Daylight Analysis and Overshadowing

12 Templeville Drive, Tempelogue, Dublin 6W

19/10/2021

Contents

1. Executive Summary

H3D were engaged to provide a report on the impact of the proposed extension to the rear of 12 Templeville Drive, Dublin 6W. H3D were instructed to carry out the following:

- To create a 3D computer analysis model of the scheme based upon drawings provided by RS Consulting Engineers.
- Carry out an assessment based on the 45-degree rule as set out in BRE BR209.
- Carry out a study to investigate if the Vertical Sky Component (VSC) of the adjacent window in No. 14 reaches 27% or is not less than 0.8 times the existing value.
- Carry out a daylight assessment by creating a general overshadowing study based 4 No. times (10am 12pm, 2pm & 4pm [where applicable]) on 4 No. days (21st of March, June, September & December).
- Prepare a report setting out the analysis and the findings.

Methodology

The assessment of the proposed development was prepared using the methodology's set out in the British Standard: Lighting for Buildings – Part 2: Code for Practice for Daylighting, BRE 209, 'Site Layout Planning for Daylight and Sunlight: A Guide to Good Practice', Second Edition 2011, by P. J. Littlefair and the Design Standards for New Apartments - Guidelines for Planning Authorities (March 2018).

BRE Guide and Advisory Note

The numerical guidelines given in these documents are purely advisory. The BRE Guide states that:

> "The advice given here is not mandatory and the guide should not be 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."
>
> "It is purely advisory and the numerical target values within it may be varied to meet the needs of the development and its location" (Section 1.6, p1)

Overall Conclusion.

From the 45-degree analysis the point 1.5m from the bottom of the door of No. 14 Templeville Dr does not fall within *both* plan and elevation extension lines. The proposed extension passes this BRE guideline.

The VSC analysis was carried out and showed that the adjacent door of No. 14 Templeville Dr receives 0.87 times the existing value thus passing the BRE guideline level (>0.8)

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2. 45 Degree Rule

The effect of the new development on the neighbouring buildings to the north-west and south-east were investigated using the '45° approach' as per 2.2.15-17 of 'Site Layout Planning for Daylight and Sunlight, A guide to Good Practice' by Paul Littlefair, a BRE Guideline Document.

As per the BRE guideline if the centre-point of a window or a point 1.5m high in the centre of door falls within the 45-degree extension line of *both* the plan and elevation it may well cause a significant reduction in the skylight received by the window or door.

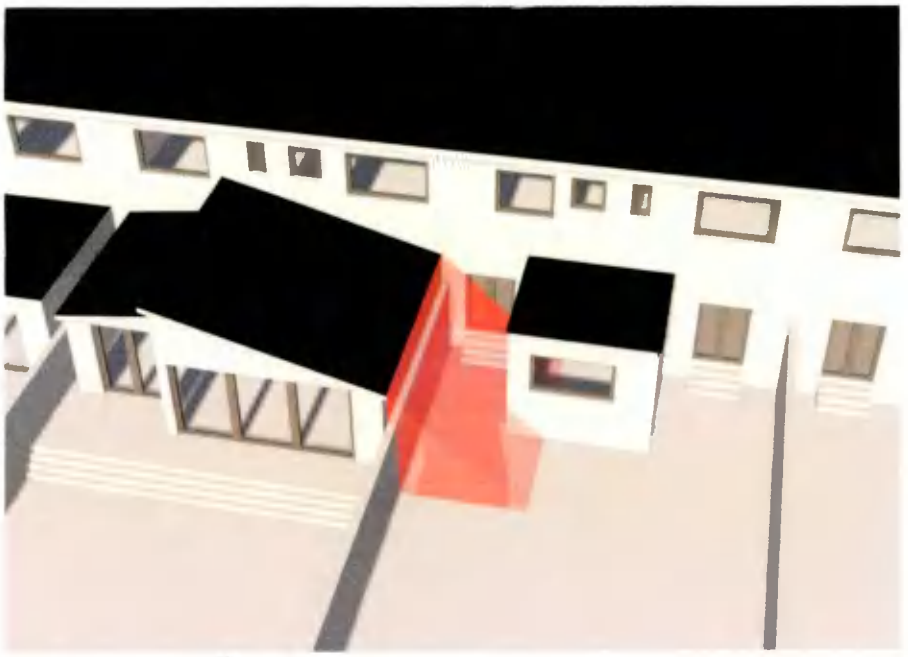


Figure1: 45 Degree Rule - Elevation Extension Line

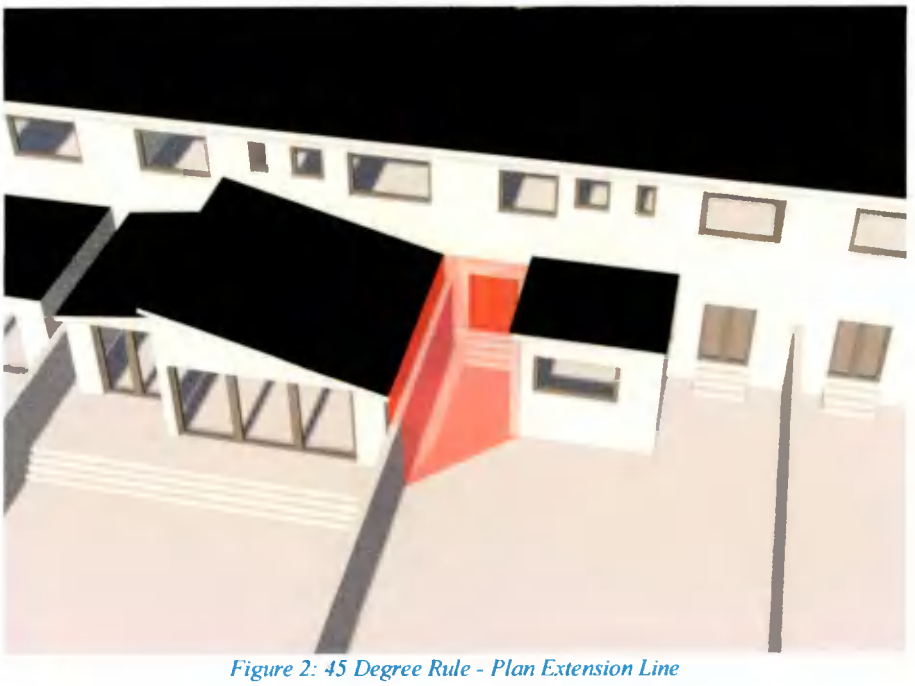


Figure 2: 45 Degree Rule - Plan Extension Line

Looking at the above images of both Elevation and Plan extension lines the centre point of the window to the neighbouring buildings does not fall within *both* the plan and elevation extension lines and thus the development conforms with the '45-degree approach for scenario one.

3. Vertical Sky Component (VSC)

The BRE document definition of the (VSC) is: Ratio of the part of illuminance, at a point on a given vertical plane, that is received directly from a CIE (International Commission on Illumination) standard overcast sky, to illuminance on a horizontal plane due to an unobstructed hemisphere of this sky. Usually the 'given vertical plane' is the outside of a window wall. The VSC does not include reflected light, either from the ground or from other buildings.

The VSC is usually expressed as a percentage and the maximum value for a completely unobstructed window is slightly less than 40%. The recommendations set down in the BRE report,' Site layout for daylight and sunlight, a guide to good practice', would indicate, for residential properties, that a VSC value of greater than 27% is acceptable. However, a 20% VSC is good for an urban area.

If a window achieves less than 27% but the difference is not <0.8 times the existing value, this is also deemed acceptable.

It should be noted that the guide itself, within the introduction, states that the advice given was not mandatory and the Guide should not be an instrument of planning policy, its aim being to help rather constrain the designer. Although it gives numerical guidelines, these should be interpreted flexibly.

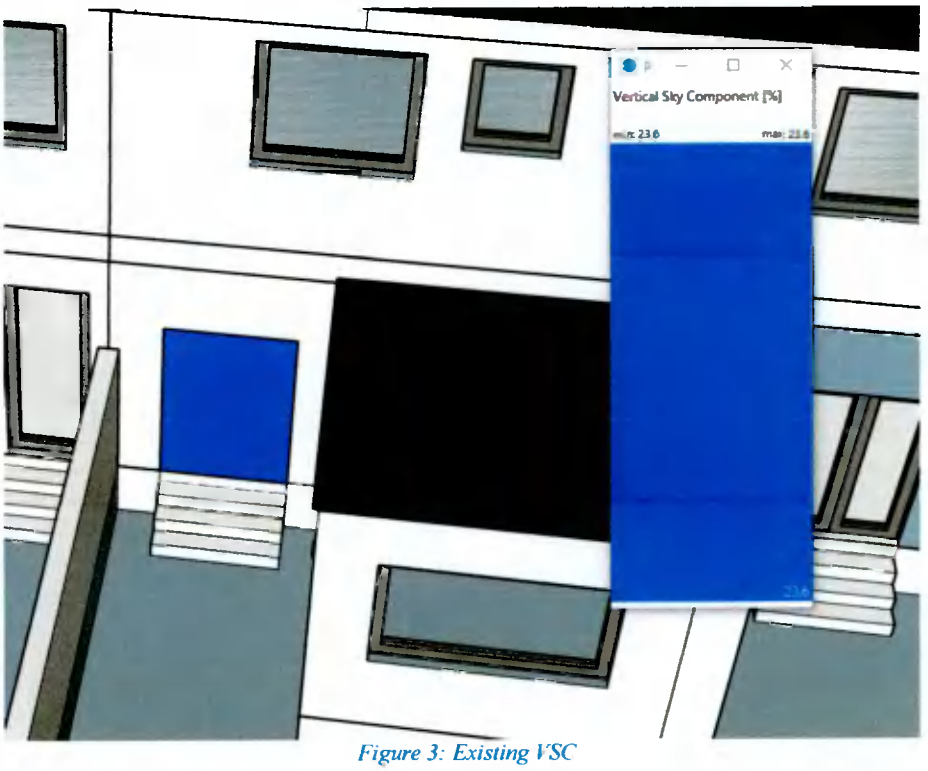


Figure 3: Existing VSC

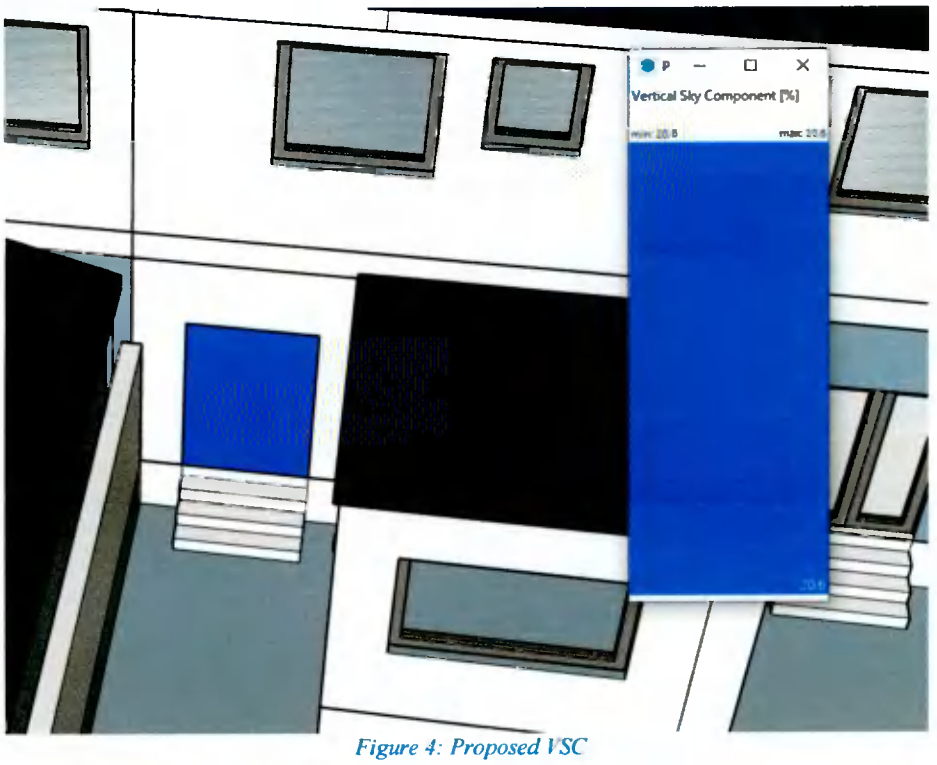


Figure 4: Proposed VSC

Window ID	Required Minimum	Proposed	Existing	Difference	Compliance Demonstrated
1	27	20.6	23.6	0.87	Yes

Table 1: VSC Results

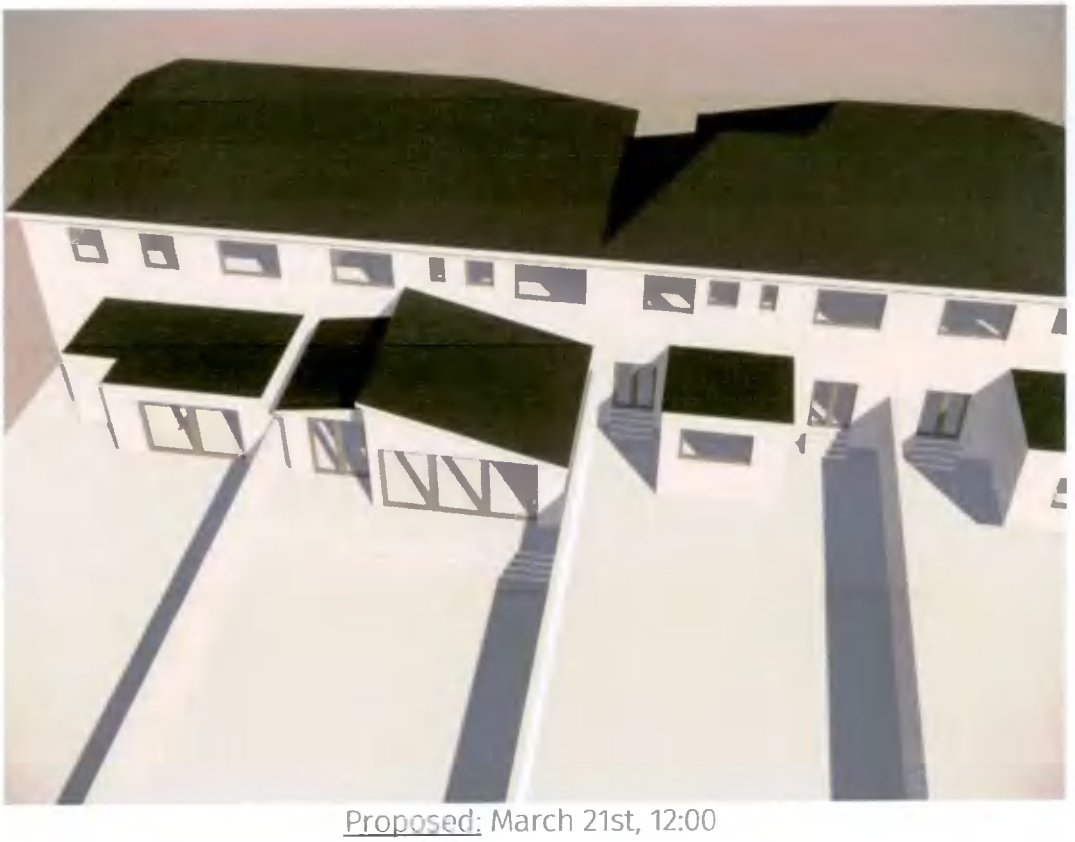
4. Overshadowing

The following images illustrate the shadows cast on the neighbouring amenity areas between 10:00 and 16:00.

Existing: March 21st, 10:00

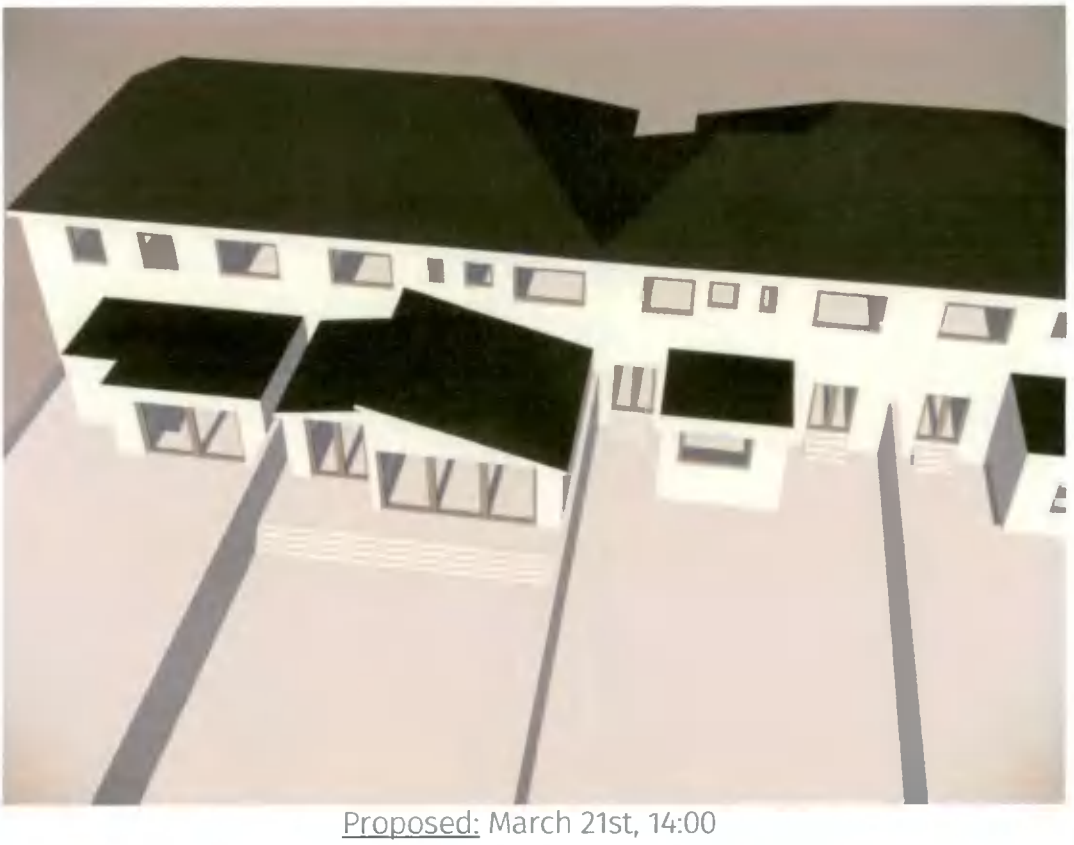
Proposed: March 21st, 10:00

Existing: March 21st, 12:00



Proposed: March 21st, 12:00

Existing: March 21st, 14:00



Proposed: March 21st, 14:00

Existing: March 21st, 16:00

Proposed: March 21st, 16:00

Existing: June 21st, 10:00

Proposed: June 21st, 10:00

Existing: June 21st, 12:00

Proposed: June 21st, 12:00

Existing: June 21st, 14:00

Proposed: June 21st, 14:00

Existing: June 21st, 16:00

Proposed: June 21st, 16:00

Existing: June 21st, 18:00

Proposed: June 21st, 18:00

Existing: September 21st, 10:00

Proposed: September 21st, 10:00

Existing: September 21st, 12:00

Proposed: September 21st, 12:00

Existing: September 21st, 14:00

Proposed: September 21st, 14:00

Existing: September 21st, 16:00

Proposed: September 21st, 16:00

Existing: December 21st, 10:00

Proposed: December 21st, 10:00

Existing: December 21st, 12:00

Proposed: December 21st, 12:00

Existing: December 21st, 14:00

Proposed: December 21st, 14:00

5. Conclusion

45-Degree Rule

The 45-degree rule was applied to the proposed development, and it showed that the proposed development passed the BRE guideline.

Vertical Sky Component (VSC)

Adjacent door in No. 14 Templeville Drive was analysed for VSC. The analysis showed that the VSC would be reduced to 0.87 times the existing scenario value thus passing the BRE guideline level (<0.8)

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