



# Green Star

# Daylight Hand Calculation Guide

16<sup>th</sup> September 2013

## Changelog

Date	Version	Change
16 <sup>th</sup> Sept 2013	0.1	Draft Issued for Comment

## Contents

Contents.....	2
1.0 Introduction .....	3
2.0 Overshadowing Requirements.....	4
3.0 Visual Transmittance of Glazing .....	5
4.0 Calculating the Zone of Compliance .....	6
5.0 Documentation Guidelines .....	8
6.0 References.....	8
Appendix A.....	9

## 1.0 Introduction

The hand calculation method for daylight outlined in this guide is applicable to the following Green Star rating tools:

- Green Star - Office v3;
- Green Star - Education v1 (first 3 points only), and
- Green Star - Public Building v1.

For the rating tools listed above compliance is demonstrated by calculating the percentage of the nominated area which has a Daylight Factor of 2% or greater, the hand calculation as detailed in section 4.0 of this guide is deemed acceptable to identify a zone of compliance from which the percentage of nominated area that is compliant can be calculated.

- Green Star – Office Interiors v1.1

For the Green Star Office Interiors v1.1 rating tool compliance is demonstrated by identifying the percentage of work settings located in an area of the floor plate that has a daylight factor of 2.5% or greater as measured at finished floor level, the hand calculation as detailed in section 4.0 of this guide is deemed acceptable to identify a zone of compliance. Any worksettings that are located within the zone of compliance are deemed to comply.

Project registered under Green Star rating tools not covered by this guide are required to submit a credit interpretation request detailing how the guide is being applied to their project.

This document is being provided as a draft for comment. GBCA encourages project teams to use this guide to claim points instead of modelling. In addition, GBCA invites people to provide feedback on the guidance stated below.

### How to demonstrate compliance

To use the hand calculation method the project must meet the following requirements:

- The project is not overshadowed, in accordance with the overshadowing requirements outlined in section 2.0 of this guide; and
- The glazing has a visual light transmittance (VLT) of equal to or greater than 40% as outline in section 3.0 of this guide.

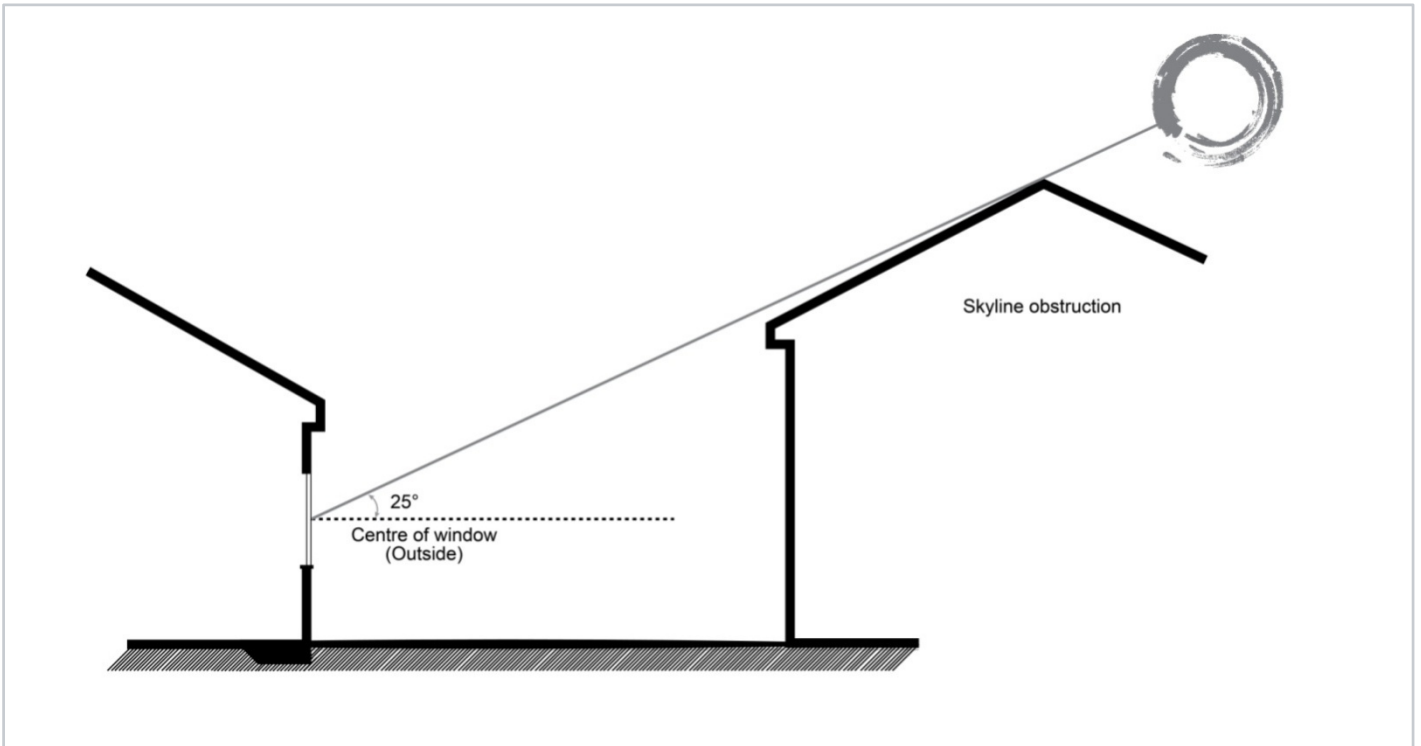
It should be noted that for an Education v1 submission this method cannot be used to demonstrate compliance with the additional point.

The foundation for this method of hand calculation is taken from the DETR Good Practice Guide 245, Desktop guide to daylighting - for architects.

## 2.0 Overshadowing Requirements

Projects where external shading does not impinge on the direct 25 degree line from the mid-height (centre) of the window are deemed to not be overshadowed. External shading includes: buildings, cliffs, and any other solid structure. External shading does not include trees. Please refer to Figure 1 below for further guidance.

**Figure 1: Angle of obstruction for external shading.**



### 3.0 Visual Transmittance of Glazing

This hand calculation method assumes that there is no significant loss of light due to external obstructions, tinted glazing or interior screening.

**For this hand calculation method the glazing must have a visible light transmittance equal to or greater than 40%.**

The following is an indication of typical VLT values for various glazing types:

---

Glazing Type	VLT Range
Clear single glazing	~70 - 90%
Tinted single glazing (green)	~70%
Tinted single glazing (grey)	~20%
Clear double glazing	~70 - 80%
Double glazing with a low emissivity coating	~40 - 70% (but can be as low as 10%)

---

NB: dirt can give a further 5% reduction in VLT with normal cleaning in an urban setting. Reductions in VLT due to dirt do not need to be included for the purposes of a Green Star Daylight assessment.

## 4.0 Calculating the Zone of Compliance

The zone of compliance is an area (in the horizontal plane) that is the width of the window by a depth which is twice the height of the window head above desktop/table top level as illustrated in the Figure 2 below.

*Depth of the Zone of Compliance =  $h \times 2$*

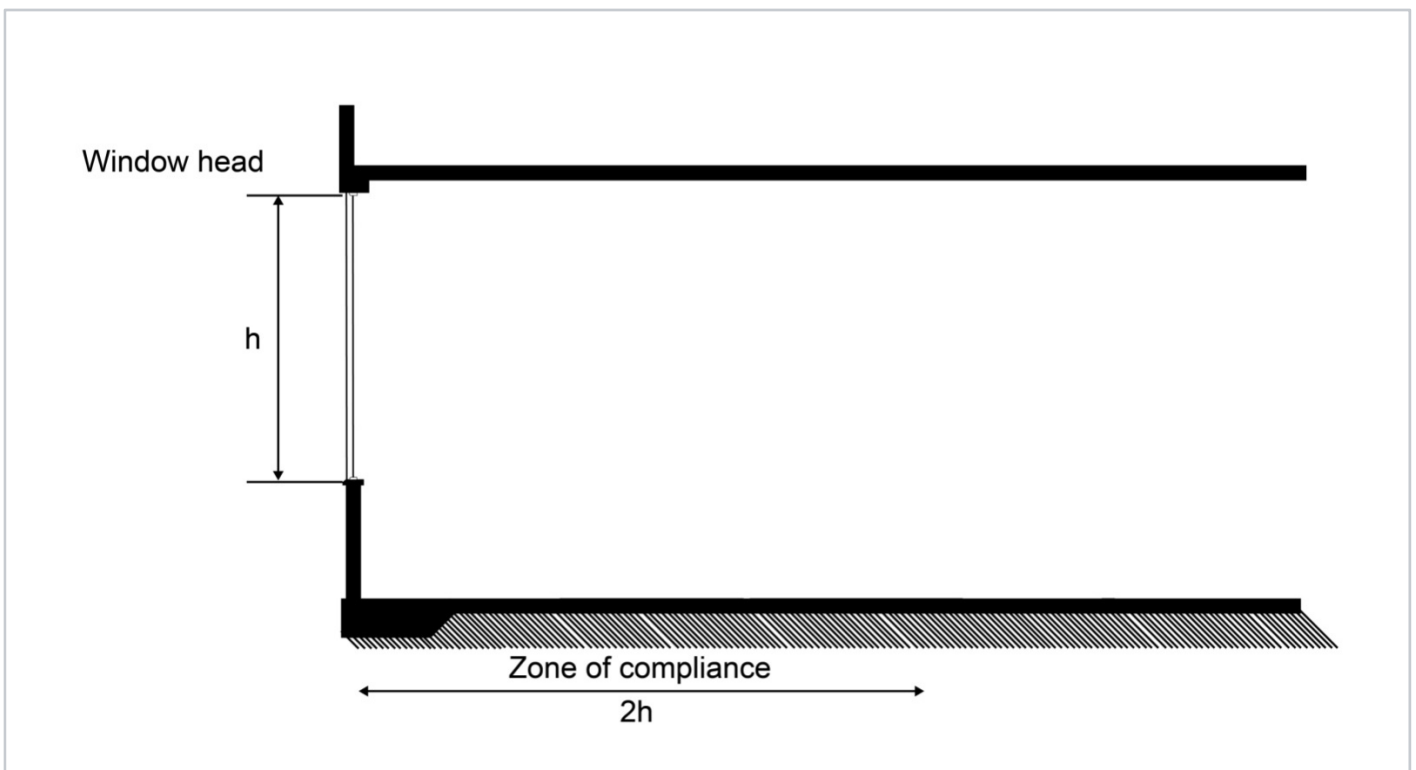
*'w'width of the Zone of Compliance = Width of the glazing*

*Zone of Compliance =  $h \times 2 \times w$*

Additional Notes:

- When plotting the depth of the Zone of Compliance the zone may not be drawn past solid or glazed partitions.
- Any column or mullion < 0.5m in width can be disregarded and the glazing can be considered to be continuous in width.
- For the purposes of this hand calculation desktop/table top level is set at 700mm AFFL for all rating tools.

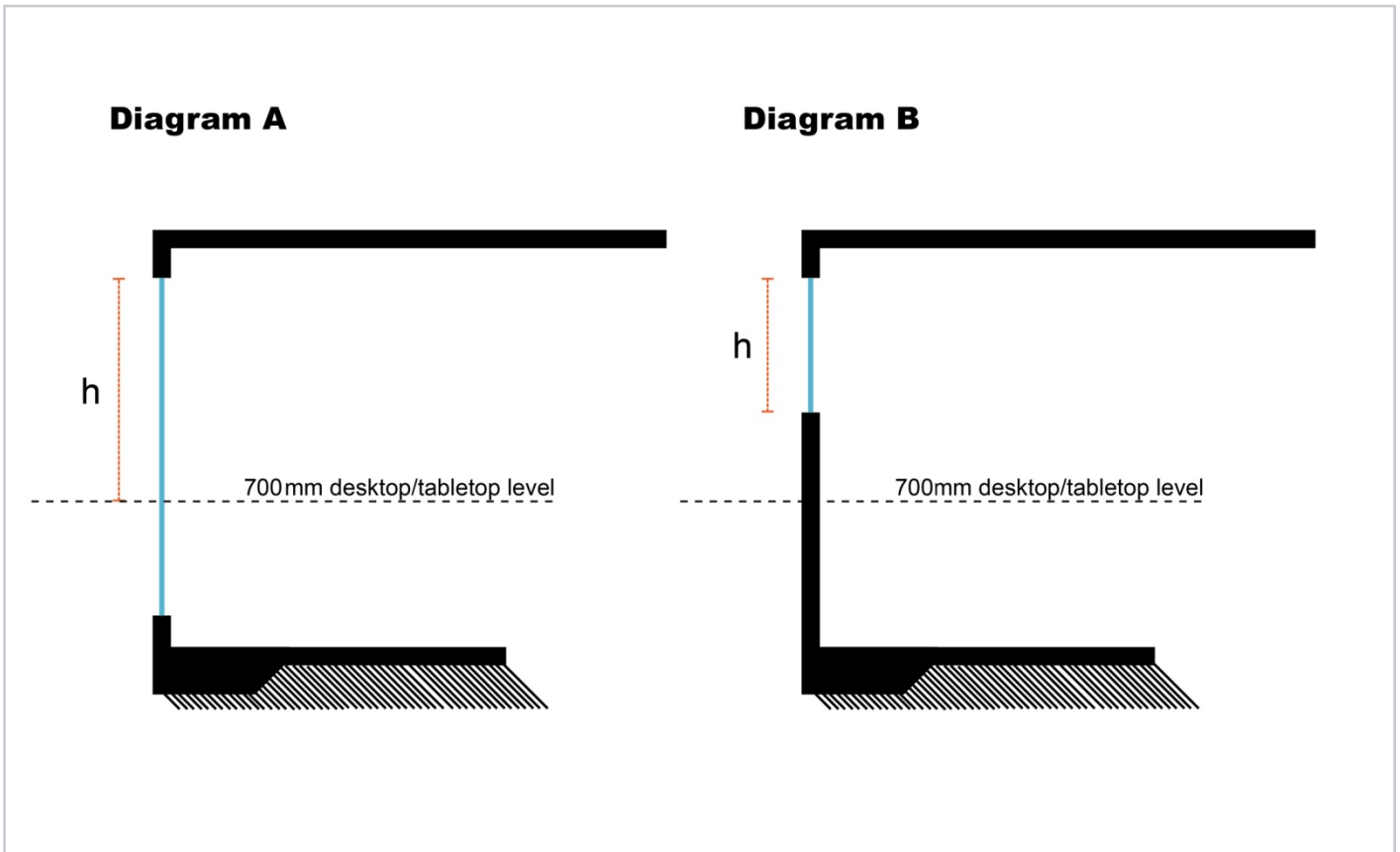
**Figure 2: Dimensions for calculating the zone of compliance.**



When determining the dimension for 'h' the following applies (see the Figure 3 below for further guidance):

- 'h' is the height of the window head above desktop/table top level (700mm) (Diagram A)
- If the bottom sill of the glazing is above desktop/table top level (700mm) the dimension for 'h' is taken from the bottom sill of the glazing (Diagram B).

Figure 3: How to determine the dimension for 'h'.



Once the area of the zone of compliance has been calculated the percentage of compliant nominated area can be calculated.

## 5.0 Documentation Guidelines

Where this hand calculation methodology is being used, please nominate this on the cover page and refer to the documentation requirements outlined here. The documentation outlined here is to be provided in lieu of the documentation outlined within the Technical Manual.

Documentation Guidelines – Deemed to Satisfy for Design and As Built
<b>Submit all the evidence and ensure it readily confirms compliance.</b>
<input type="checkbox"/> Short report
<b>Drawings and plans must be Tender or As Built in line with the rating being sought.</b>
<input type="checkbox"/> Floor Plans
<input type="checkbox"/> Façade Drawings
<input type="checkbox"/> Site Plan
<b>For a Design Submission</b>
<input type="checkbox"/> Extract(s) from the Specification(s)
<b>For an As Built Submission</b>
<input type="checkbox"/> Confirmation from the Head Contractor
<p><b>Short report</b> prepared by a suitably qualified professional that describes how the Credit Criteria have been met using the hand calculation method for Deemed to Satisfy and referencing the supporting drawings. The short report must:</p> <ul style="list-style-type: none"> <li>• Identify all spaces within the building;</li> <li>• Nominate the spaces where the Credit Criteria has been met, and their area; and</li> <li>• Provide a summary table to demonstrate that compliant spaces jointly account for the stipulated proportion of the NLA.</li> </ul>
<p><b>Floor Plans</b> clearly identifying those areas deemed to satisfy using the hand calculation method. All measurements and areas for the calculation must be shown on the plan.</p>
<p><b>Façade Drawings</b> identifying the façade materials in the design and indicating the dimension for 'h' in the hand calculation.</p>
<p><b>Site Plan</b> extending to the surrounding area, identifying the heights and location of any surrounding buildings</p>
<p><b>Extract(s) from the Specification(s)</b> where all glazing properties and minimum visual transmittance levels are nominated.</p>
<p><b>Confirmation from the Head Contractor</b> that the specified glazing products or an equivalent were installed in the building.</p>

## 6.0 References

- The Department of Environment, Transport and the Regions (DETR), 1998, Good Practice Guide 245 'Desktop guide to daylighting – for Architects', <http://www.cibse.org/pdfs/GPG245.pdf>



## Appendix A

Please note that the plans in this appendix are provided as an example of how the daylight hand calculation is applied, and can be illustrated. It is not an example of illustrating compliance or non-compliance.