REPORT

19 The Burrells, Shoreham

Daylight, Sunlight & Overshadowing Report

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Revision 2

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1.0 Introduction

Delta Green has been instructed to assess the impact to daylight and direct sunlight levels that the proposed new property at 19 The Burrells, Shoreham will have on the residential properties to the North of the site. The proposed development involves the demolition of the existing converted bungalow and construction of a new two storey house. As the site lies directly due South of the terrace of residential properties along Harbour Way there is a concern that these may be overshadowed to some extent.

A Daylight, Sunlight and Overshadowing assessment has been undertaken for submission to the local authority. The purpose of this assessment is to demonstrate that the daylight and direct sunlight levels to the surrounding properties and their gardens will not be significantly affected by the proposed development if constructed. This report therefore assesses the potential impact upon the following two properties, which are most likely to be affected:

- No 132 Harbour Way
- No 21 The Burrells

The daylight and sunlight assessment has been based upon the BRE Guidance document "Site Layout Planning for Daylight and Sunlight, a Guide to Good Practice". Within the introduction the guidance states that '*the guide is intended for building designers and their clients, consultants and planning officials. The advice given here is not mandatory and should not be seen as an instrument of planning policy…although it gives numerical guidelines, these should be interpreted flexibly*'.

Within the BRE guidance it is recommended that only the impact to living space windows should be considered; the impact to non-living space windows such as halls, bathrooms and cupboards need not be assessed. However, based upon the information provided it appears that all windows to the rear of the above properties serve living spaces, and as such the impact on all windows facing the site has been assessed.

1.1 3D Models

A 3D model of the existing property, proposed property and surrounding properties has been constructed, see Figure 1.1 and 1.2. The model of the existing and proposed properties has been constructed based upon the following drawings provided by Liam Russell Architects:

- 1609-PA-001 Existing Location & Block Plan & Ground Floor
- 1609-PA-002 Existing Location & Block Plan & First Floor & Roof Plan
- 1609-PA-003 Existing Elevations
- 1609-PA-004 Existing Elevations
- 1609-PA-010 Proposed Location & Block Plan & Ground Floor & First Floor Plan
- 1609-PA-011 Proposed Location & Block Plan & Roof Plan

- 1609-PA-012 Proposed Elevations
- 1609-PA-013 Proposed Elevations

The model of the adjacent residential properties that are to be assessed has been constructed based on survey drawings provided by Liam Russell Architects.

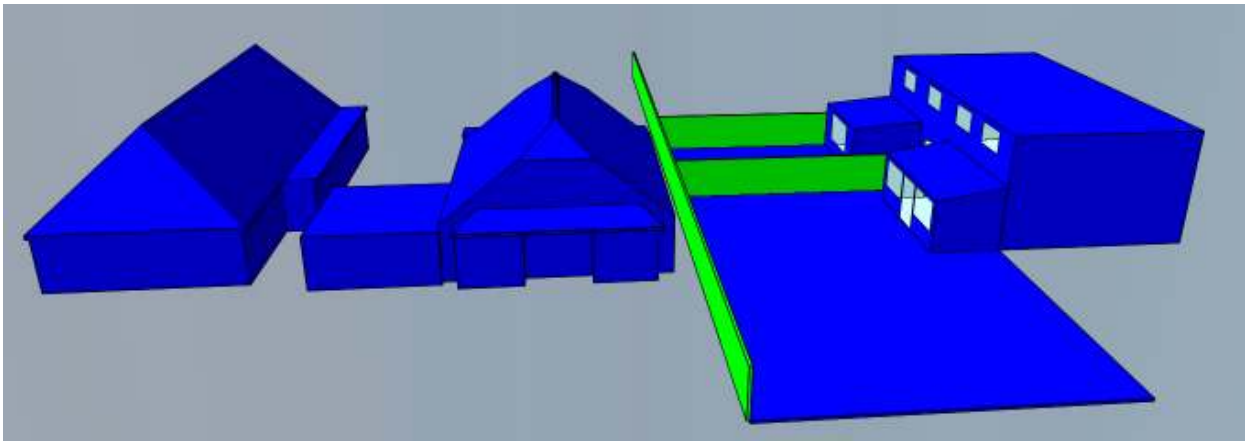


Figure 1.1 Axonometric view of existing site from the East

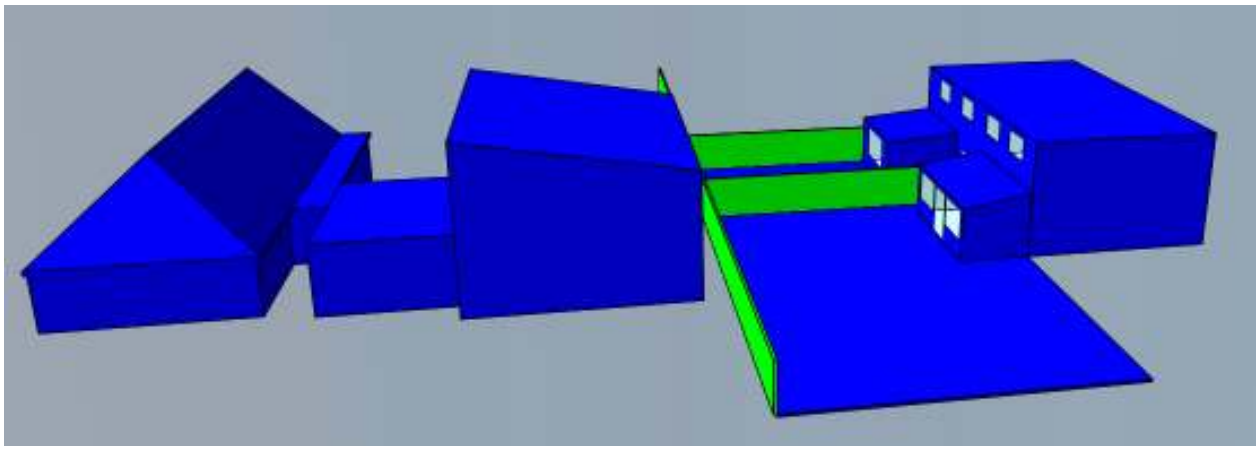


Figure 1.2 Axonometric views of proposed site from the East

2.0 VSC Daylight Assessment

2.1 Assessment Criteria

The amount of skylight that reaches the windows of potentially affected dwellings is assessed by determining the Vertical Sky Component (VSC). The vertical sky component is the ratio of direct sky light that reaches a vertical plane (wall or window) to the amount of sky light that reaches the horizontal plane (the ground). This ratio is expressed as a percentage. The maximum VSC that could be achieved for a completely unobstructed vertical window/wall is almost 40%.

The BRE's Guide to Good Practice Site Layout Planning for Daylight and Sunlight[1] provides the following guide for relating VSC to daylight levels:

VSC ≥ 27% should give reasonable daylight results
VSC between 15% and 27% would need large windows to achieve good daylight
VSC between 5% and 15% would need very large windows to achieve good daylight
VSC less than 5% often impossible to achieve good daylight even if whole wall were glazed.

When assessing the impact of a new development on existing buildings the guidance suggests that if, with a new development, an existing window has a VSC greater than 27% it should still receive sufficient skylight. If the VSC is reduced below 27% and less than 0.8 times its former value, then the occupants are likely to notice the loss of skylight.

2.2 Methodology

The Radiance module within the IES Virtual Environment (VE) software is used to calculate the vertical sky component (VSC). This value is calculated at the centre of any potentially affected windows using a 3D model that is constructed within IES. The model is completed to reflect both the current conditions and the proposals. The VSC is then calculated in each case for each window in order to determine the potential impact of the development to available sunlight. The VSC calculation uses the standard CIE overcast sky.

2.3 Results of VSC and Discussion

The results for the VSC are presented in table 2.1 below (window references are given in Appendix 1). These results demonstrate that all nine of the assessed windows currently receive a VSC exceeding 27%, and only window 4 at 132 Harbour Way has the VSC reduced to below 27% by the proposed property. However, in this case the VSC is reduced to 26.8% and so the level of non-compliance with this criterion is minimal. All of the assessed windows maintain a VSC above 0.8 times the existing VSC value with the proposed property in place, meaning that eight of the nine assessed windows comply with both VSC criteria, and the other window complies with at least one criterion.

Therefore, as there are no windows where the VSC is reduced below 27% and to below 80% of the existing value, the assessment results confirm that daylight amenity to these windows will not be adversely affected by the proposed development.

[1] Site Layout Planning for Daylight and Sunlight, A Guide to Good Practice (BR 209), 2011, Paul Littlefair, BRE, Second Edition.

Building	Point No.	Existing VSC	Guidance met currently?	80% VSC Threshold	Proposed VSC	reduced below 27%?	Reduced beyond 0.8x threshold?
132 Harbour Way	1	38.5	✓	30.8	38.5	No	No
	2	38.6	✓	30.9	38.3	No	No
	3	34.7	✓	27.8	34.0	No	No
	4	27.2	✓	21.8	26.8	Yes	No
21 The Burrells	1	38.5	✓	30.8	38.3	No	No
	2	38.7	✓	30.9	38.5	No	No
	3	34.6	✓	27.7	33.4	No	No
	4	34.0	✓	27.2	32.6	No	No
	5	35.6	✓	28.5	33.8	No	No

Table 2.1 Results of VSC study

3.0 Annual Probable Sunlight Hours (APSH) Assessment

3.1 Assessment Criteria

The criteria used for assessment of the impact of the proposed development on sunlight levels to existing dwellings is taken from the BRE Guidance for "Site Layout Planning for Daylight and Sunlight, a Guide to Good Practice".

The BRE guidance summarises that a dwelling shall appear reasonably sunlit if the centre of a main living room window can receive 25% of annual probable sunlight hours, including at least 5% of annual probable sunlight hours in winter months between 21st September and 21st March.

When considering the impact of a development on an existing dwelling, the sunlight to the the existing dwelling may be adversely affected if:

- The centre of the main living room window receives less than 25% of annual probable sunlight hours, or less than 5% of annual probable sunlight hours between 21st September and 21st March;
- The centre of the main living room window receives less than 80% of its former sunlight hours during either period, and;
- The centre of the main living room window has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours

3.2 Methodology

The IES VE model constructed to assess the impact on VSC is used again to assess the impact the proposed development will have on APSH to each affected window. The model is opened within the Sun Cast module of IES, and a calculation is run to determine the APSH that each of the potentially affected windows will receive.

As the results are provided for each hour of daylight on a chosen day in each month, the results are averaged to provide a single APSH and winter PSH value for each window.

3.3 Results of APSH and Discussion

The annual probable sunlight hours have been determined for each potentially affected window and the results are shown in table 3.1 below. The criteria to evaluate if the sunlight levels will be adversely affected are:

1. Less than 25% APSH or less than 5% APSH in winter months AND

2. Either annual or winter sunlight hours are less than 0.8 times former values AND

3. Reduction in annual sunlight is greater than 4% APSH

The results of the APSH analysis clearly demonstrate that the level of sunlight received at each window will not be significantly affected, either annually or over the winter period. In every case all three of the sunlight assessment criteria have been met, which would strongly indicate that there will be no noticeable impact upon the sunlight levels at these windows. At all windows the APSH and WPSH available remain high with the proposed development in place.

The sunlight analysis therefore confirms that none of the assessed windows will be adversely affected in terms of direct sunlight as a result of the development proposals.

Building	Window No.	Existing APSH %		80% Threshold		Proposed APSH %		BRE Guidance met?
		Annual	Winter	Annual	Winter	Annual	Winter	
132 Harbour Way	1	79.86	38.19	63.89	30.56	79.86	38.19	✓
	2	79.86	38.19	63.89	30.56	79.86	38.19	✓
	3	67.91	27.49	54.33	21.99	66.25	25.83	✓
	4	45.05	17.11	36.04	13.68	43.93	15.99	✓
21 The Burrells	1	79.86	38.19	63.89	30.56	79.86	38.19	✓
	2	79.86	38.19	63.89	30.56	79.86	38.19	✓
	3	72.33	31.52	57.87	25.22	68.53	27.72	✓
	4	70.50	29.69	56.40	23.75	67.06	26.25	✓
	5	75.15	33.51	60.12	26.81	71.44	29.80	✓

Table 3.1 Results of APSH study

Key: ✓= Criteria 1, 2 & 3 are exceeded, or criteria 2 & 3 are exceeded where 1 is not currently met

✓= At least two of criteria 1, 2 & 3 are exceeded

✖= At least 2 of criteria 1, 2 & 3 are infringed, or 2 and 3 where 1 is not currently met

4.0 Overshadowing Assessment

4.1 Assessment Criteria

The impact of the proposed development on the neighbouring gardens of 132 Harbour Road and 21 The Burrells is assessed against guidance provided within the BRE Guidance for "Site Layout Planning for Daylight and Sunlight, a Guide to Good Practice" 2011. The guidance states that the sunlight to a garden will be adversely affected if both of the following criteria are infringed upon:

1. The area of garden that can receive 2 or more hours of direct sunlight on 21st March is reduced to below 50% of the total area.

2. The total area of the garden that can receive 2 or more hours of direct sunlight on 21st March is reduced by 20% or more of the existing value because of the proposed development.

Therefore, where less than 50% of the garden is found to receive direct sunlight for at least 2 hours as a result of the development *and* the total area that still receives direct sunlight is less than 80% of the former value the garden is considered to be overshadowed.

4.2 Methodology

The IES VE model constructed to assess the impact on VSC is used again to assess the impact the proposed development will have on the neighbouring gardens. The model is opened within the Sun Cast module of IES, and a calculation run to determine the area of the garden that will receive direct sunlight for each day light hour on 21st March. This calculation is completed for both the existing and proposed scenarios.

For the first criterion the number of hours where at least 50% of the assessed garden receives direct sunlight is compared both before and after construction. If the number of hours is reduced below two as a result of the proposed development being constructed the criterion is not met.

For the second criterion, as the results are provided for each hour of daylight on 21st March the results are averaged to provide a single figure for average area of each garden that receives direct sunlight throughout the whole day. This figure is then multiplied by 0.8 and if the results with the proposed development in place do not exceed this value the second criterion is not met.

The boundary of each garden has been taken from the location plan drawing provided by Liam Russell Architects. However, as the garden of 21 The Burrells is a 'wrap around' garden only the area of the garden to the rear of the property, i.e. South of the South facing façade, has been assessed. Figure 4.1 below shows the area of each garden that has been assessed. Boundary fences have been included within the model.

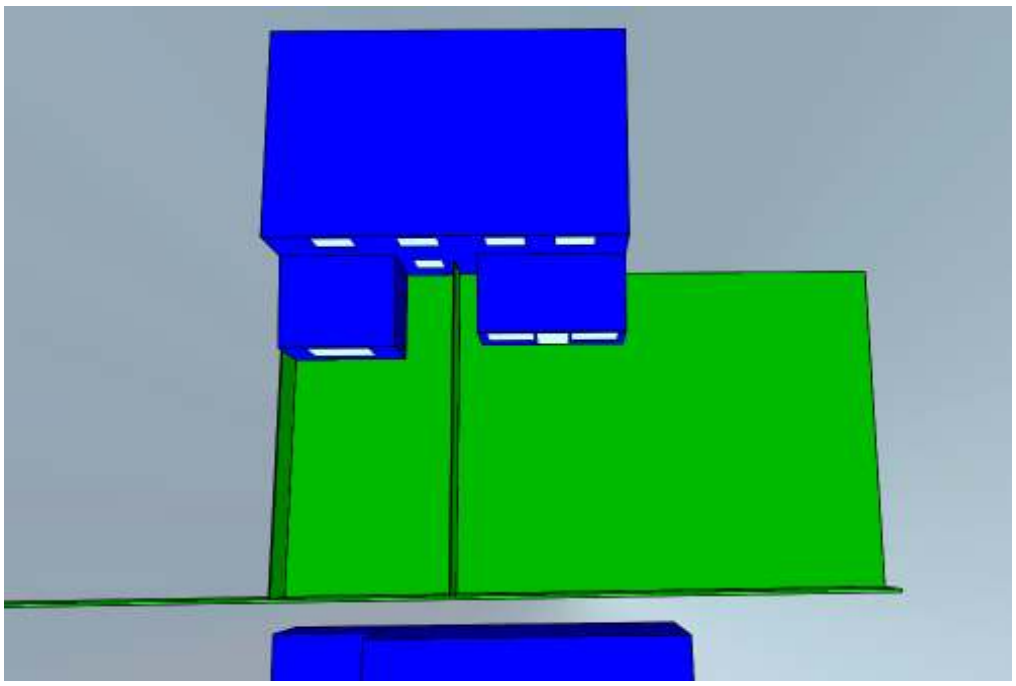


Figure 4.1 Plan View of Garden Areas Assessed

4.3 Results of Overshadowing Assessment and Discussion

The results from the IES Sun Cast analysis are shown in table 4.2 below. The results demonstrate that the gardens directly to the North of 19 The Burrells will not be overshadowed by the proposed property.

The average area of each of the gardens that receives direct sunlight on 21st March is not reduced to below 80% of the existing value in either case. Furthermore, the results for criterion 1 show that the number of hours for which 50% or more of each garden receives direct sunlight is above 2 in both cases. This demonstrates that criterion 1 is not infringed.

Garden	No. hours >50% of garden receives direct sunlight		Av. Area receiving direct sunlight (sqm)			BRE Guidance met?
	Existing	Proposed	Existing	80% Threshold	Proposed	
132 Harbour Way	4	3	23.23	18.58	18.62	✓
21 The Burrells	10	8	126.35	101.08	109.78	✓

Table 4.2 Results of overshadowing study

Key: ✓= Criteria 1 & 2 are exceeded

✓= At least one of criteria 1 & 2 are exceeded

✖= Both criteria 1 & 2 are infringed

5.0 Conclusion

5.1 VSC Assessment

The VSC assessment results demonstrate that new property will not have a significant impact on the VSC for either of the assessed properties. None of the windows assessed have a VSC that is reduced to below 80% of the existing VSC value, and to eight of the nine windows the proposed VSC remains above 27% with the proposed development in place. There is one example where the VSC is reduced to below 27%, however the reduction is to just 26.8%, which is a negligible margin.

VSC levels at these windows therefore continue to meet guidance for VSC levels with the proposed property in place, and so daylight levels to these windows are not considered not to be adversely affected.

5.2 APSH Assessment

The Annual Probable Sunlight Hours (APSH) assessment results demonstrate that the proposed property will not have a noticeable negative impact on the APSH to windows on the adjacent properties. In all nine cases the APSH and WPSH to the windows remain above the threshold to achieve all three of the sunlight criteria thresholds.

The sunlight analysis therefore confirms that none of the assessed windows will be adversely affected in terms of direct sunlight as a result of the development proposals.

5.3 Overshadowing Assessment

The results of the overshadowing assessment indicate that the amount of sunlight that reaches the gardens will not be adversley affected as a result of the proposed development being constructed. The total area of the gardens receiving at least 2 hours of sunlight does not fall below 80% of the existing levels, with the number of hours that at least 50% of the garden receives direct sunlight remaining above 2 hours.

6.0 Appendix 1 – Window References

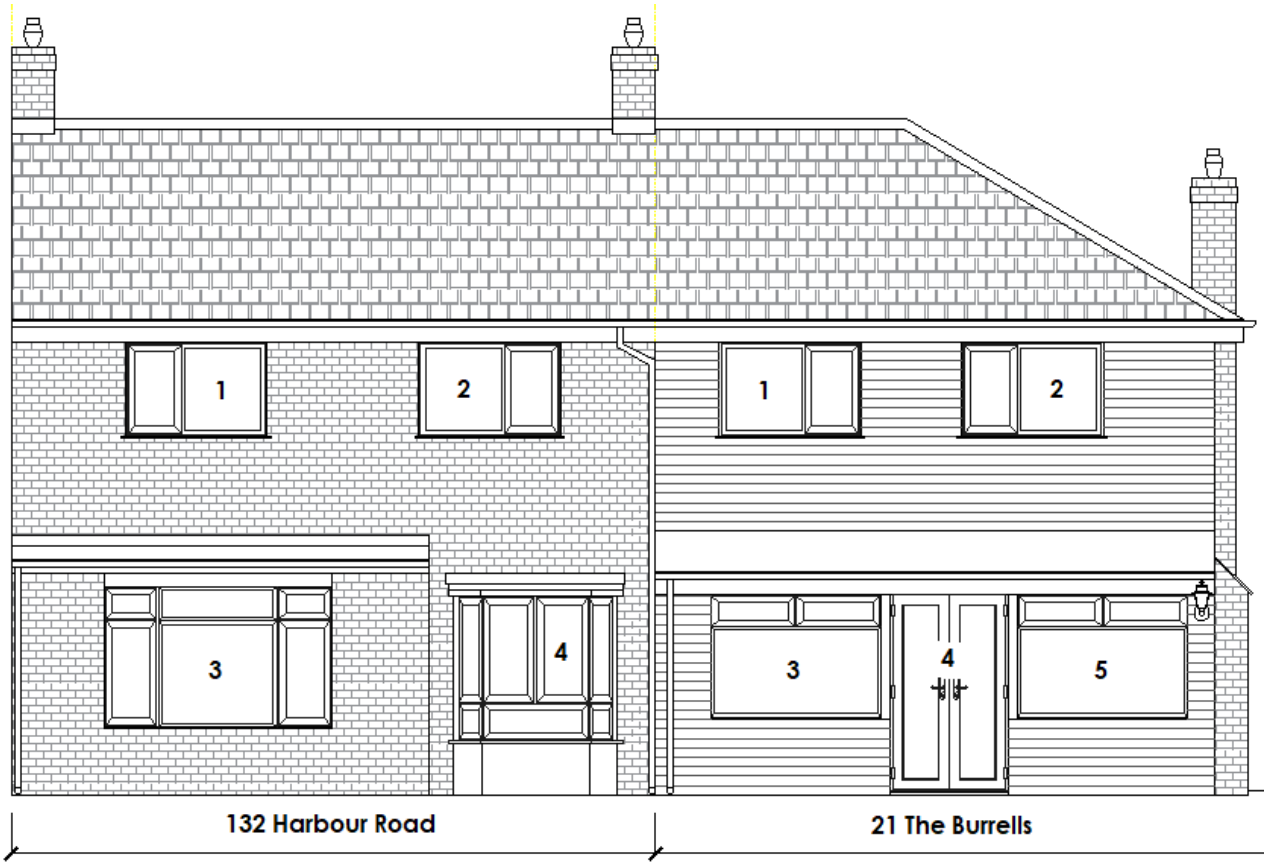


Figure 6.1. Window numbering for analysis