17 April 2026

NZBC Clause G7 – Natural Light

The purpose of this Technical Bulletin is to provide guidance for the compliance when designing with glass that has a VLT less than 70%.

1) G7/AS1 requires that glass has a VLT greater than 70% to ensure adequate natural light and visual awareness of the outside environment,

2) Glasses with a VLT less than 70% offer an increased range of options for thermal performance compliance with Clause H1 – Energy Efficiency,

3) Glasses with a VLT less than 70% can assist in reducing the risk of overheating in the home.

Executive Summary

For glass with a VLT (visible light transmittance) greater than 70%, **G7/AS1** is most used mechanism to establish compliance for simple buildings less than 3 storeys high.

However, if the building architect/designer is interested to investigate further glass options, for either economic or performance benefits, both **G7/AS2** or **G7/VM1** offer flexibility not available through **G7/AS1** and either can be used as compliance pathways to satisfy the Building Code.

What is Clause G7?

Clause G7 requires,

- That a building is designed to provide sufficient natural light for occupied spaces and appropriate visual awareness of the outside for occupants,
- That habitable spaces to have adequate windows for natural light and visual awareness of the outside environment to safeguard against illness, and loss of amenity due to isolation, and
- That natural light be no less than 30 lux at floor level for 75% of the standard year, and for transparent openings in certain buildings.

Clause G7 offers three compliance pathways,

- **G7/AS1** – Natural Light for simple buildings up to three storeys excluding those with borrowed daylight.
  The scope of the document
  - The ***acceptable solution*** applies to housing, old people's homes, and early childhood centres, up to 3 storeys that are:
    a) Detached; or
    b) Attached side by side multi-unit buildings including townhouses.
    COMMENT: *Old people's homes include aged care facilities, rest homes and retirement complexes.*
  - The acceptable solution applies to habitable spaces with external windows and simple façade designs that can be described by a glazing-to-wall ratio (GWR).

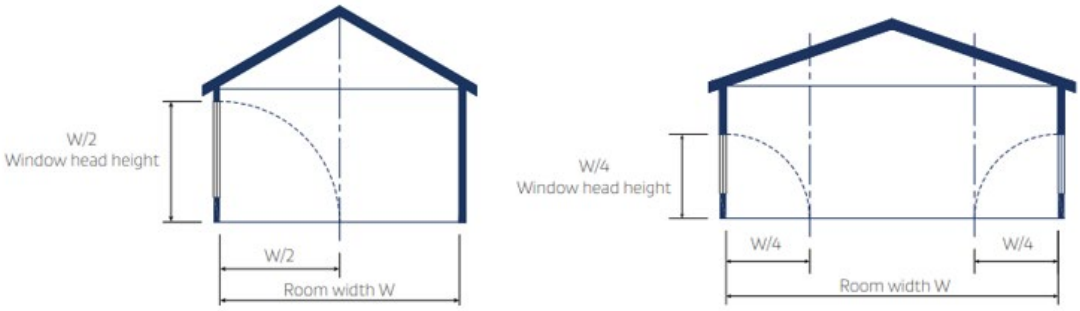
- **G7/AS2** – Natural Light for simple buildings excluding those with borrowed daylight.
  The scope of the document
  - The ***acceptable solution*** applies to housing, old people's homes, and early childhood centres that have habitable spaces with:
    a) Simple façade designs; and
    b) Vertical windows in external walls that can be described by a glazing-to-wall ratio (GWR); and
    c) Typical room heights (2.4 m to 3.0 m); and
    d) Vertical windows with a glazing visible light transmittance (VLT); and
    e) No shading from overhangs or with simple horizontal overhangs.

- **G7/VM1** – Natural Light for all buildings including those with borrowed daylight.
  The scope of the document
  - The ***verification method*** applies to all housing, old people's homes, and early childhood centres including those that have habitable spaces with:
    a) Complex room shapes, ***and***
    b) Rooms with borrowed daylight, ***and***
    c) Rooms with multiple windows, ***and***
    d) Other room scenarios not covered by **G7/AS1** and **G7/AS2.**

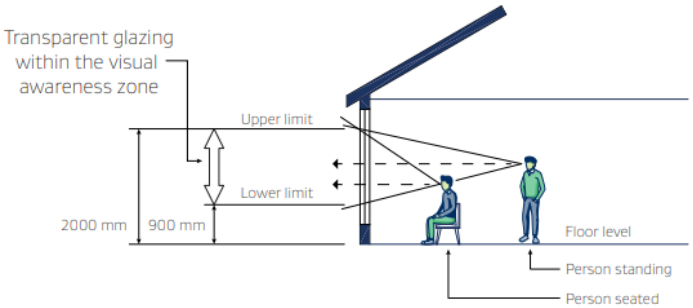
G7/AS1

This acceptable solution provides the simplest pathway to compliance for buildings within its scope, as set out above. There are two requirements within the solution,

1) The illuminance of habitable spaces, where a minimum area of vertical window glazing in exterior walls. The area of glazing must be 10% of the floor area and the glass itself must have VLT (visible light transmittance) of not less than 70%. VLT is the ratio of light passing through the glazing. The higher the percentage the greater the amount of light allowed into the building.
There are also dimensions applied to the windows, which are set out in part 2 of the acceptable solution.



2) Occupants of habitable spaces must have an awareness of the outside environment. Compliance here is demonstrated when at least 50% of the glazed area of the space is transparent glazing and the transparent area is located within an awareness zone set out in part 3 of the acceptable solution.



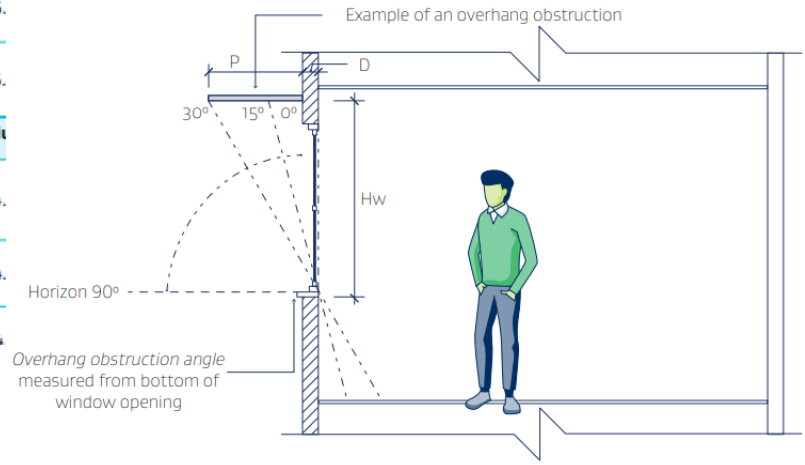
G7/AS2

This acceptable solution can be applied to simple buildings in low, medium and high density developments in a similar way to **G7/AS1**, however, it is seen as more suitable for simple higher rise buildings and apartments. Again, there are two requirements within the solution,

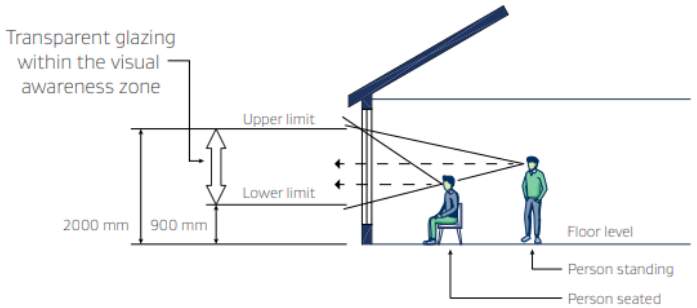
1) The illuminance of habitable spaces. Rather than a simple VLT and percentage of vertical window glazing for the floor area where a minimum area, **G7/AS2** requires the building designer compare the area of glazing to a maximum room depth and then requires a minimum VLT for the glazing based

on these two factors. A table is provided to help assess the requirements of the solution. Because the values are calculated the GWR (glazing to wall ratio) can be between 10% and 90%, and the VLT between 40% and 80%. Further boundaries are set dependent on the shading angle of exterior obstructions and/or shading elements, whether attached to the build, or impacting on it from adjacent.

VLT % (3)		Maximum permitted room depth (m) for different overhang obstruction angles and glazing-to-wall ratios(1),(2),(4)																				
		0° Overhang obstruction angle									15° Overhang obstruction angle									30° Overhang obstruction angle								
		Glazing-to-wall ratio %									Glazing-to-wall ratio %									Glazing-to-wall ratio %								
		10	20	30	40	50	60	70	80	90	10	20	30	40	50	60	70	80	90	10	20	30	40	50	60	70	80	90
Minor obstructed exterior context(≥ 0° to < 20° AEOA)																												
Thermal - Low-E - Clear glazing	80	4.2	5.4	6.3	6.6	7.0	7.2	7.4	7.5	7.8	3.9	5.1	6.0	6.3	6.8	6.9	7.0	7.2	7.6	3.6	5.0	5.8	6.1	6.6	6.7	6.8	7.0	7.4
	70	4.0	5.2	6.0	6.2	6.6	6.8	6.9	7.2	7.6	3.8	5.0	5.8	6.0	6.6	6.6	6.7	6.8	7.2	3.5	4.8	5.6	5.8	6.2	6.3	6.4	6.6	7.0
	60	3.7	4.7	5.6	6.0	6.4	6.5	6.6	6.8	7.2	3.4	4.4	5.4	5.6	6.0	6.1	6.2	6.4	6.7	3.2	4.4	5.2	5.5	5.9	6.0	6.1	6.3	6.7
	50	3.4	4.4	5.2	5.6	6.0	6.0	6.1	6.																			
	40	3.2	4.1	4.7	5.1	5.5	5.6	5.7	6.																			
Medi																												
-E - Clear glazing	80	3.1	3.5	3.8	3.8	4.0	4.1	4.2	4.																			
	70	3.0	3.4	3.7	3.8	3.9	4.0	4.1	4.																			
	60	3.0	3.4	3.6	3.7	3.8	3.9	4.0	4																			



2) As with **G7/AS1**, occupants of habitable spaces must have an awareness of the outside environment as set out in part 3 of **G7/AS2**.



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G7/VM1

G7/VM1 is the modelling method of natural light. Compliance is again required in the areas of illuminance and visual awareness of outside environment, but with **G7/VM1** this is verified through computer modelling of the proposed building and its surroundings. Of course, the model allows the input of specific VLT percentages and suggests this is based the manufacturer's data. It does however provide an indicative table of values, but this is **no substitute** for actual performance information provided by local glass suppliers.

COMMENT: Indicative *visible light transmittance* (*VLT*) values for glazing include:

- Single clear glass: *VLT* of approximately 90%; and
- Double clear glass with no Low E coating: *VLT* of approximately 80%; and
- Double clear glass with Low E coating or triple clear glass: *VLT* of approximately 70%; and
- Tinted or clear glass with light solar control: *VLT* of approximately 60%; and
- Tinted glass with medium solar control: *VLT* of approximately 50%; and
- Tinted glass with high solar control: *VLT* of approximately 40%.

Standards References

- **NZS 6703:1984** – Code of practise for interior lighting design
- **AS/NZS 1680.1:2006** – Interior and workplace lighting. General Principles and Recommendations

Further information

Sustainable Engineering

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