



C A R B O N F U T U R E S

24 WEYMOUTH DRIVE

SUNLIGHT ANALYSIS

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EXECUTIVE SUMMARY

Carbon Futures have been commissioned to undertake a sunlight analysis to support the planning submission for the proposed extension to the property at 24 Weymouth Drive, Kelvindale. The scheme comprises of a rear 2-storey extension to a semi-detached property, and this study predicts the impact of this proposal on the rear gardens of the neighbouring properties.

The report responds directly to a request raised by the planner from the original planning submission. The request stated:-

"a sun-on-ground test be undertaken to measure the impact of the proposal on the overshadowing of the neighbouring rear gardens. The test should be performed in accordance with The Building Research Establishment (BRE) document - 'Site Planning for Daylight and Sunlight: A Guide to Good Practice', (PJ Littlefair 1991), as stipulated in the approved development plan (Glasgow City Plan 2). The sun-on-ground test is used to calculate the shadow cast by the proposed extension on the neighbouring ground at 9am, 12pm and 3pm."

As per local planning policy requirements, it has been requested that a sun-on-ground analysis be undertaken in accordance with the Buildings Regulation Establishment (BRE) guidance document, "Site Layout and Planning for Daylight and Sunlight: A Guide to Good Practice" (2011). This methodology advises the use of AP 288 acetone papers to plot the shadow caused by the proposed extension. Following discussions with the BRE, we understand that these papers are no longer available, and such an alternative method of measuring the impact of the extension is proposed.

IES<VE> dynamic modelling software has been used to create a 3D model of the property and its surroundings. Utilising site specific data, the impact of the proposed extension on the neighbouring gardens can be assessed.

When the 'previous proposal' is modelled, the area of garden at 24 Weymouth Drive that receives ≥ 2 hours of sunlight on the 21st March is only predicted to reduce by a maximum of 12%, which is within the limits of BR 209.

When the 'current proposal' is modelled that area reduces to 5%, demonstrating an improvement on the 'previous proposal'

There is no reduction in area to the gardens of 22 Weymouth Drive that receive sunlight.

Therefore both proposed extensions comply with best practice industry guidance and analysis demonstrates that the loss of sunlight to the gardens of 22 and 26 Weymouth drive is unlikely to be noticeable if either of the proposed extensions are constructed.

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1.0 | INTRODUCTION

A sunlight analysis has been carried out to determine the extent of overshadowing on the neighbouring gardens to the rear of the properties at 22 and 26 Weymouth Drive caused by the proposed extension to 24 Weymouth Drive.

This document provides best practice guidance for assessing daylight and sunlight levels in buildings and for safeguarding light to existing buildings, gardens and land.

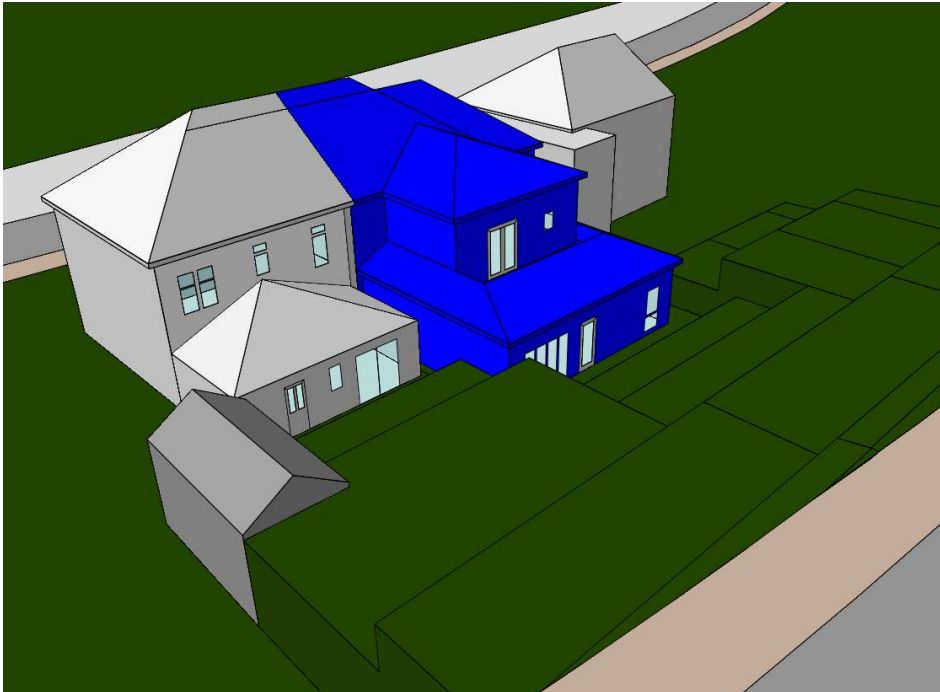


Fig. 1-1: IES<VE> model of current extension proposal

The report address concerns raised that the proposed extension may have a detrimental impact on the provision of sunlight to neighbouring gardens. To demonstrate the impact, the gardens and surrounding building have been assessed in accordance with the Building Research Establishment (BRE) 'Site Planning for Daylight and Sunlight: A Guide to Good Practice' document to fulfil the requirements of the approved Glasgow City development plan.

2.0 | DESIGN CRITERIA

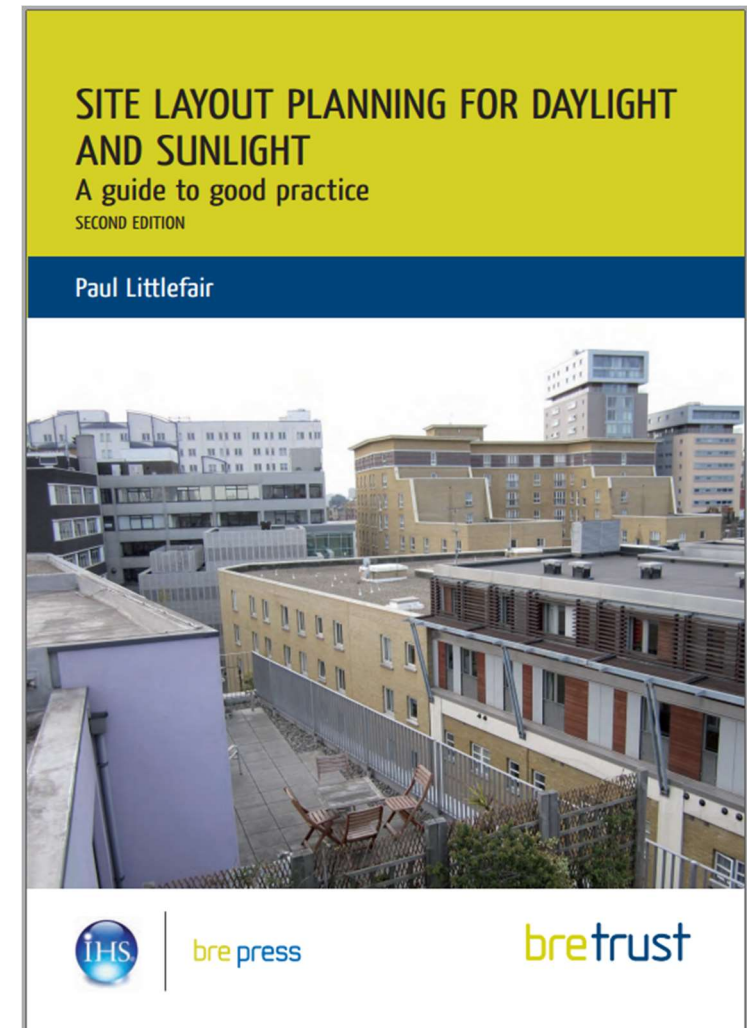
The BRE '*Site Planning for Daylight and Sunlight: A Guide to Good Practice*' document (BRE 209) sets out a methodology for the measurement and assessment of daylight and sunlight within domestic buildings.

This assessment, which focuses on the sun-on-ground, is an analysis of both transient and permanent overshadowing that would be caused by the proposed extension. This allows the likely impact on neighbouring buildings and landscapes to be assessed.

The simplest indicator of sun-on-ground is the availability of sunlight on the ground at the equinox, measured using AP 288 sun-on-ground indicators. These geographically-specific acetone sheets allow the shadow caused by a building to be plotted in 2D.

However, these sheets are no longer in publication by the BRE, so an alternative method of demonstrating impact on sunlight hours has been proposed.
<https://www.brebookshop.com/details.jsp?id=326795>

The alternative method is to undertake a sunlight analysis as per Section 3.3 of BRE 209 to demonstrate that 50% of garden areas receive ≥ 2 hours of sunlight based on the sunlight available to the existing property's gardens.



3.0 | METHODOLOGY

A 3D model of the development, the surrounding properties and landscape / gardens has been constructed within the IES<VE> 2021 integrated suite of applications. An assessment of daylight and sunlight conditions will be carried out using the SunCast module. SunCast is solar shading and solar tracking programme that sits within the main IES<VE> suite.

Architectural drawings and SketchUp model were used to construct the 3D model, and geographical data was used to determine the change in elevation between the property and the top of the garden. From the topographical map used (Fig. 3-2) it was established that the road level, which is at the same level as the top of the garden, is at an elevation of approximately 40 meters. Fig. 3-2, which shows the 35 meter elevation line, suggests that these measurements are reasonable.

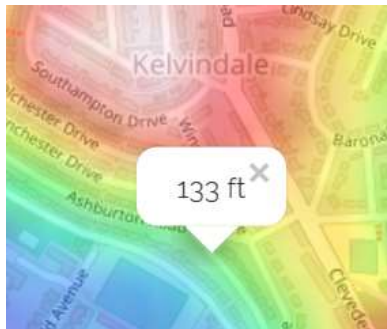


Fig. 3-1: Topographic map showing elevation at top of garden.



Fig. 3-2: Location map showing 35m elevation line.

The BRE BR209 document recommends that 21 March (Spring equinox) be used for the assessment, since on this day shadow plots are of average length. The analysis will consider the impact on sunlight / shadow at 9am, 12pm and 3pm as per the planning response. This procedure will be replicated within IES<VE>. In the results section, a series of images will be included showing the shadow cast over the neighbouring gardens at each of these times.

Furthermore, an analysis of the number of sunlight hours available across each of the neighbouring gardens will be assessed in accordance with the BR 209 Section 3.3.17.

The document recommends that at least half of a garden receive at least 2 hours of sunlight on 21 March. If, as a result of a new development, this requirement is not met, and the area that receives 2 hours of sun on 21 March is less than 80% of the former value, the loss of sunlight is likely to be noticeable.

To conduct this part of the analysis, the garden spaces of the adjacent properties (22 and 26 Weymouth Drive) were divided into 1m² sections (Fig. 3.3), and the probable sunlight hours available to each section was calculated within IES<VE>. The amount of sunlight hours available across each garden space based on the existing building, previous proposal and current proposal was measured.

The results for the ground level and terraced portions of the gardens have been reported separately, since it is assumed that the ground floor areas will be the most affected. The different areas have been outlined in Fig. 3-4.

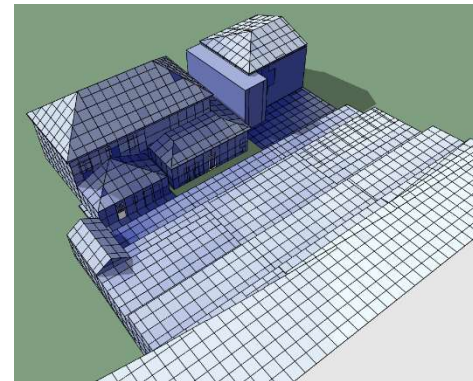


Fig. 3-3: Gradient map of sun exposure based on existing building

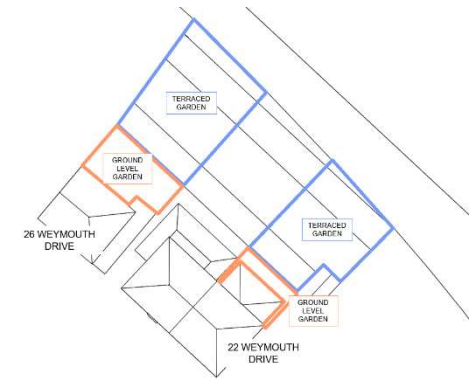
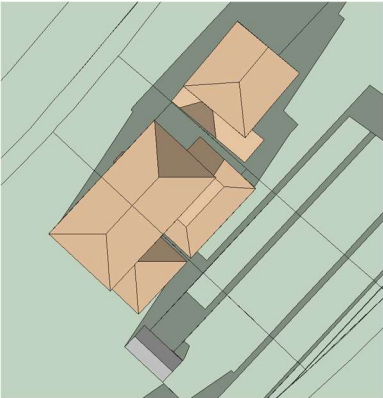


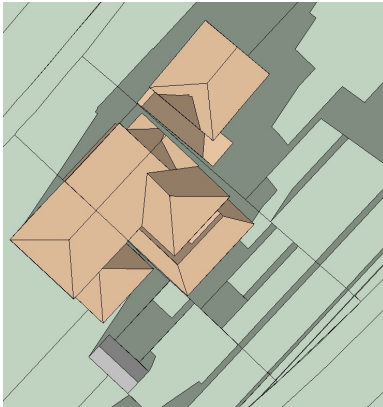
Fig. 3-4: Garden areas of 22 & 26 Weymouth Drive included in analysis.

4.0 | RESULTS

EXISTING BUILDING



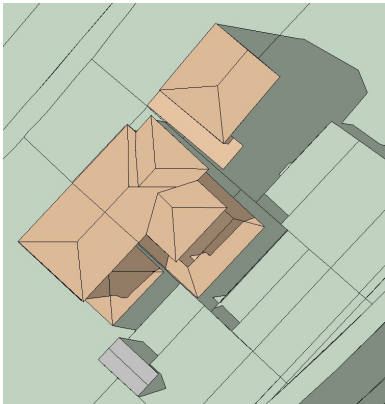
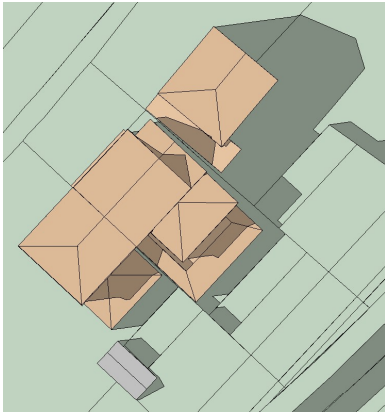
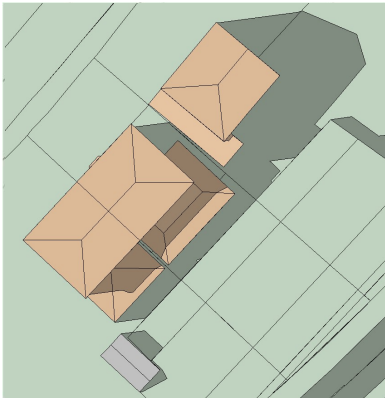
PREVIOUS PROPOSAL



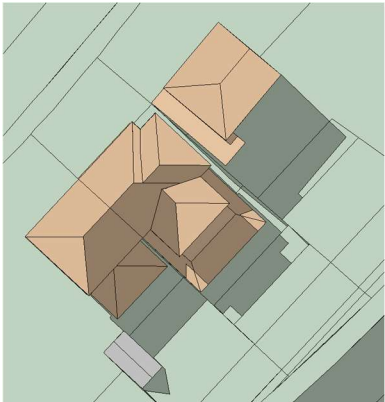
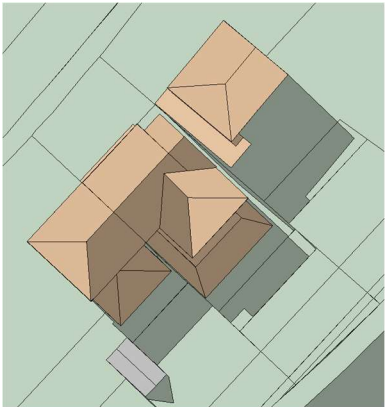
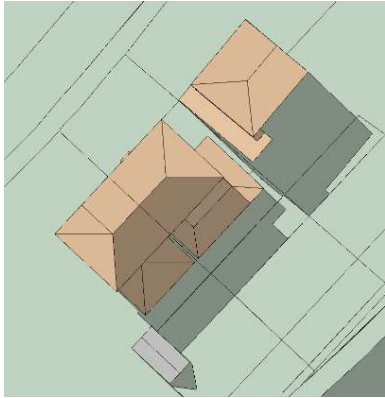
CURRENT PROPOSAL



12pm, 21st March



3pm, 21st March



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The following table summarises the results of the 21st March assessment:

Model	Percentage of garden area that receives ≥2 hours of sunlight on 21 st March				BR 209 Compliant?
	22 Weymouth Drive		26 Weymouth Drive		
	Terraced	Ground Level	Terraced	Ground Level	
Existing Building	100%	63%	100%	93%	-
Previous Proposal	100%	63%	100%	82%	Yes
Current Proposal	100%	63%	100%	88%	Yes

The results show that the proposed extension has no impact on the terraced area of either garden.

The proposed extension also has no additional impact on the ground level garden area of 22 Weymouth Drive, in comparison to the existing building. In the case of both extension proposals, more than half of the garden at 22 and 26 Weymouth Drive receives at least 2 hours of sunlight on the 21st of March.

The analysis does reveal a difference in the amount of sunlight hours experienced across the ground level garden at 26 Weymouth Drive.

The results of the 'previous proposal' reveal that there is a 12% decrease in the area of this ground floor garden that receives ≥2 hours of sun on the 21st of March when compared against the existing property.

When the 'current proposal' is simulated the results reveal that the percentage of garden that does not meet the criteria reduces to 5%.

Based on these results, and according to BR 209, the loss of sunlight to the gardens of 22 and 26 Weymouth drive is unlikely to be noticeable as a result of the 'previous proposal' and the 'current proposal'.

5.0 | CONCLUSION

This report addresses concerns raised that the proposed extension to the property at 24 Weymouth Drive may have a detrimental impact on the provision of sunlight to the neighbouring gardens at 22 and 24 Weymouth Drive.

In accordance with BR 209, a sunlight analysis was conducted, and the level of sunlight available to the neighbouring gardens was calculated. This analysis considers both the previous and current extension proposals in comparison with the existing building.

There was no measured impact on the garden of 22 Weymouth Drive from either proposal.

When the 'previous proposal' is modelled, the area of garden at 24 Weymouth Drive that receives ≥ 2 hours of sunlight on the 21st March is only predicted to reduce by a maximum of 12%, which is within the limits of BR 209.

When the 'current proposal' is modelled that area reduces to 5%, demonstrating an improvement on the 'previous proposal'

Therefore both proposed extensions comply with best practice industry guidance and analysis demonstrates that the loss of sunlight to the gardens of 22 and 26 Weymouth drive is unlikely to be noticeable if either of the proposed extensions are constructed.