DAYLIGHT, SUNLIGHT & OVERSHADOWING

60 KEYMER ROAD

HASSOCKS

VERSION 04

JANUARY 2025

SCIENCE BEHIND THE DESIGN

Company Registration No: 10354408

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PROJECT NAME: 60 Keymer Road Hassocks

PROJECT REFERENCE: X216

Version	Date	Description of changes
01	24.10.2023	First issue
02	26.10.2023	Updated to include comments
03	08.11.2023	Reduced screen height by 150mm
04	30.01.2025	Revised scheme

CONTENTS

1 INTRODUCTION

XDA Consulting Ltd have been appointed to identify if there is any impact on the daylight, sunlight and overshadowing to the adjacent properties because of the proposed development at 60 Keymer Road in Hassocks. The design proposals are for the replacement of the existing commercial motor vehicle premises and replaced with a 4-storey mixed use development comprising commercial spaces at ground floor with residential apartments above.

This daylight assessment shall identify if there is any impact on the windows or gardens of:

- 58 Keymer Road
- 1 Dale Terrace
- 1 John Saxby Place

The daylight study has been undertaken by Dr Dianne Bowles PhD MSc BSc (Hons) using dynamic modelling software IES Virtual Environment 2023.

2 ASSESSMENT CRITERIA

The criteria used for assessment of the impact of a proposed development on daylight, sunlight and overshadowing to existing dwellings is taken from the BRE Guidance document "BR 209: Site Layout Planning for Daylight and Sunlight, a Guide to Good Practice, 2022".

2.1 VERTICAL SKY COMPONENT

The amount of skylight that reaches the windows 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 window/wall is almost 40%.

When assessing the impact of a new development on existing buildings the BRE 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 ANNUAL PROBABLE SUNLIGHT HOURS

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 existing dwelling may be adversely affected if:

- receives less than 25% of annual probable sunlight hours and less than 0.80 times its former annual value; or less than 5% of annual probable sunlight hours between 21 September and 21 March and less than 0.80 times its former value during that period;

- and also has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

2.3 OVERSHADOWING

The BRE 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 as a result 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.

3 METHODOLOGY

The Radiance module in the IES Virtual Environment (VE) software is used to calculate the vertical sky component (VSC). The VSC calculation uses the standard CIE overcast sky.

The SunCast module in IES VE is used to produce a solar exposure calculation to determine the number of hours each day a window receives sunlight from the sky. These results are used to calculate the Annual Probable Sunlight Hours. This module is also used to determine the area of overshadowing to each of the gardens.

4 3D MODELS

A 3D model of the existing property, the proposed development and neighbouring properties has been constructed based on the following drawings from Bowen & McLachlan Ltd:

- A001 Location Plan
- A002 Existing Survey
- A003 Proposed Site Plan
- A010 Floor Plan Level 00 Rev 02
- A011 Floor Plan Level 01 Rev 02
- A012 Floor Plan Level 02 Rev 02
- A013 Floor Plan Level 03 Rev 02
- A014 Roof Plan Level 04 Rev 02
- A020 Site Elevations Rev 02
- A020 Site Sections Rev 02

The following drawings have been taken from the planning portal to assist with the window locations on the adjacent properties:

- 1 Dale Terrace: Drawing DC19/010 East Elevation As Proposed Dated July 2019

- 1 John Saxby Place: Drawing YO229-2004 North & South Elevation Rev B dated Dec 2016
- 58 Keymer Road: Drawing 964/20/SPL/04 Elevation Existing & Proposed dated 10.20

Visuals of the 3D model are presented in Figure 4.1 to Figure 4.5 inclusive with model orientation illustrated in Figure 4.6. The following abbreviations have been applied to the buildings:

- 1 Dale Terrace = 1 DT
- 1 John Saxby Place = 1 JSP
- 58 Keymer Road = 58 KR

Note: the model has been built as a 3D mass with only the elements that impact the daylight assessment included, hence the atrium is not included as only the outer surfaces are necessary.

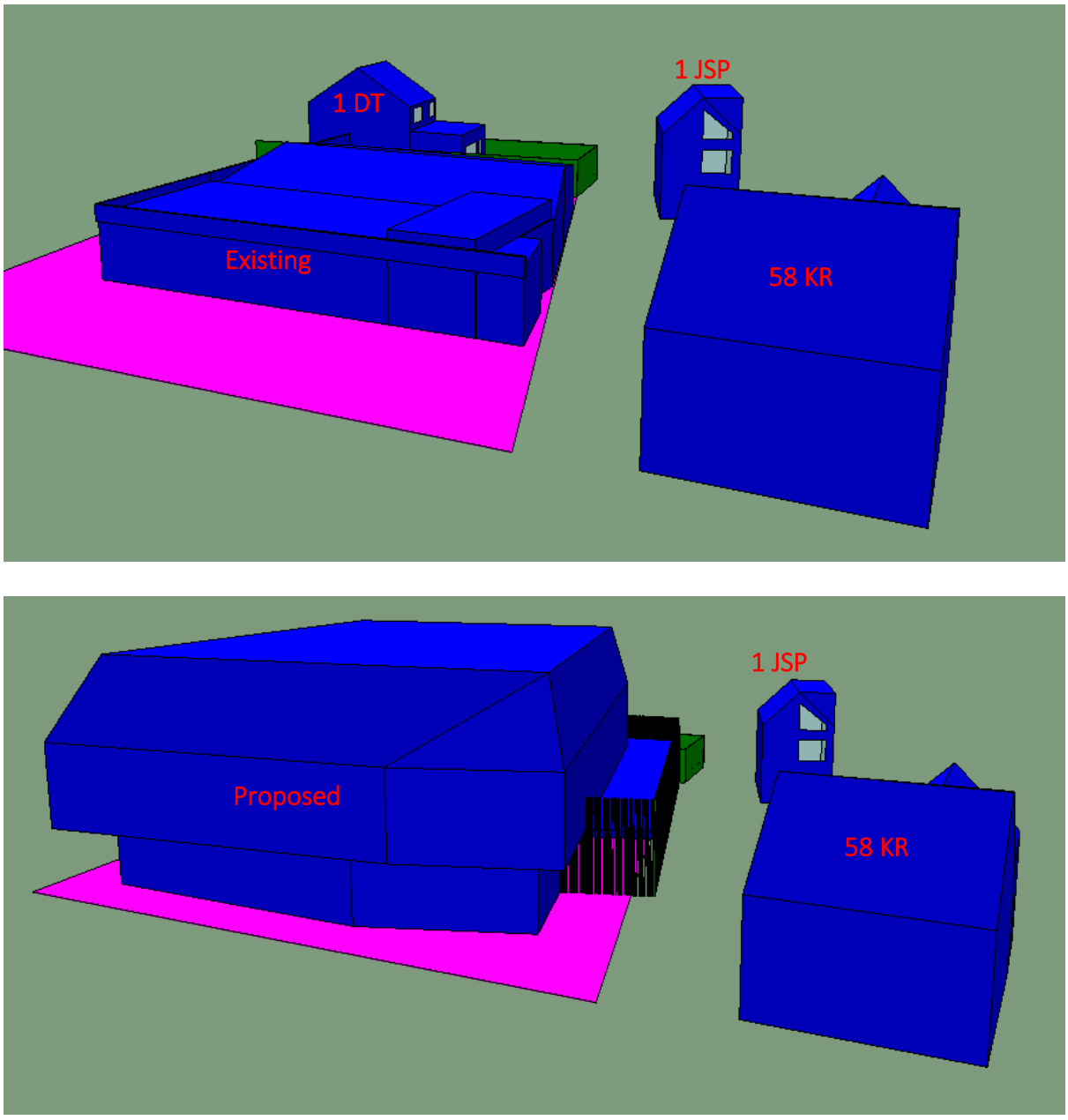


Figure 4.1 Existing & proposed development with adjacent properties – view from north

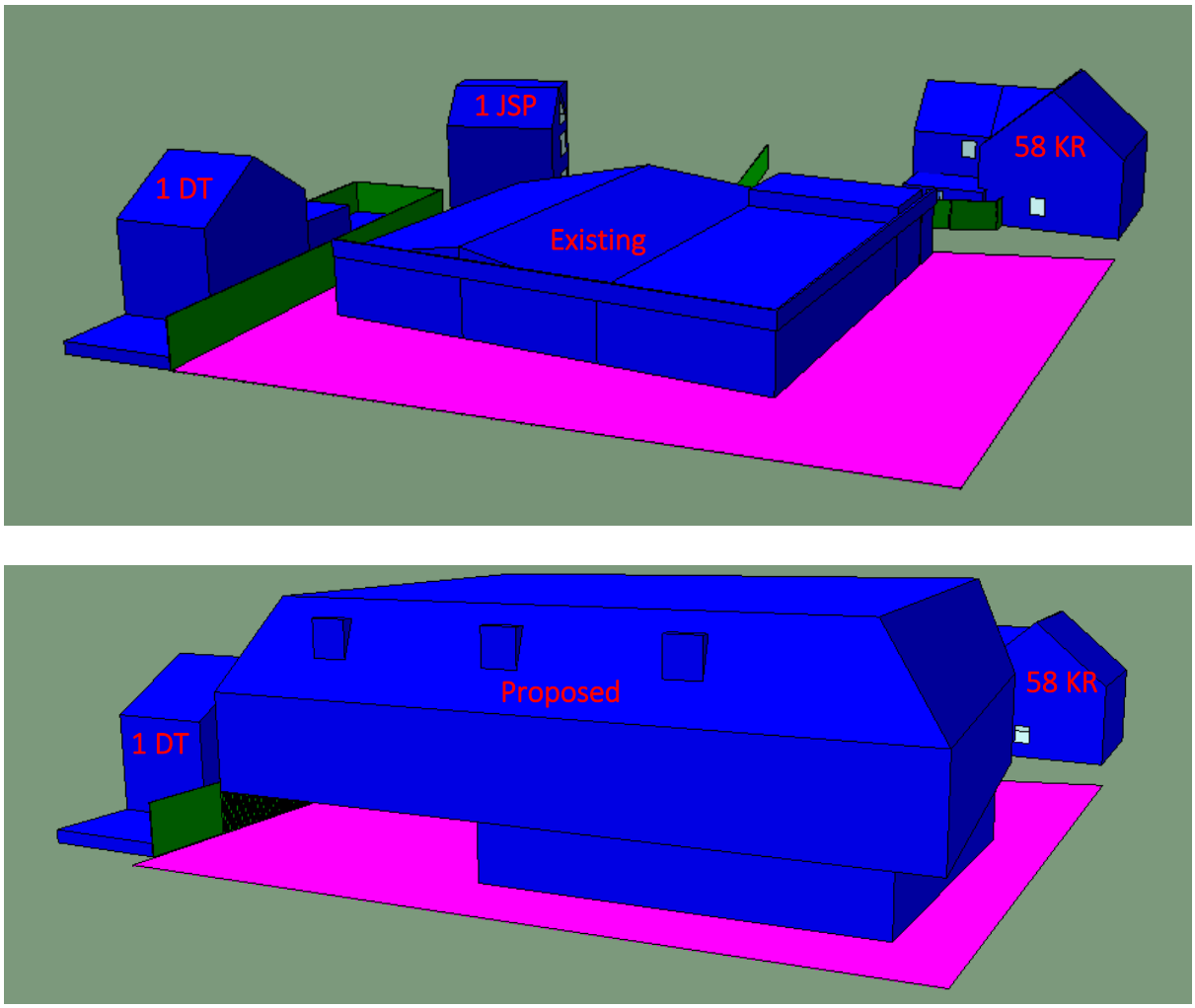


Figure 4.2 Existing & proposed development with adjacent properties – view from east

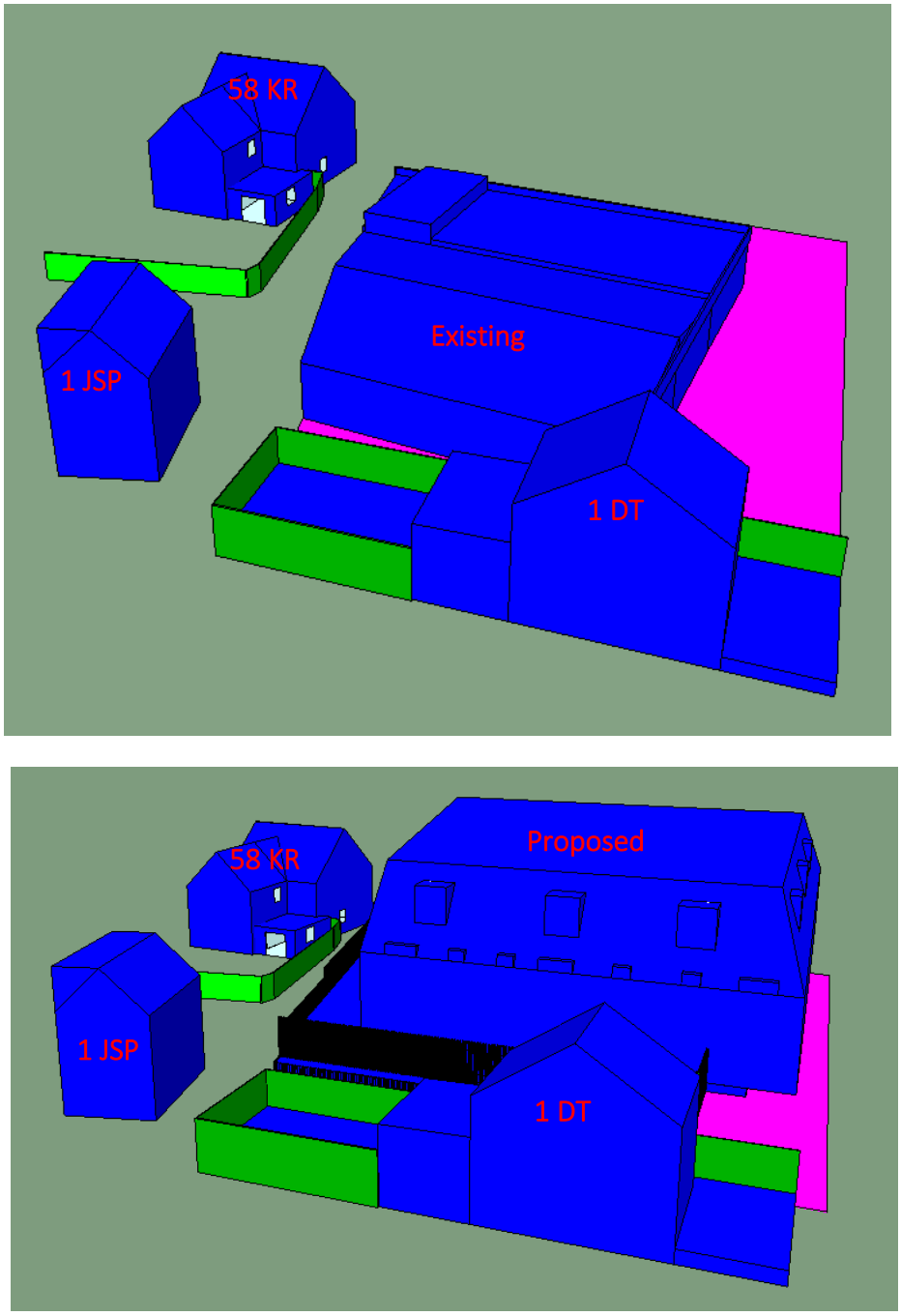


Figure 4.3 Existing & proposed development with adjacent properties – view from south

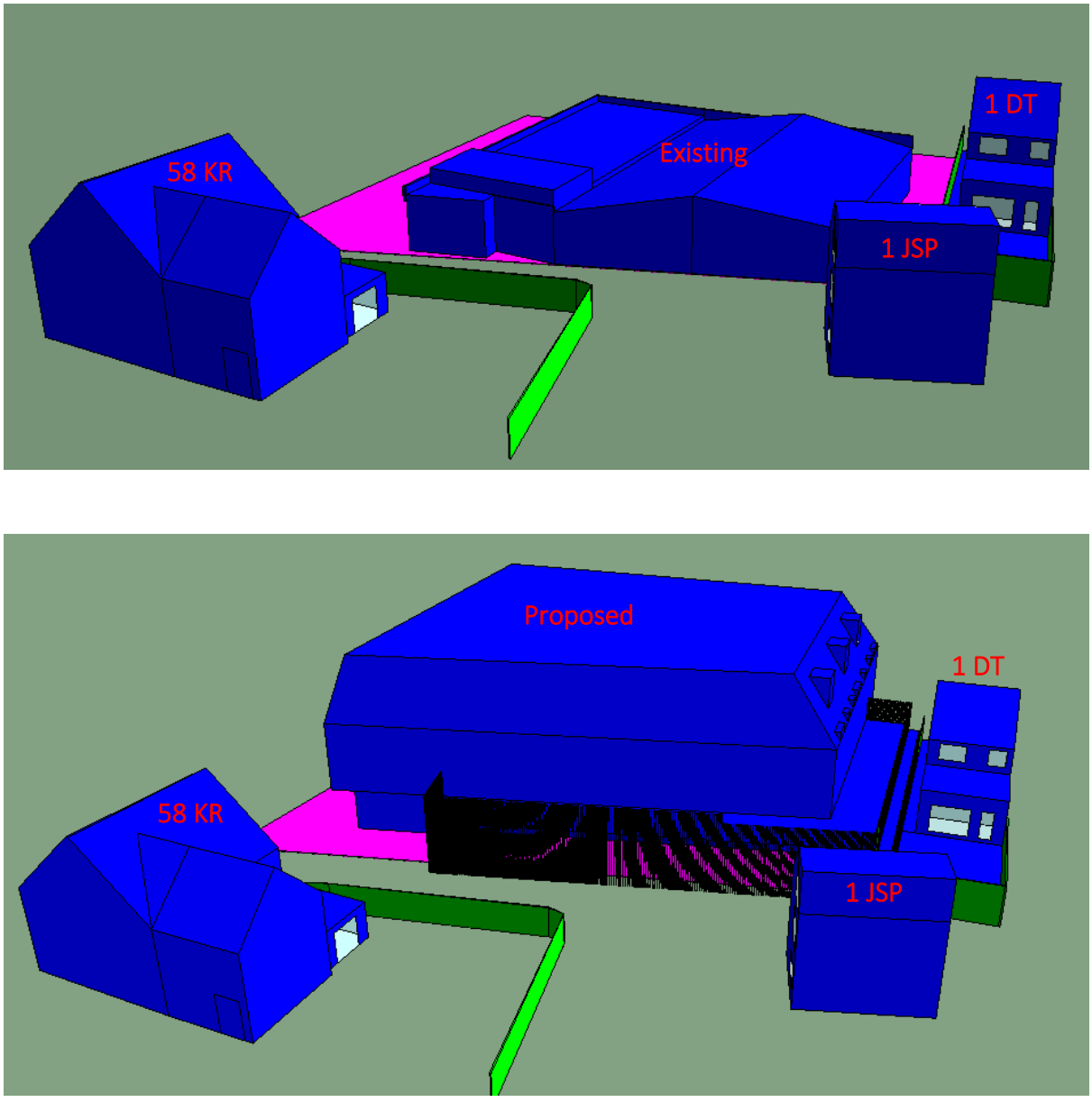


Figure 4.4 Existing & proposed development with adjacent properties – view from west

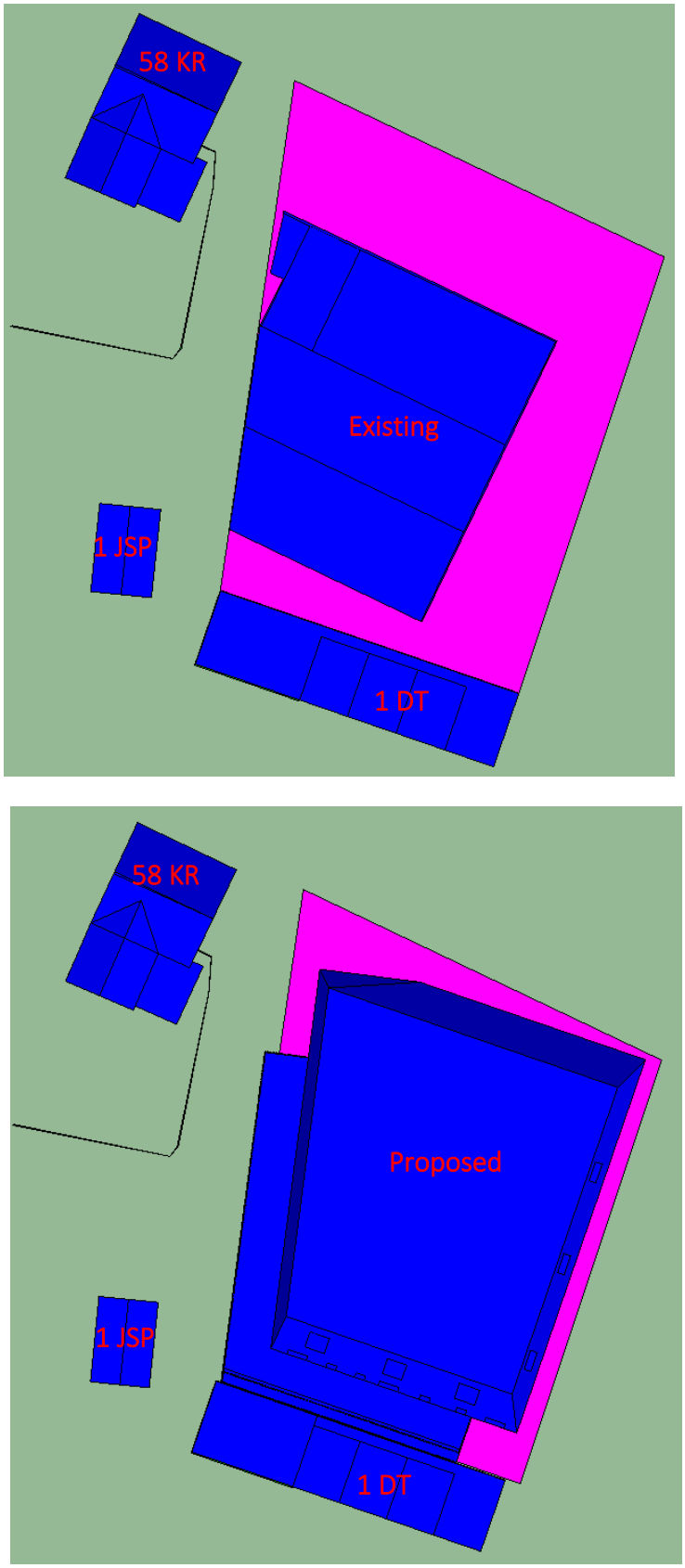


Figure 4.5 Existing & proposed development with adjacent properties – view from above

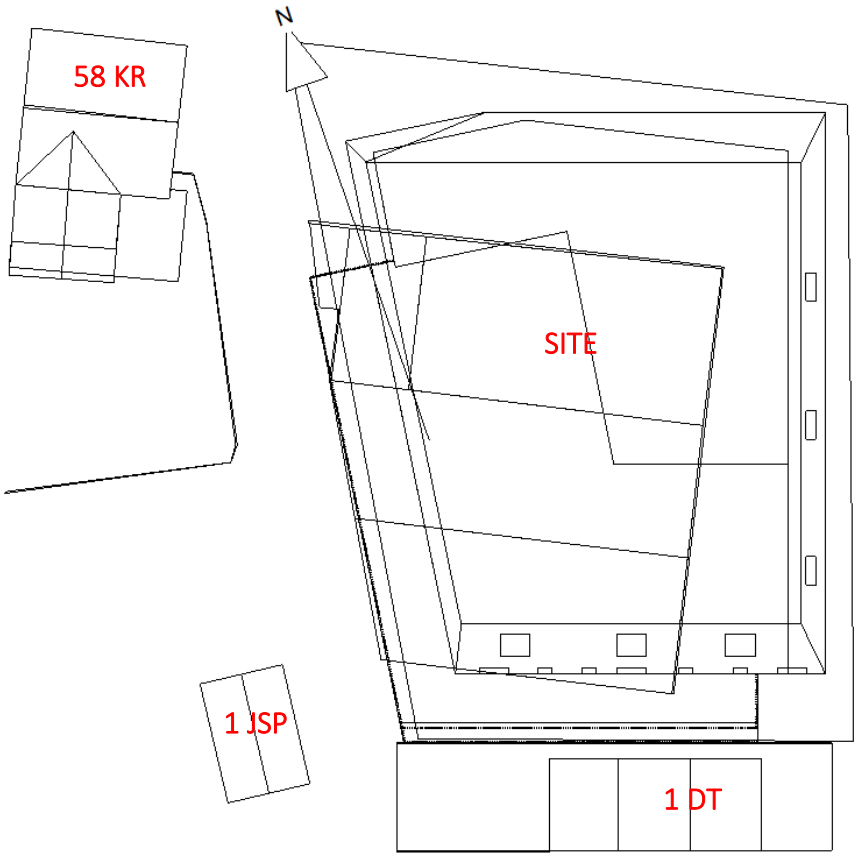


Figure 4.6 Site plan showing orientation of building model – note existing & proposed are overlaid

5 RESULTS & DISCUSSION

The section reviews the impact of the proposed development on the adjacent windows and gardens.

5.1 VERTICAL SKY COMPONENT

The BRE guidance states 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.

The VSC results are presented in Table 5.1 with the window references given in Appendix 1.

Dwelling	Window No.	Existing VSC	Guidance met currently? (≥27%)	80% VSC Threshold	Proposed VSC	reduced below 27%?	Reduced beyond threshold?	BRE compliant
1 Dale Terrace	1	33.4	✓	26.7	29.0	No	No	✓
1 Dale Terrace	2	30.5	✓	24.4	27.8	No	No	✓
1 Dale Terrace	3	38.4	✓	30.7	34.2	No	No	✓
1 Dale Terrace	4	38.5	✓	30.8	36.3	No	No	✓
1 John Saxby Place	1	36.7	✓	29.4	33.4	No	No	✓
1 John Saxby Place	2	38.7	✓	31.0	35.2	No	No	✓
1 John Saxby Place	3	39.5	✓	31.6	36.7	No	No	✓
58 Keymer Road	1	36.9	✓	29.5	35.1	No	No	✓
58 Keymer Road	2	32.4	✓	25.9	21.6	Yes	Yes	✘
58 Keymer Road	3	37.5	✓	30.0	28.5	No	Yes	✓

Table 5.1 Daylight results (VSC) for windows adjacent to the proposed development site

1 Dale Terrace

The VSC results demonstrate the windows shall not be noticeably impacted by the proposed development as they meet the BRE impact criteria.

1 John Saxby Place

There shall be no impact to the VSC received by the windows on the front elevation of John Saxby Place.

58 Keymer Road

Only the ground floor windows have been assessed as it is understood the first floor window facing the development serves a bathroom as the window is frosted.

Window 2 facing the development shall be noticeably impacted. This window serves a sitting room which is also served by large patio doors on the south elevation as shown on the planning drawing presented in Appendix 2. Therefore, this impact will be less significant to the daylight within the room. Because the room is served by two windows, an area weighted VSC can be

determined and the VSC impact to the room considered. As the patio door is estimated to be 4m^2 and the side window 1.4m^2 the overall VSC is calculated as follows:

- Existing: [(4 x 36.9) + (1.4 x 32.4)] ÷ 5.4 = 35.7% VSC
- Proposed: [(4 x 35.1) + (1.4 x 21.6)] ÷ 5.4 = 31.6% VSC

As the area weighted VSC will remain above 27% for the sitting room, there is negligible impact on this room by the proposed development.

5.2 ANNUAL PROBABLE SUNLIGHT HOURS

The BRE guidance outlines that the sunlight to an existing dwelling may be adversely affected if the centre of the window:

- receives less than 25% of annual probable sunlight hours and less than 0.80 times its former annual value; or less than 5% of annual probable sunlight hours between 21 September and 21 March and less than 0.80 times its former value during that period;
- and also has a reduction in sunlight received over the whole year greater than 4% of annual probable sunlight hours.

BRE guidance suggests that all main living rooms of dwellings, and conservatories, should be checked if they have a window facing within 90° of due south.

The large patio doors of 1 Dale Terrace and 58 Keymer Road have been analysed. 1 John Saxby Place has the living room windows to the rear of the property. The results are presented in Table 5.2 and demonstrates the sunlight to the windows will not be impacted.

Dwelling	Window No.	Existing APSH %		80% Threshold		Proposed APSH %		BRE Guidance met?
		Annual	Winter	Annual	Winter	Annual	Winter	
1 Dale Terrace	1	19.37	1.53	15.50	1.22	19.37	1.53	✓
58 Keymer Road	1	40.64	8.58	32.51	6.86	37.64	7.74	✓

Table 5.2 Sunlight results for adjacent windows

5.3 OVERSHADOWING

The BRE guidance states that the sunlight to a garden will be adversely affected if both of the following criteria are infringed upon:

- 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.
- 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 as a result of the proposed development.

The results from the IES SunCast analysis, comparing the overshadowing to 1 Dale Terrace for the existing and proposed situation, are shown in Table 5.3. The confirm there will be no

change in the overshadowing to the garden of 1 Dale Terrace, as the development is to the north.

Garden	No. Hours >50% Of Garden Receives Direct Sunlight		Av. Area Receiving Direct Sunlight (Sqm)			BRE Impact Guidance Met?
	Existing	Proposed	Existing	80% Threshold	Proposed	
1 Dale Terrace	2	2	16.68	13.34	16.68	✓

Table 5.3 Overshadowing results of adjacent garden.

6 CONCLUSIONS

This report has assessed the potential impact on daylight, sunlight and overshadowing by the proposed development at 60 Keymer Road in Hassocks.

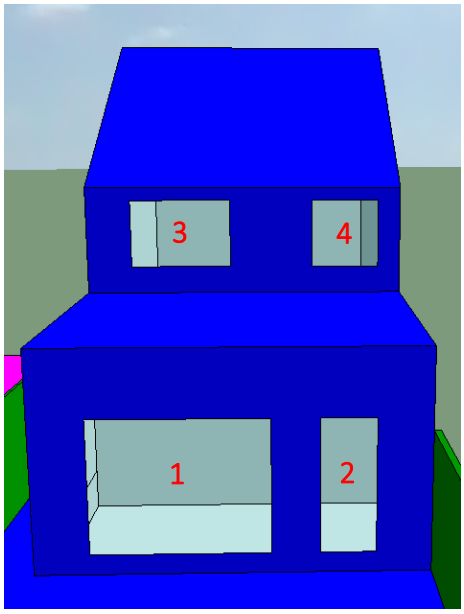
The results discussed in the previous section demonstrate the following:

- 1 Dale Terrace – negligible impact.
- 1 John Saxby Place – negligible impact.
- 58 Keymer Road – negligible impact.

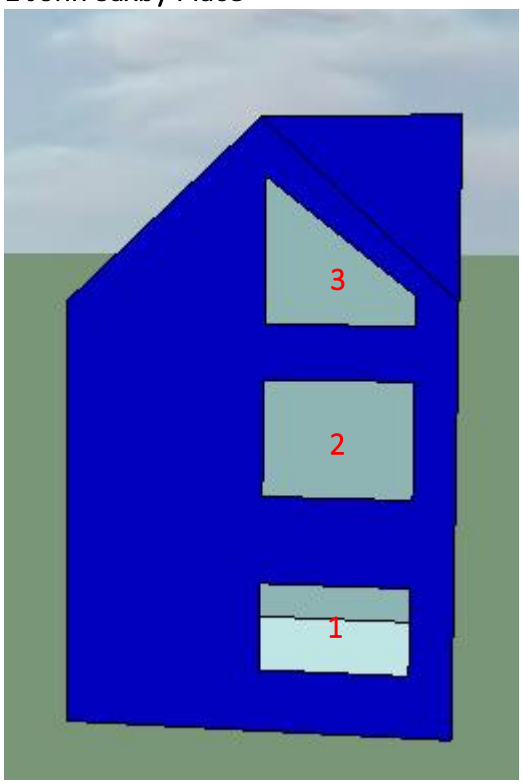
This study has been undertaken following the process outlined in the BRE Guidance document "BR 209: Site Layout Planning for Daylight and Sunlight, a Guide to Good Practice, 2022. The guidance states: *The advice given here is not mandatory and the guide should not be seen as an instrument of planning policy; its aim is to help rather than constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly since natural lighting is only one of many factors in site layout design.*

7 APPENDIX 1: WINDOW REFERENCES

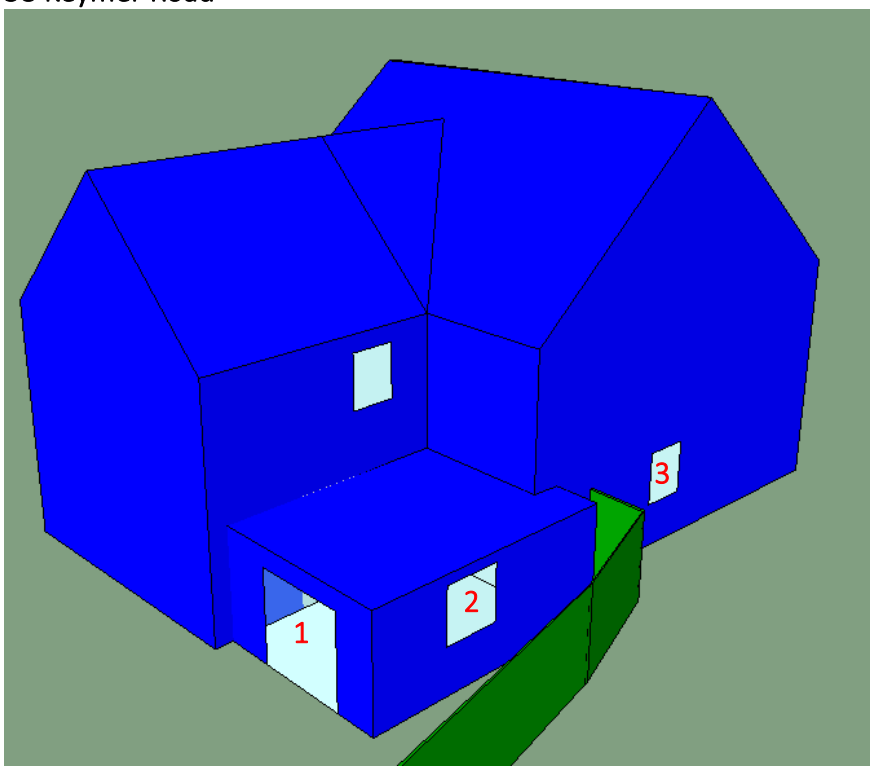
1 Dale Terrace



1 John Saxby Place



58 Keymer Road



8 APPENDIX 2: 58 KEYMER ROAD

Ground Floor