



**Residential Development at Truskey East, Truskey West,
Freeport and Ahaglugga, Bearna, Co. Galway
Overshading Analysis Report**

19832-VCE-ZZ-ZZ-RP-ME-002

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1. EXECUTIVE SUMMARY

- 1.1. The purpose of this report is to evaluate the potential overshadowing impact of the proposed apartment blocks at Heather Hill residential development at Truskey East, Truskey West, Freeport and Ahaglugger, Bearna, Co. Galway on adjacent residential properties surrounding the development site and proposed housing within the site.
- 1.2. To evaluate the potential impact, analysis was carried out in terms of both overshadowing and Vertical Sky Component (VSC) which quantifies any reduction in light to windows.
- 1.3. The analysis concluded that the proposed development is in compliance with BRE guidance for "Site Layout Planning for Daylight and Sunlight".

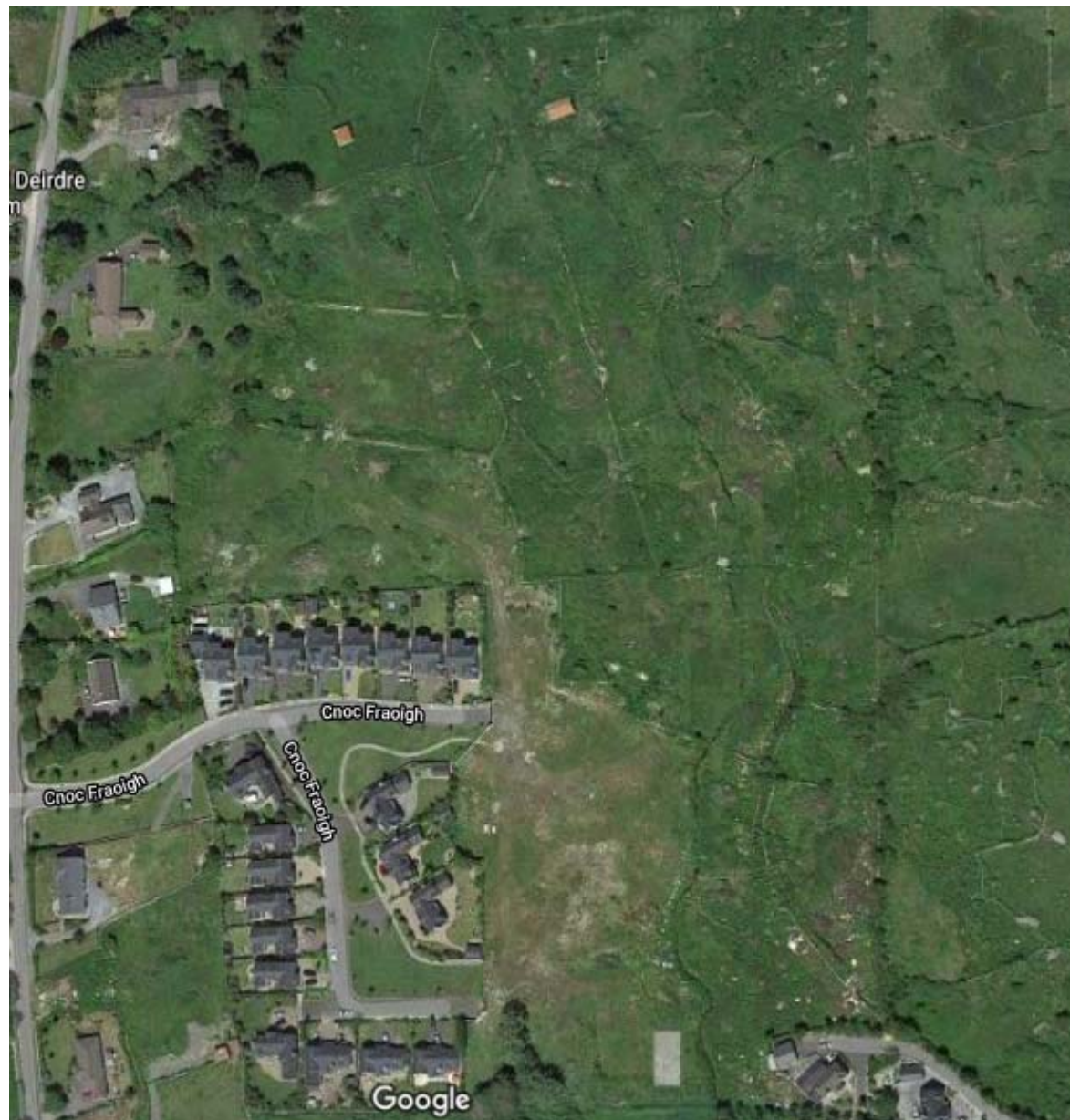


Figure 1 – Indicative Location for Illustrative Purposes

2. INTRODUCTION

- 2.1 Both the site and adjacent buildings are shown in Figure 1 with further details in Section 4.
- 2.2 The proposed residential development and surrounding properties were modelled in IES <Virtual Environmental> and analysed in SunCast which is used to investigate external obstruction and self-shading of a building by generating shading and solar insolation images from any sun position defined by date, time, orientation, site latitude and longitude.
- 2.3 For this evaluation the following coordinates from Google Maps were used;
Latitude: 53°16'52.9"N
Longitude: 9°05'16.0"W
- 2.4 Shadow images were generated at hourly intervals for March 21st and June 21st and are shown in sections 5 and 6 respectively.
- 2.5 BRE guidance states that for existing buildings obstruction of sunlight may be an issue if some part of a new development is situated within 90° due South of a main window wall. From the shading images in Section 5 it was shown that for the house located directly West of the apartment blocks near the site boundary, which falls into the above category, some shading may occur between 7am and 9am on March 21st which is the day taken into account as average conditions between the Summer and Winter Equinoxes.
- 2.6 Hourly images of the front of this dwelling can be seen in Section 7.
- 2.7 The windows on the south façade of this dwelling were further evaluated in terms of Vertical Sky Component to evaluate the potential impact in terms of light reduction. This is simulated using Radiance software over 12 months, using one design day per month. It was found that the impact is within BRE thresholds and therefore is not significant.
- 2.8 The results of this analysis are shown in Section 3.
- 2.9 To quantify the reduction of direct solar radiation of the south facing façade of the dwelling we have included a study of Solar Insolation. This provides hourly and monthly values for the percentage of the surface receiving direct solar radiation. Section 8 shows the values for the existing situation, after the proposed development, and the difference between the two.
- 2.10 Hourly shading evaluation for March 21st for the new site is contained in Section 9.

3. SUNLIGHT TO THE SURROUNDING EXISTING RESIDENTIAL BUILDINGS

The quality and quantity of daylight in an existing residential building can be impacted by obstructions caused by new developments. One indicator suggested by BRE in the guidance document “Site Layout Planning for Daylight and Sunlight” to measure the impact caused is to evaluate the Vertical Sky Component (VSC) at the centre of the lowest window where daylight is required.

The Vertical Sky Component (VSC) is defined as “The ratio of that 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”.

- If the VSC can be maintained above 27%, then enough skylight should still reach the window of an existing building.
- If the resultant VSC is both less than 27% and reduced by more than 20% of its former value after the construction of the proposed development, occupants of the building will notice a reduction in skylight.

The results in Table 1 show that the reduction in VSC caused by the proposed new development is on average 2.46% for the four windows. As this is less than the 20% threshold it will not impact unduly on the adjacent building. In addition the resultant average VSC for the four windows is 39.04 which is above the 27% threshold so enough skylight will still reach the windows to provide adequate daylight.



Zone	Surface	Window	VSC of Window		Impact of Proposed Development on VSC	Meets BRE Guidelines
			Existing	Proposed		
Dwelling	External South Facing Wall	1	40.24	39.46	1.94%	Yes
		2	40.23	38.78	3.60%	Yes
		3	39.56	38.38	2.98%	Yes
		4	40.07	39.55	1.30%	Yes
Average for four windows			40.02	39.04	2.46%	

Table 1 – Vertical Sky Component

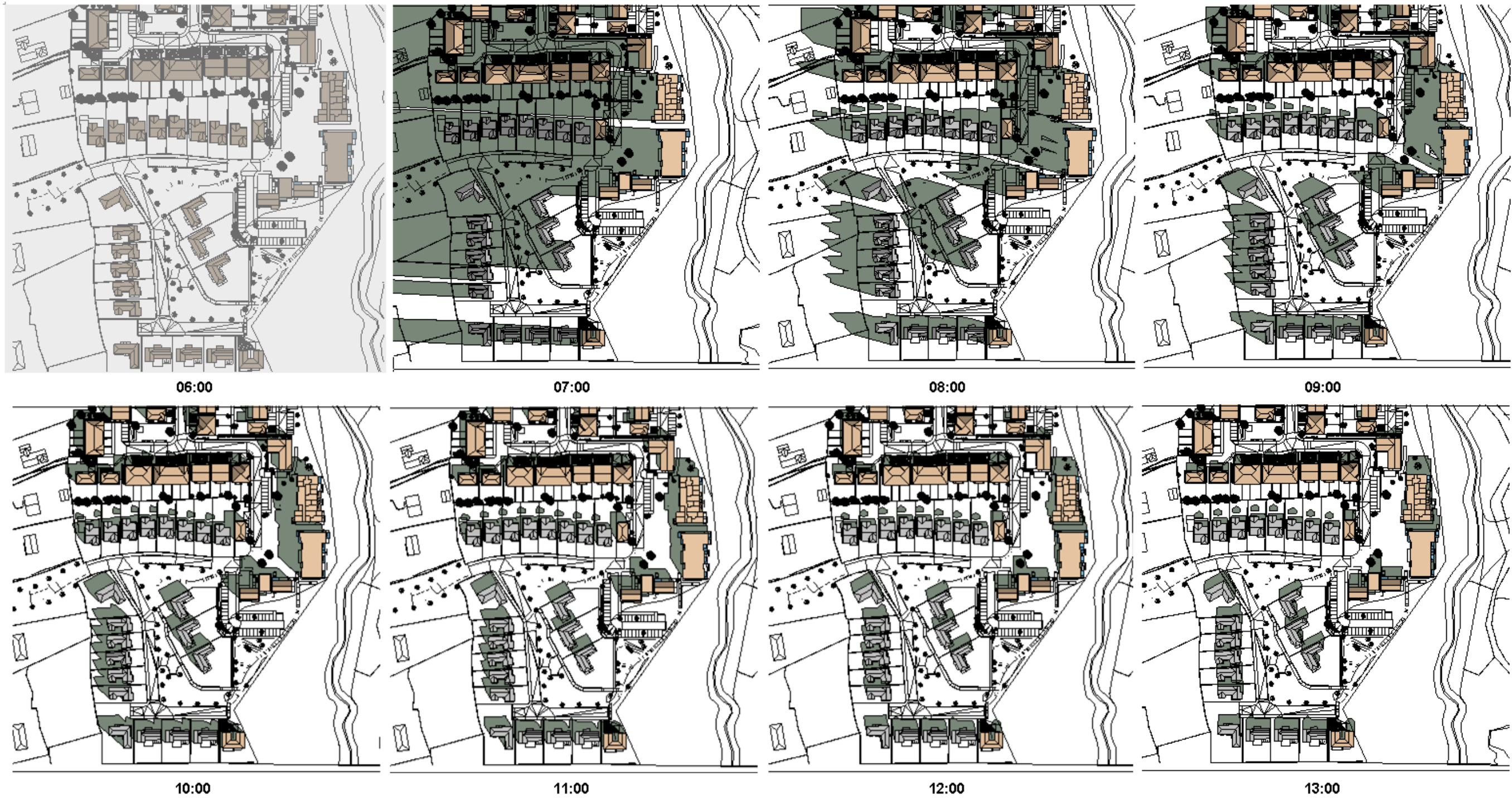
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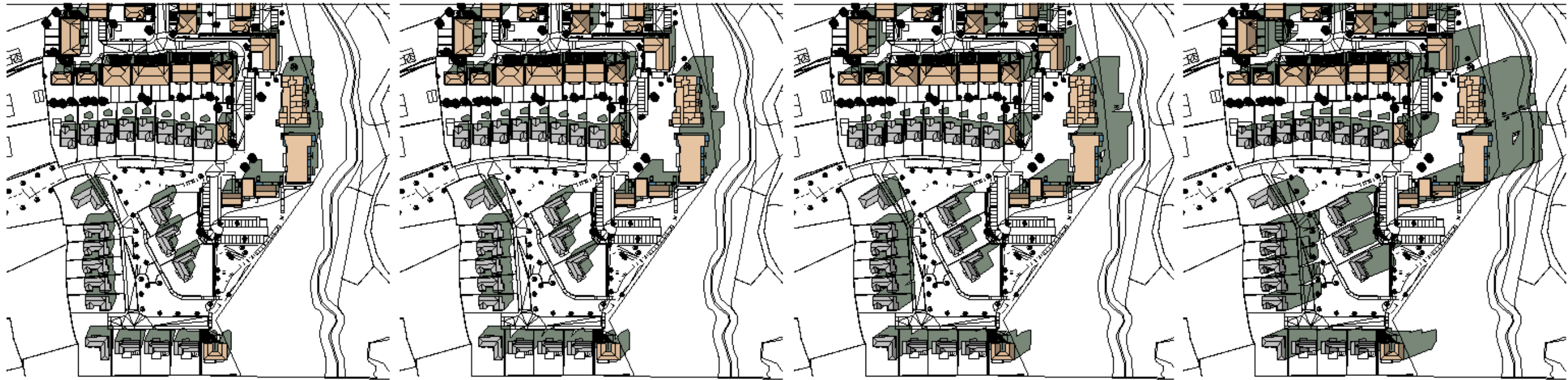
Littlefair, P.J (2011) Site Layout Planning for Daylight and Sunlight, A guide to good practice, BRE

4. ADJACENT BUILDINGS



5. SOLAR SHADING ANALYSIS – 21ST MARCH





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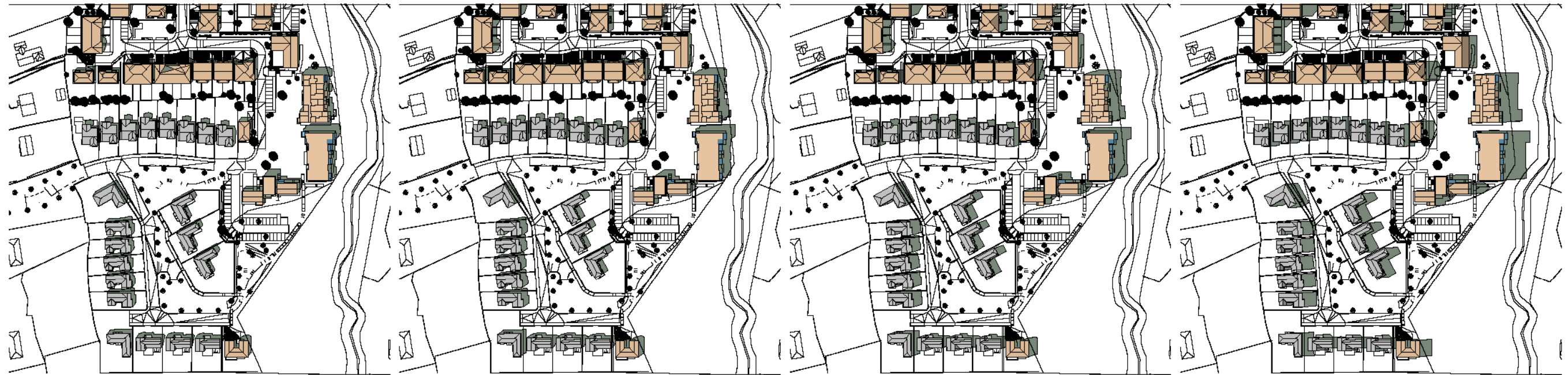
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6. SOLAR SHADING ANALYSIS – 21ST JUNE





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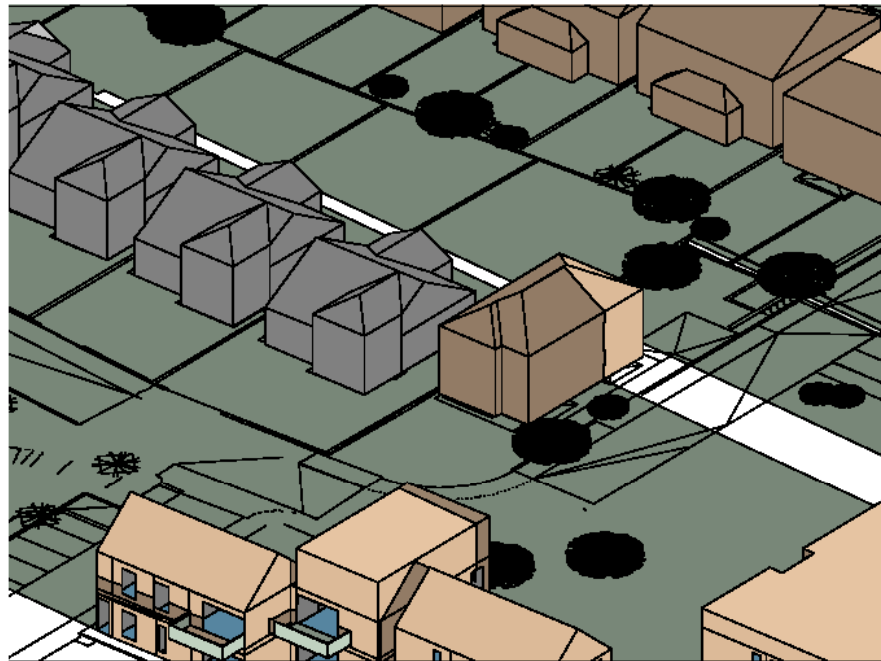
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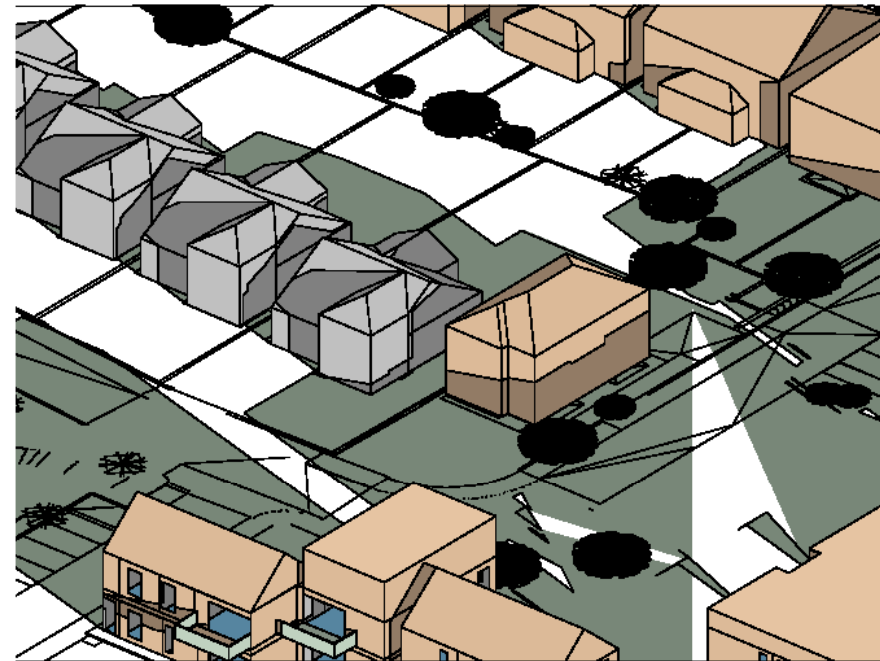
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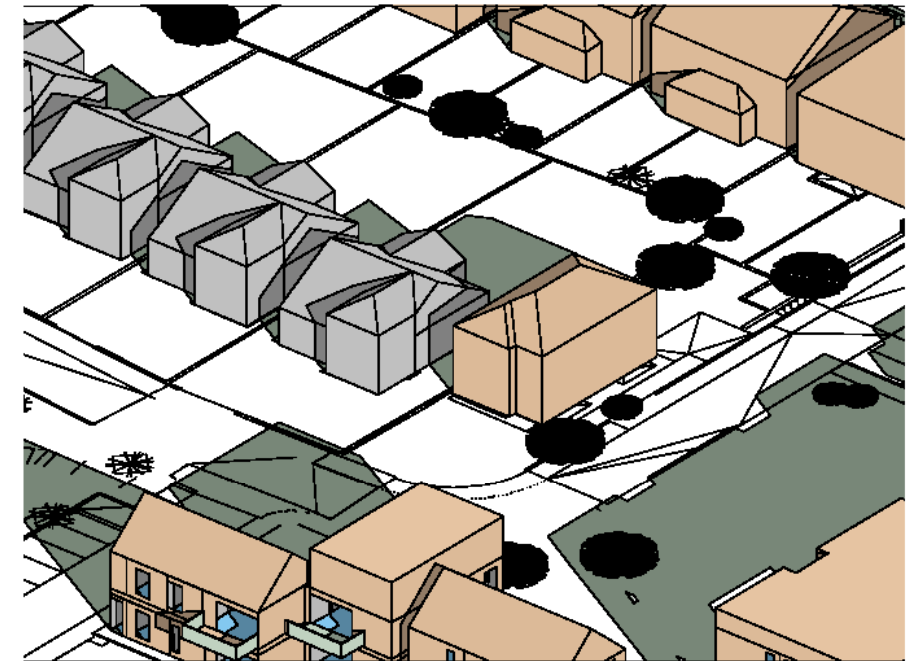
7. SOLAR SHADING ON EXISTING HOUSES 21ST MARCH



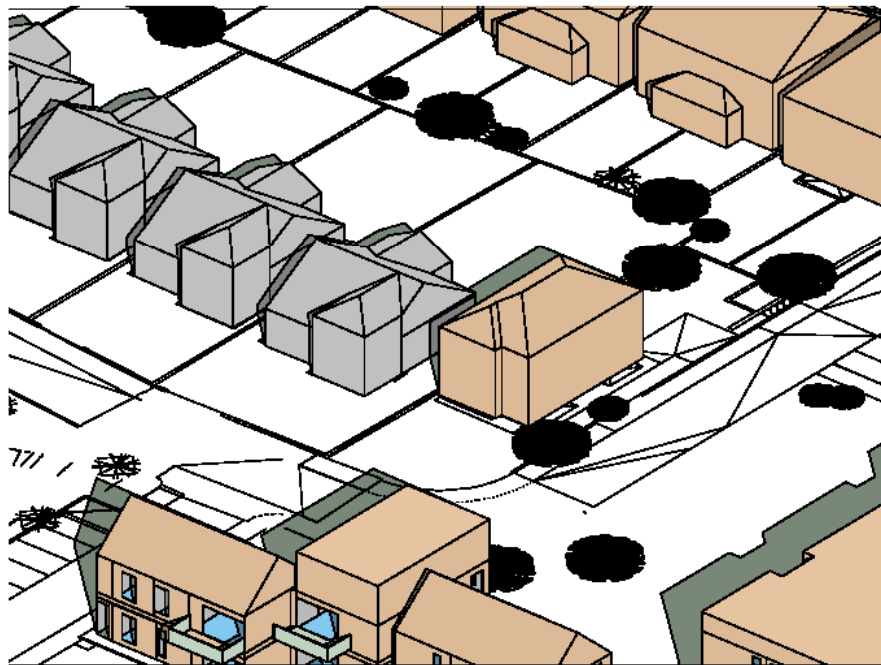
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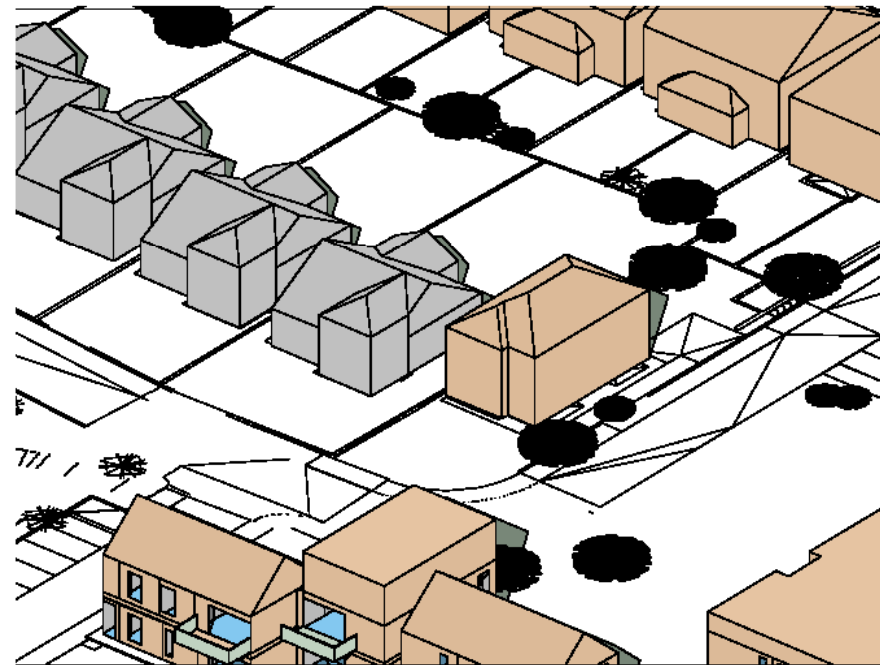
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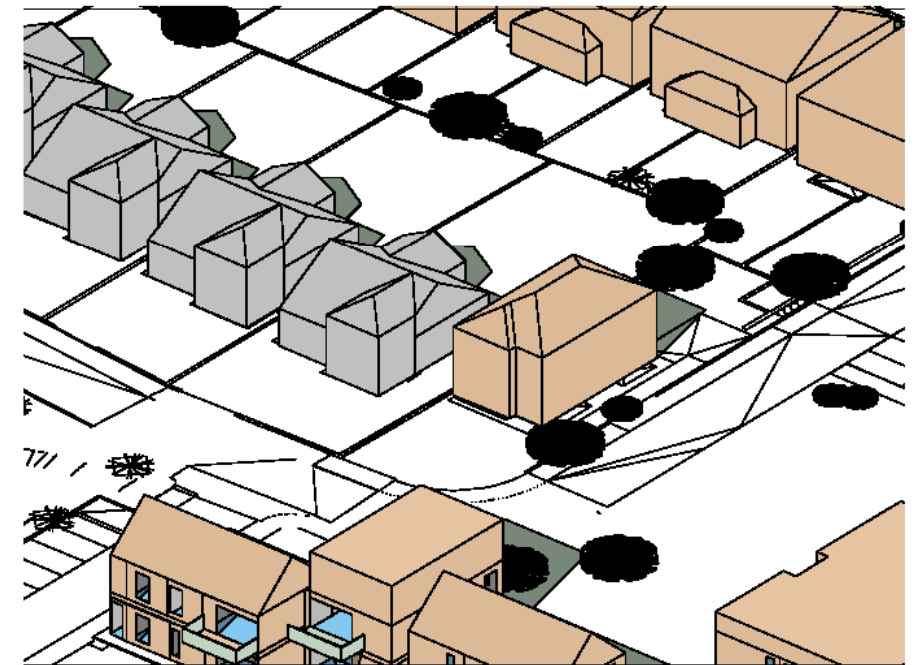
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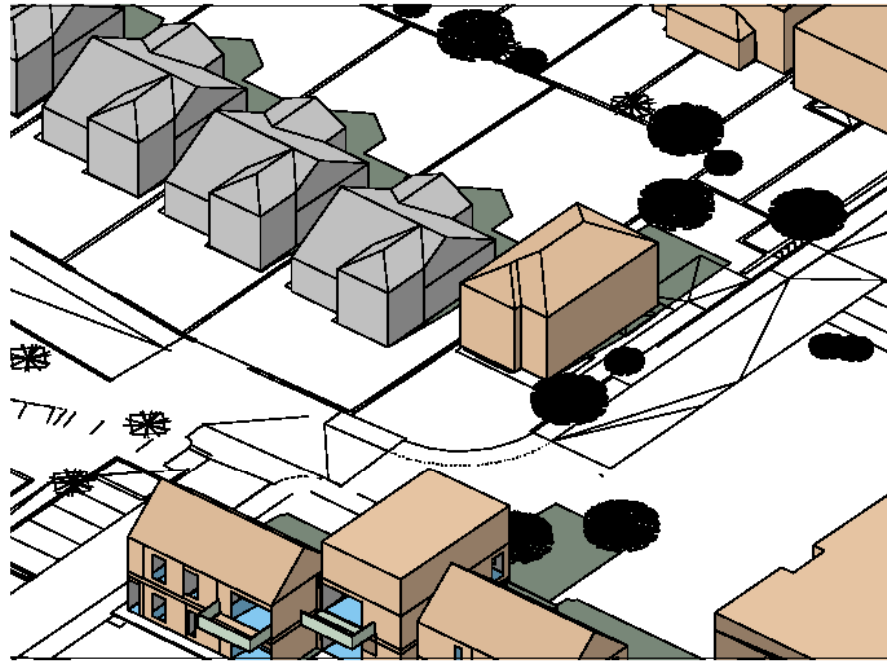
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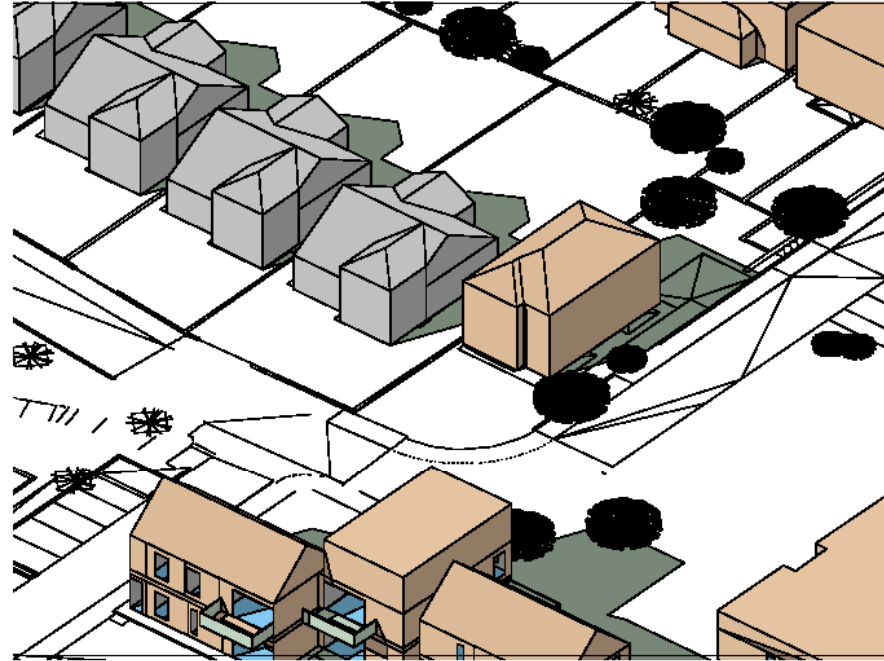
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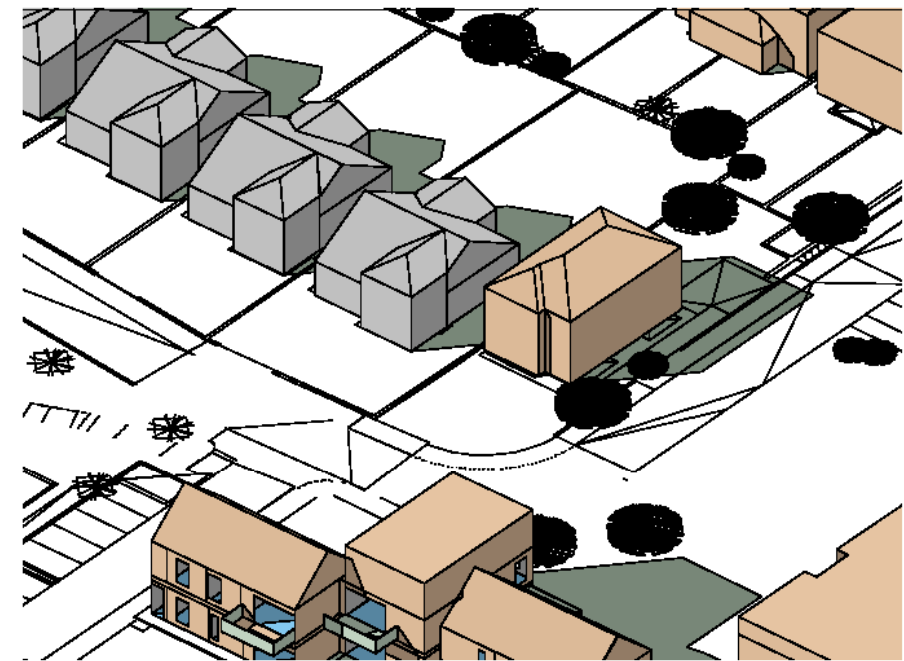
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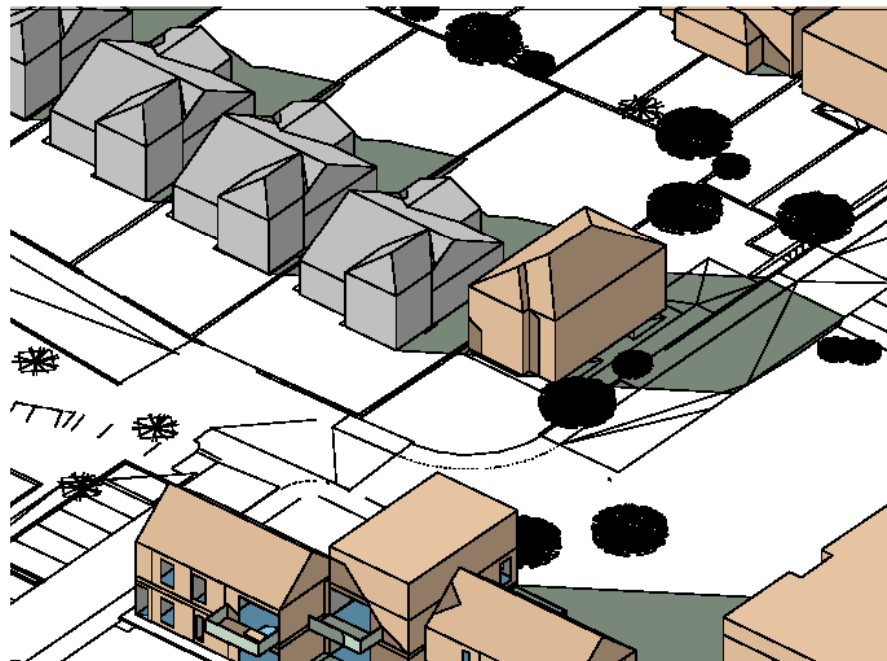
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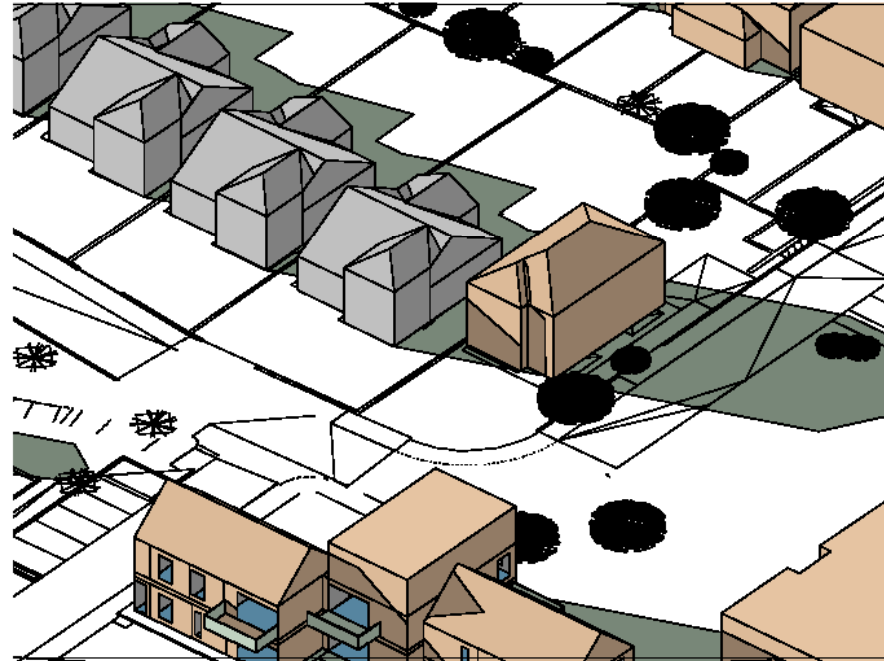
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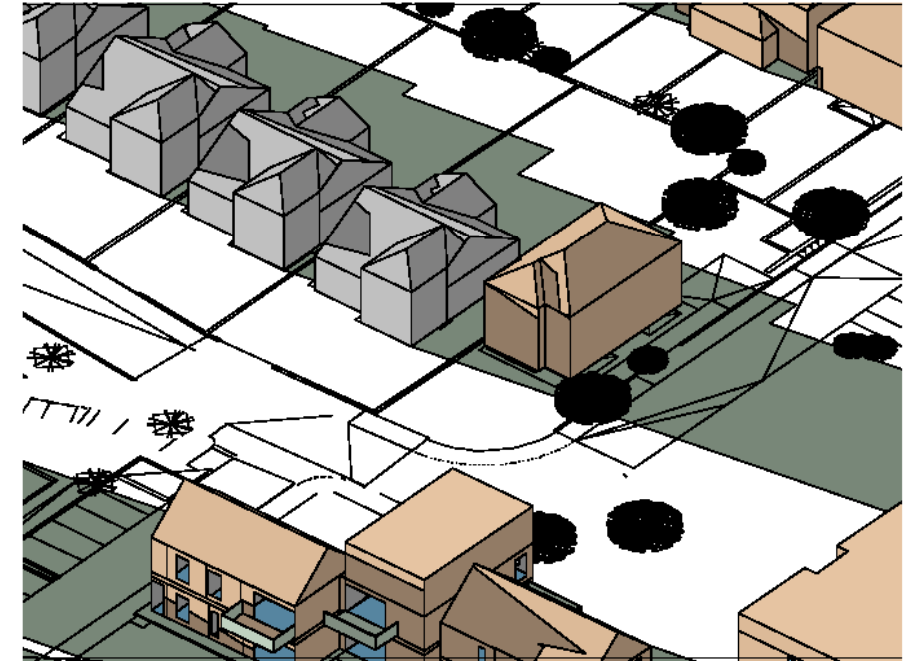
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8. External Solar Insolation Comparison (Cells indicate % of surface receiving direct solar radiation)

100.0 Percentage of façade receiving direct solar radiation

0.0 Façade completely in shadow

-0.0 Percentage reduction in direct solar shading

Existing - External Façade (%)

Month	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00:00
Jan									100	100	100	100	100	100	100	70.2								
Feb									100	100	100	100	100	100	100	100	100							
Mar								100	100	100	100	100	100	100	100	100	100	100						
Apr						0	0	100	100	100	100	100	100	100	100	100	100	100	0					
May					0	0	0	100	100	100	100	100	100	100	100	100	100	0	0	0				
Jun					0	0	0	100	100	100	100	100	100	100	100	100	100	0	0	0				
Jul					0	0	0	100	100	100	100	100	100	100	100	100	100	0	0	0				
Aug						0	0	100	100	100	100	100	100	100	100	100	100	0	0					
Sep							100	100	100	100	100	100	100	100	100	100	100	100						
Oct								100	100	100	100	100	100	100	100	100	82.6							
Nov									100	100	100	100	100	100	100	65.6								
Dec									100	100	100	100	100	100	95.1	0								

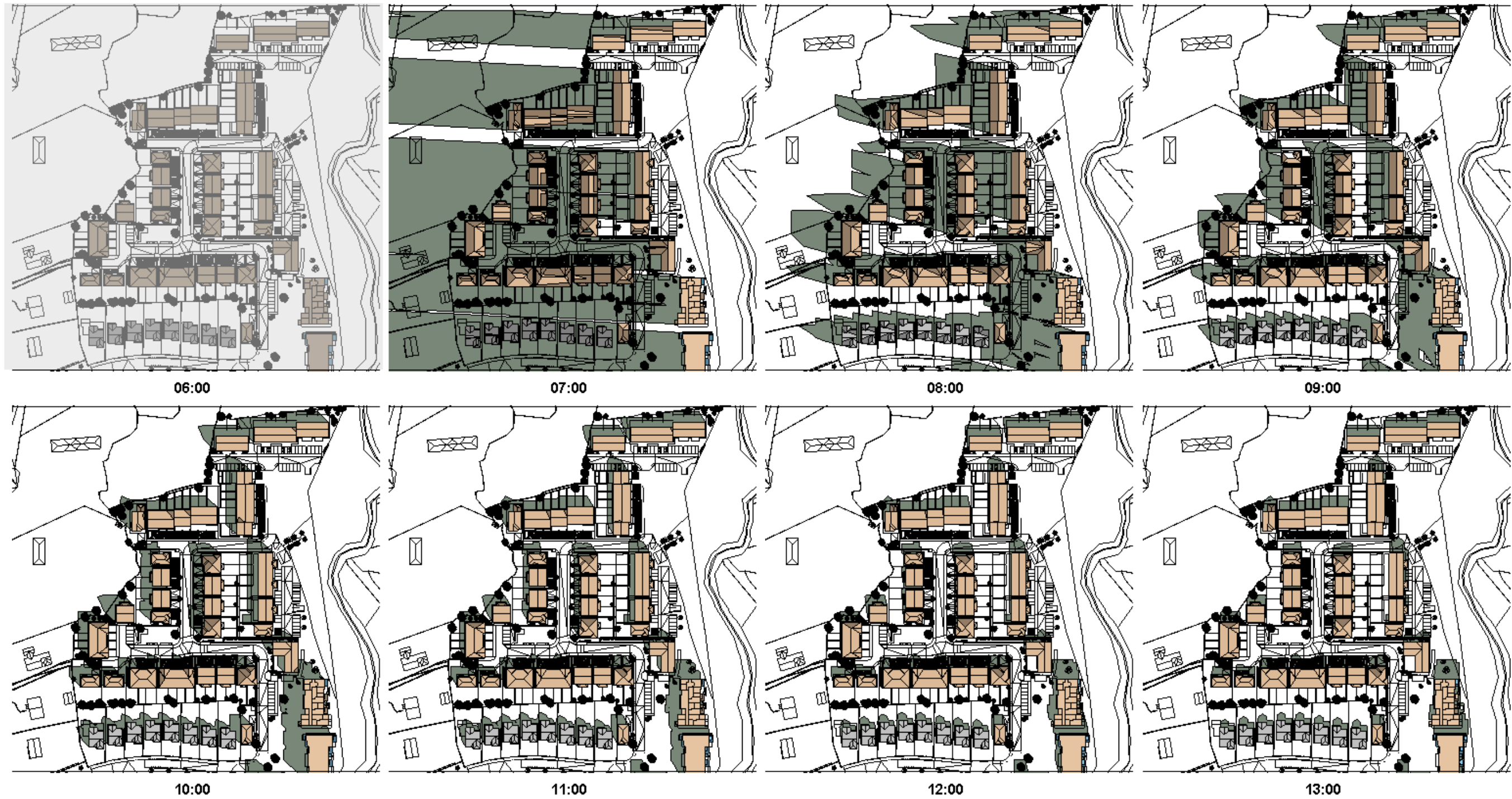
New - External Façade (%)

Month	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00
Jan									0	2.3	64.8	100	100	100	100	70.2								
Feb									12.2	78.3	100	100	100	100	100	100	100							
Mar								36.5	100	100	100	100	100	100	100	100	100	100						
Apr						0	0	100	100	100	100	100	100	100	100	100	100	100	0					
May					0	0	0	100	100	100	100	100	100	100	100	100	100	0	0	0				
Jun					0	0	0	100	100	100	100	100	100	100	100	100	100	0	0	0				
Jul					0	0	0	100	100	100	100	100	100	100	100	100	100	0	0	0				
Aug						0	0	100	100	100	100	100	100	100	100	100	100	0	0					
Sep							0	100	100	100	100	100	100	100	100	100	100	100						
Oct								100	69.2	100	100	100	100	100	100	100	100	82.6						
Nov									0	72.3	100	100	100	100	100	65.6								
Dec									0	3.9	43.7	100	100	100	95.1	0								

Difference in Solar Insolation (%)

Month	01:00	02:00	03:00	04:00	05:00	06:00	07:00	08:00	09:00	10:00	11:00	12:00	13:00	14:00	15:00	16:00	17:00	18:00	19:00	20:00	21:00	22:00	23:00	24:00
Jan									100	97.7	35.2	0	0	0	0	0								
Feb									87.8	21.7	0	0	0	0	0	0	0							
Mar								63.5	0	0	0	0	0	0	0	0	0	0						
Apr						0	0	0	0	0	0	0	0	0	0	0	0	0	0					
May					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Jun					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Jul					0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
Aug						0	0	0	0	0	0	0	0	0	0	0	0	0	0					
Sep							0	0	0	0	0	0	0	0	0	0	0	0						
Oct								0	30.8	0	0	0	0	0	0	0	0							
Nov									100	27.7	0	0	0	0	0	0								
Dec									100	64.9	23.7	0	0	0	0	0								

9. SOLAR SHADING ON PROPOSED DWELLINGS 21ST MARCH



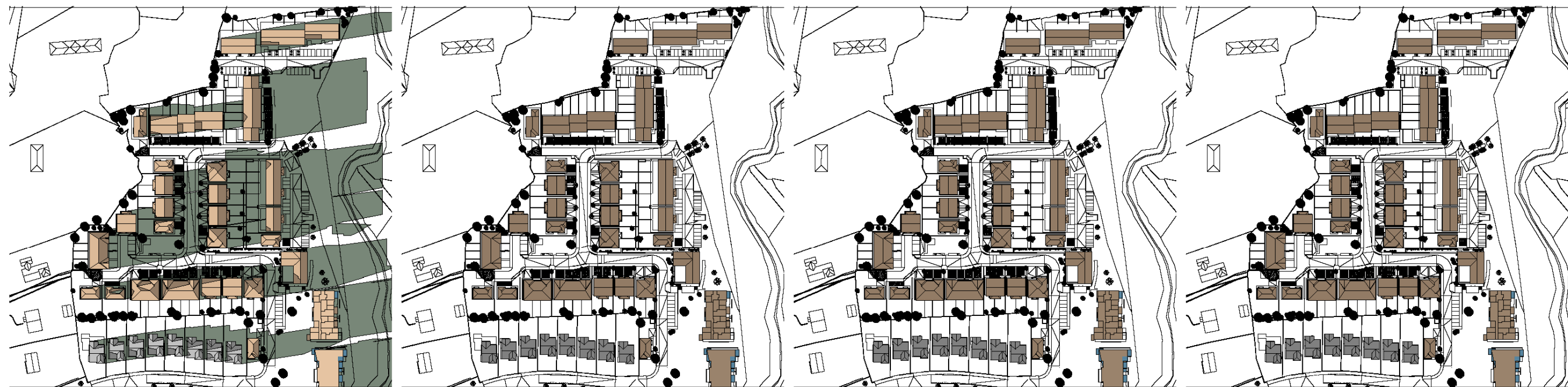


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