

## APPENDIX 13.1

# SUNLIGHT AND DAYLIGHT ASSESSMENT

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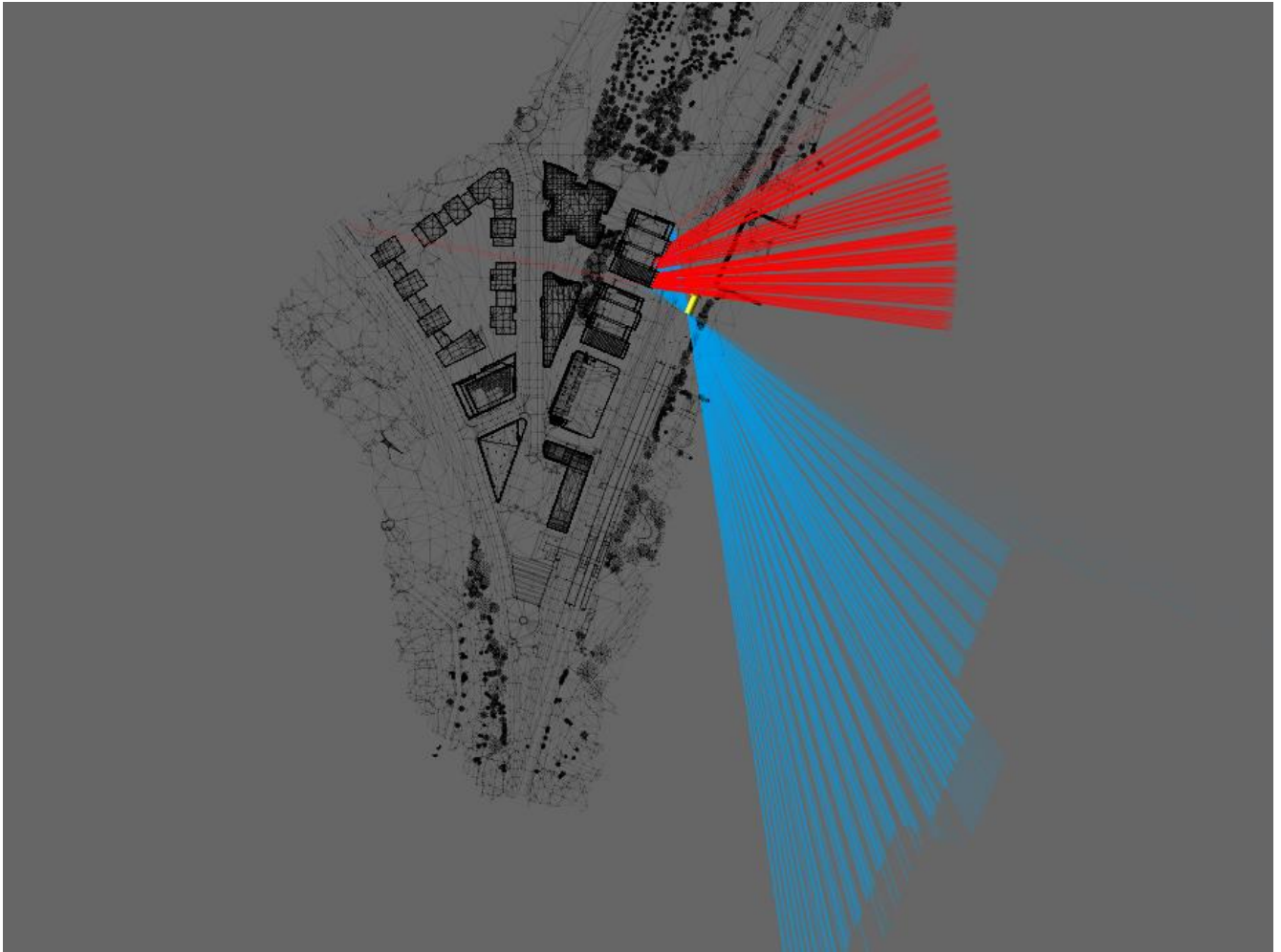
Brookgate

## Cambridge North

001

Reference: Lighting Assessment

001 | 5 May 2022



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## Drawings

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## Appendices

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# 1. Appendix 13.1 – Sunlight and Daylight Assessment

## 1.1 Introduction

A sunlight and daylight assessment has been carried out for the surrounding buildings and areas to the proposed development at Cambridge North. This Appendix presents the raw data which is commented upon in the main body of the Environmental Impact Assessment report, Chapter 13 Lighting.

## 1.2 Methodology and assumptions

The effects of the proposed development on sunlight and daylight availability are calculated based on the guidance of the document *BR 209 - Site layout planning for daylight and sunlight – A guide to good practise, Second edition. Paul Littlefair, BRE, 2011*. This is a de facto standard in the design of developments to optimise daylight and sunlight availability.

A study area has been defined based on BR 209 guidance. Within the study area are two buildings: Novotel Cambridge North and One Cambridge Square.

On the boundary to the study area, several open areas can be found.

These have all been included: Wild Habitat, Allotments, Green area A and green area B. The study also includes the amenity areas which are part of the proposed development, these are presented for information only. It is important to note that the Wild Habitat area is also part of the public open space proposed as part of the planning application.

The following diagram shows the location of the proposed development and the surrounding buildings and areas.

**Figure 1 - Study area for sunlight and daylight availability assessment.**





The following images show the configuration of proposed and baseline conditions, which are used in the assessment to determine the effects of the proposed development on its surroundings.

It can be observed that with the exception of Novotel Cambridge North and One Cambridge Square, no other building receptors are near the proposed development, which is separated to the East by the rail tracks and to the west by the Cambridgeshire Guided Busway (CGB). To the south of the site is Cambridge North railway station.

Receptors have been located as recommended by the BR 209 guidance document, thus at the centre of the existing windows for buildings and over the ground for surrounding areas. One Cambridge Square is an office building with open plan and as per BR 209 guidance is not included in the assessment.

The longitude and latitude of the site has been used to simulate the solar path. This has been taken as 52.2° N and 0.16°E.

In the case of the sunlight assessment for open areas, two sets of results are presented, one considering the effects of vegetations and trees, and one without. In the case of the allotments, the assessment including trees allows to evaluate the effect of the proposed development on solar exposure to the crop.

**Figure 2 - baseline model (left) vs proposed condition model (right).**

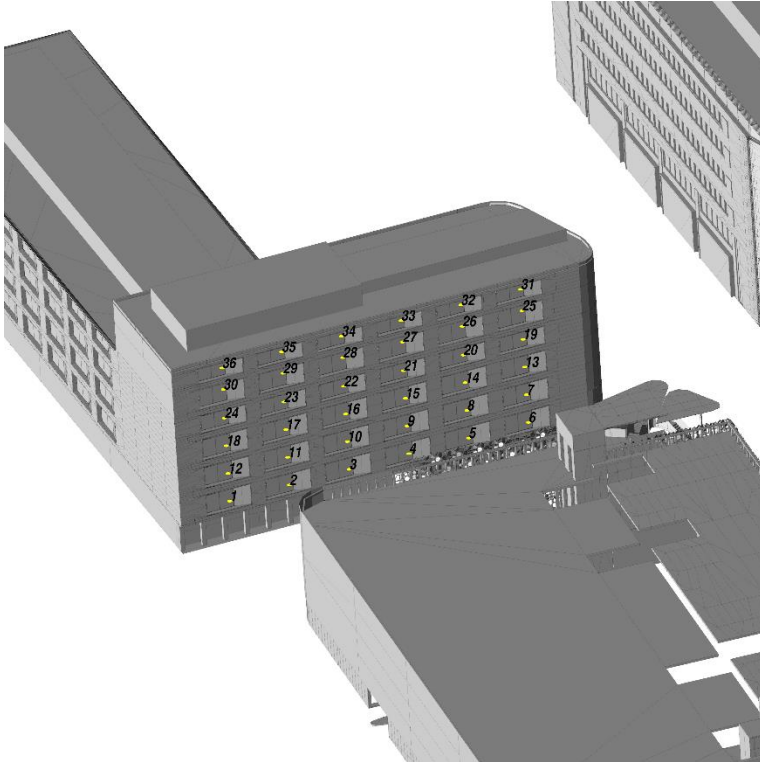


## 1.3 Effects of the proposed development on surrounding properties

### 1.3.1 Locations of Receptors

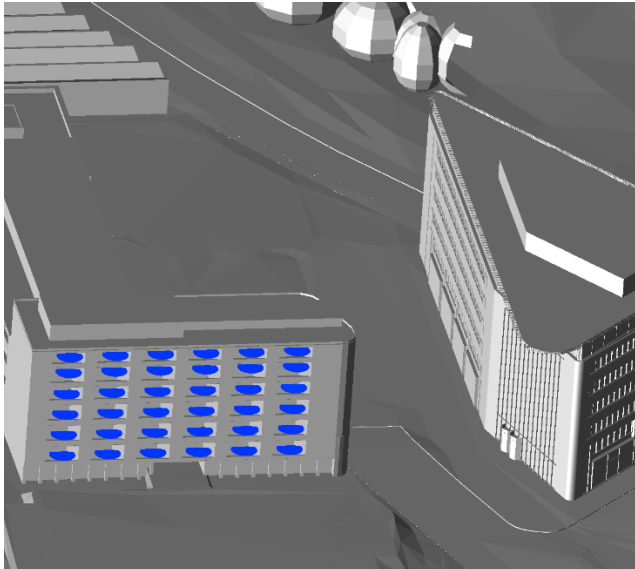
The following diagrams show the location and designation of the receptors included in the assessment.

Figure 3 – Receptor's designations and positions - Novotel Cambridge North.

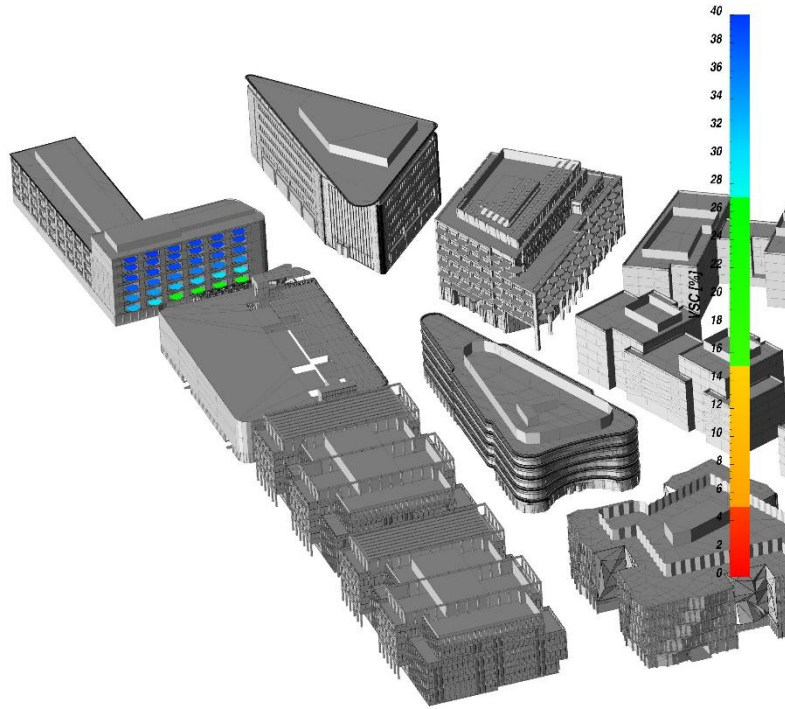


### 1.3.2 Results of the assessment

Figure 4 - Vertical Sky Component, baseline (all receptors achieve a VSC of 40 as the site is unobstructed).



**Figure 5 - Vertical sky component, proposed condition.**

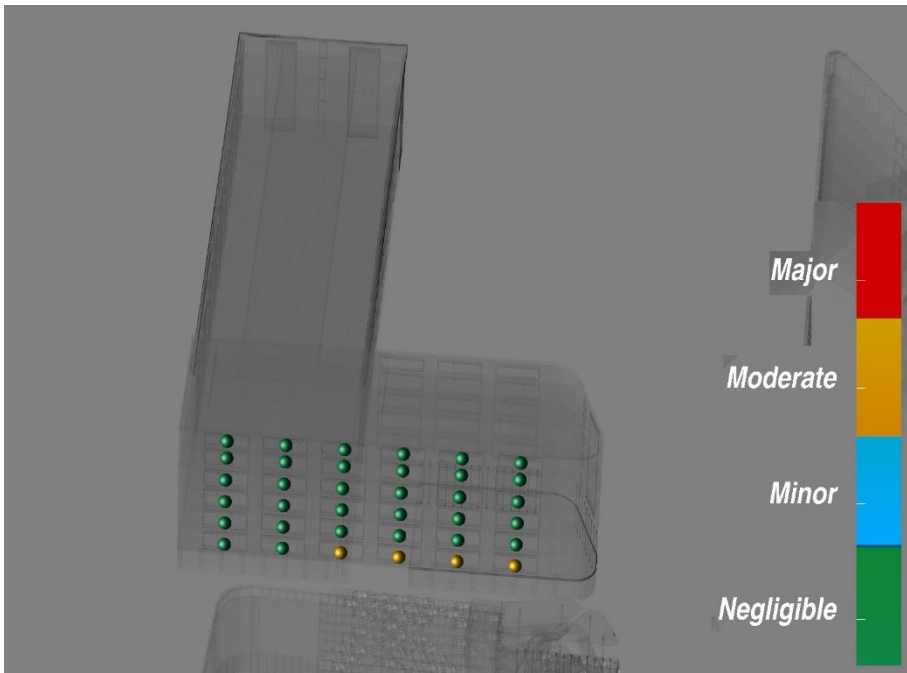


**Table 1 - Sunlight and daylight availability for surrounding properties.**

Point Designation	Building	VSC Baseline	VSC Proposed	Effect On daylight	PASH Baseline	PASH Proposed	PWSH Baseline	PWSH Proposed	Effects on Sunlight
1	Novotel Cambridge North	40	32.5	Negligible	-	-	-	-	-
2	Novotel Cambridge North	40	29.5	Negligible	-	-	-	-	-
3	Novotel Cambridge North	40	26.5	Moderate (66%)	-	-	-	-	-
4	Novotel Cambridge North	40	25.5	Moderate (64%)	-	-	-	-	-
5	Novotel Cambridge North	40	25.5	Moderate (64%)	-	-	-	-	-
6	Novotel Cambridge North	40	24.5	Moderate (61%)	-	-	-	-	-
7	Novotel Cambridge North	40	29	Negligible	-	-	-	-	-
8	Novotel Cambridge North	40	30	Negligible	-	-	-	-	-
9	Novotel Cambridge North	40	31	Negligible	-	-	-	-	-
10	Novotel Cambridge North	40	32	Negligible	-	-	-	-	-
11	Novotel Cambridge North	40	34	Negligible	-	-	-	-	-

Point Designation	Building	VSC Baseline	VSC Proposed	Effect On daylight	PASH Baseline	PASH Proposed	PWSH Baseline	PWSH Proposed	Effects on Sunlight
12	Novotel Cambridge North	40	35	Negligible	-	-	-	-	-
13	Novotel Cambridge North	40	35	Negligible	-	-	-	-	-
14	Novotel Cambridge North	40	36	Negligible	-	-	-	-	-
15	Novotel Cambridge North	40	36	Negligible	-	-	-	-	-
16	Novotel Cambridge North	40	36.5	Negligible	-	-	-	-	-
17	Novotel Cambridge North	40	37.5	Negligible	-	-	-	-	-
18	Novotel Cambridge North	40	38	Negligible	-	-	-	-	-
19	Novotel Cambridge North	39.5	38	Negligible	-	-	-	-	-
20	Novotel Cambridge North	40	38.5	Negligible	-	-	-	-	-
21	Novotel Cambridge North	40	38.5	Negligible	-	-	-	-	-
22	Novotel Cambridge North	40	39	Negligible	-	-	-	-	-
23	Novotel Cambridge North	40	39.5	Negligible	-	-	-	-	-
24	Novotel Cambridge North	40	39.5	Negligible	-	-	-	-	-
25	Novotel Cambridge North	40	39.5	Negligible	-	-	-	-	-
26	Novotel Cambridge North	40	39.5	Negligible	-	-	-	-	-
27	Novotel Cambridge North	40	39.5	Negligible	-	-	-	-	-
28	Novotel Cambridge North	40	39.5	Negligible	-	-	-	-	-
29	Novotel Cambridge North	40	39.5	Negligible	-	-	-	-	-
30	Novotel Cambridge North	40	39.5	Negligible	-	-	-	-	-
31	Novotel Cambridge North	40	39.5	Negligible	-	-	-	-	-

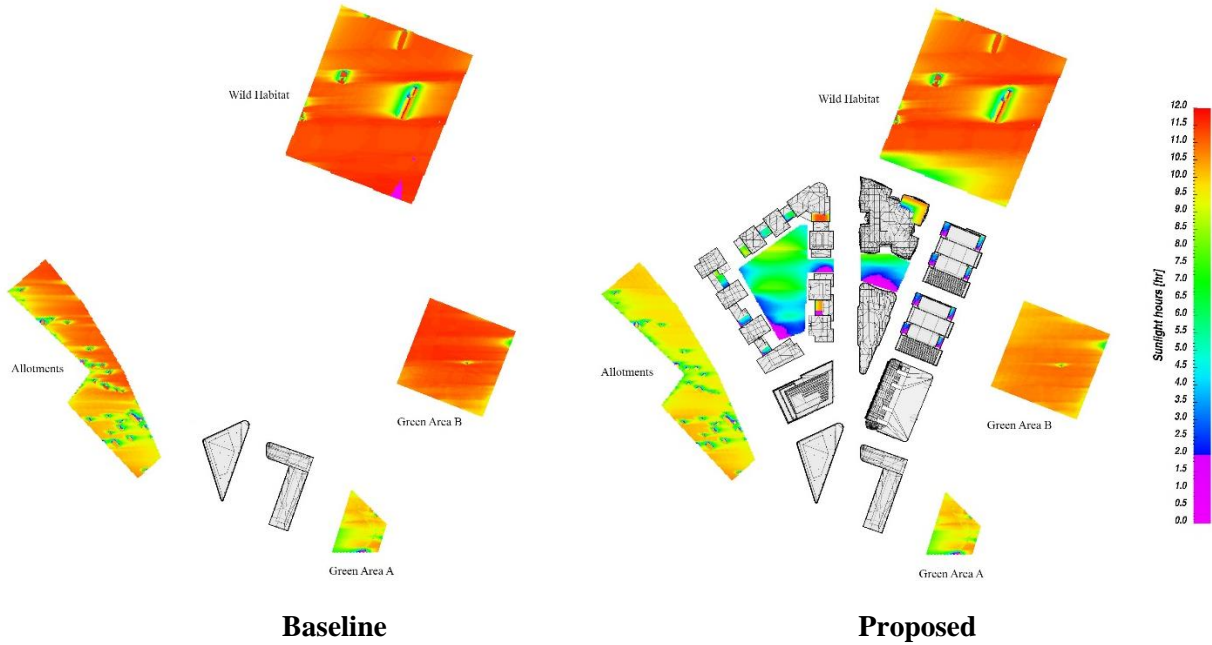
Figure 6 - Effects on surrounding properties for daylight availability. All receptors but 4 show a negligible effect. 4 receptors are considered to have a moderate effect. These record a VSC in the range of 24.5 to 26.5, which is very close to the target of 27%.



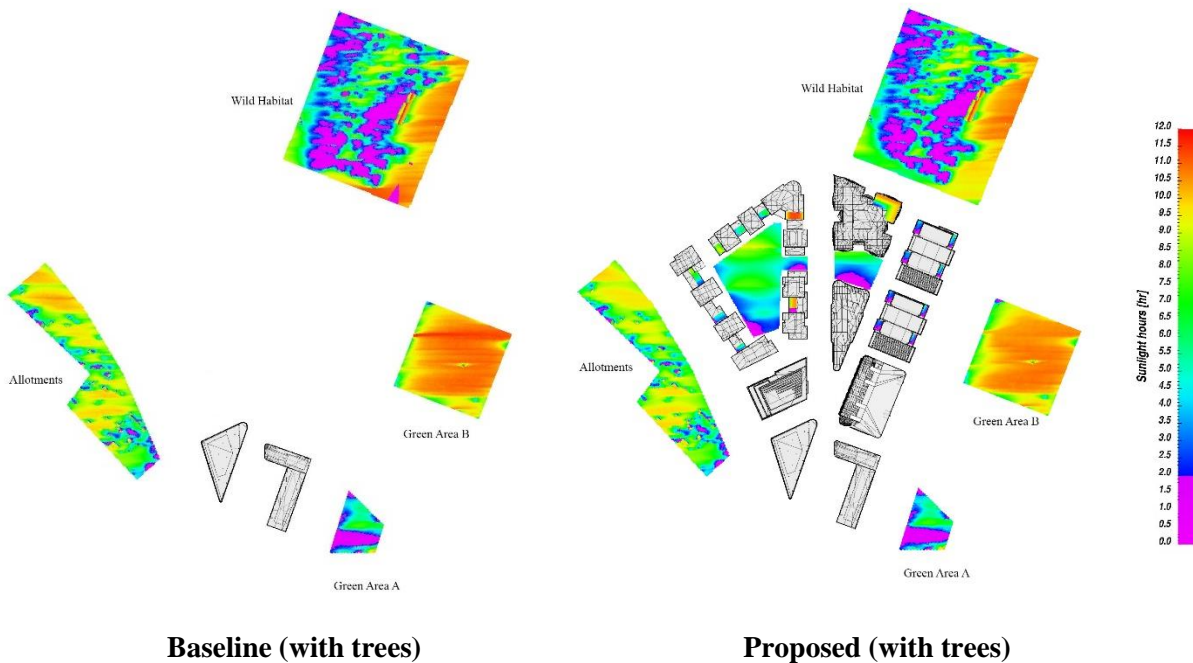
## 1.4 Effects of the proposed development on surrounding areas

The following diagrams show the distribution of sunlight on the 21<sup>st</sup> of March in the areas surrounding the proposed development. Note, the proposed condition diagrams also include the future open areas. These are green spaces between the proposed building blocks and on roof terraces.

**Figure 7 - Comparative distribution of solar exposure for the 21st of March in the areas surrounding the proposed development; baseline (left) and proposed condition (right). Excluding effect of the trees.**



**Figure 8 - Comparative distribution of solar exposure for the 21st of March in the areas surrounding the proposed development; baseline (left) and proposed condition (right). Including the effect of trees.**



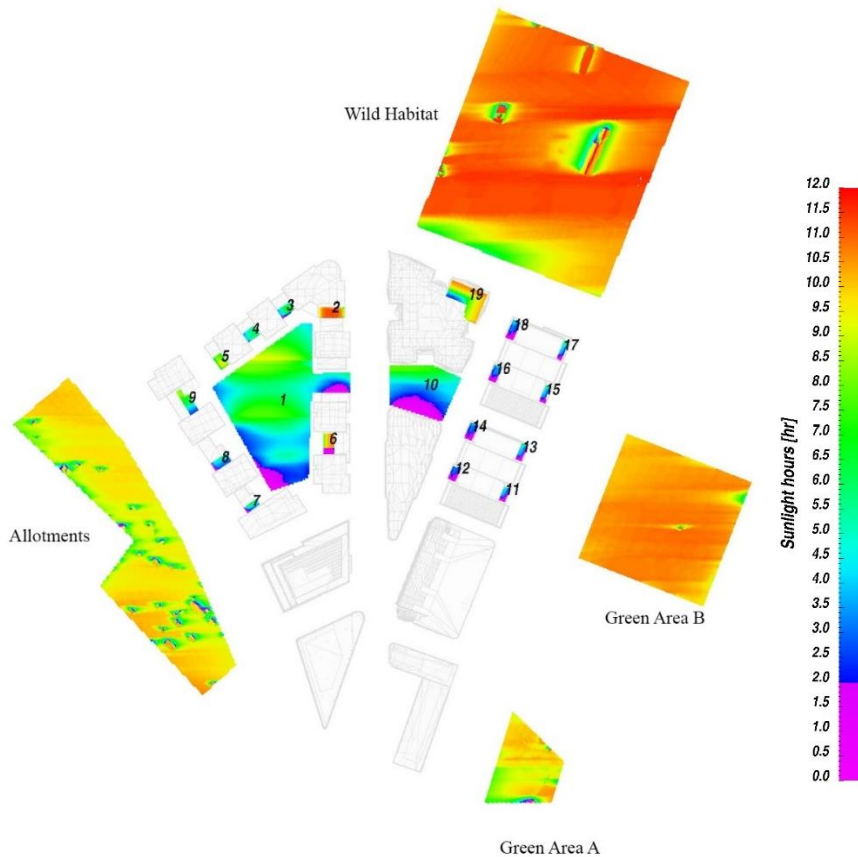
**Table 2 - Summary of solar exposure data in the areas surrounding the proposed development for 21st of March. In brackets are the values including trees. The target is 50% or more.**

Area Designation	Baseline		Proposed	
	Average hours of direct solar exposure on 21st of March	Percentage of area receiving more than 2 hours on 21st of march	Average hours of direct solar exposure on 21st of March	Percentage of area receiving more than 2 hours on 21st of march
Wild Habitat	10.9 (5.4)	100.0 (79.3)	10.6 (5.4)	100.0 (79.3)
Green Area B	11.1 (10.2)	100.0 (100.0)	10.5 (9.9)	100.0 (99.8)
Green Area A	9.3 (3.5)	99.7 (67.5)	9.3 (3.5)	99.7 (65.8)
Allotments	9.9 (7.7)	99.6 (97.1)	9.2 (7.4)	99.6 (96.6)

### 1.5 Effects of the proposed development on future amenity areas

The following diagram shows the numerical designation of the areas analysed, including the future amenity areas and their solar exposure as recorded in the table below.

**Figure 9 - Numerical designation for the areas analysed and distribution of solar exposure on 21<sup>st</sup> of March.**



**Table 3 – Effects of the proposed development of future amenity areas. The target for the percentage of area receiving more than 2 hours on 21st of march is 50% or more.**

Grid Designation	Grid ID	Baseline		Proposed	
		Average hours of direct solar exposure on 21st of March	Percentage of area receiving more than 2 hours on 21st of march	Average hours of direct solar exposure on 21st of March	Percentage of area receiving more than 2 hours on 21st of march
Wild Habitat	n.a.	-	-	10.6	100.0
Residential courtyard	1	-	-	5.3	94.9
Roof garden	2	-	-	10.3	96.6
Roof garden	3	-	-	5.3	97.0
Roof garden	4	-	-	5.2	100.0
Roof garden	5	-	-	8.2	100.0
Roof garden	6	-	-	7.3	72.4
Roof garden	7	-	-	3.9	87.5
Roof garden	8	-	-	3.6	91.0
Roof garden	9	-	-	5.8	100.0
Open Area	10	-	-	3.8	77.7
Roof garden	11	-	-	2.3	55.0
Roof garden	12	-	-	1.9	55.3
Roof garden	13	-	-	2.7	60.4
Roof garden	14	-	-	2.1	61.8
Roof garden	15	-	-	2.9	69.2
Roof garden	16	-	-	2.4	67.3
Roof garden	17	-	-	3.2	78.6
Roof garden	18	-	-	2.3	63.1
Roof garden	19	-	-	8.5	100.0