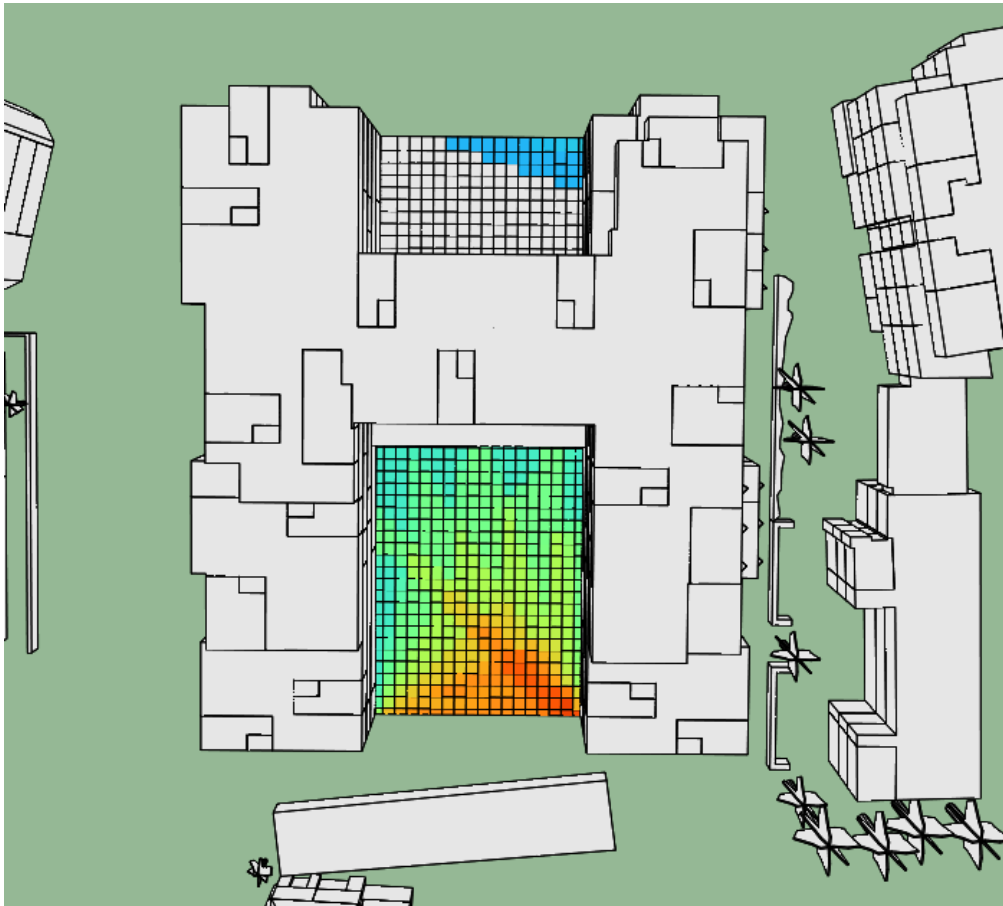


Figure 14 Areas with more than 2 hours of sun on the 21 of March

CONCLUSIONS

This report is presenting the results of the detailed daylight, sunlight and shading analysis of the proposed development located at the 19 Between Towns Road.

Based on the site layout and the proposed drawings, it is clearly shown that the 19 Between Towns Road property will have adequate access to daylight and sunlight.

The majority of the rooms (68%) achieve a VSC above the requirements. Daylight factor results are showing that most of the tested rooms (97%) will pass the recommended ADF by a high margin, proving that the rooms have good access to daylight. Furthermore, the Sky Line is met for virtually all the tested rooms. The windows that pass the APSH metric correspond to 51% of the total tested windows. The failing windows are facing within 90 degrees of due north, and as BRE states, it is difficult to achieve good APSH (i.e. above 25%). However, the rooms' ADFs indicate that they will receive adequate daylight in accordance with their use.

Finally, the shading analysis showed that the Southern courtyard has good access to sunlight, whereas the Northern courtyard will not perform very well due to its orientation.