TECH NOTE 1

NCC 2019 SECTION J

As of the **1st of May 2020**, the new National Construction Code (NCC) 2019 Section J requirements come into regulatory effect with the end of the twelve-month 'discretionary' transition period.

This revision of Section J introduces a number of enhanced thermal envelope energy efficiency requirements which will influence architectural design. Previously accepted solutions, systems and approaches may no longer be compliant.

LUCID CONSULTING AUSTRALIA

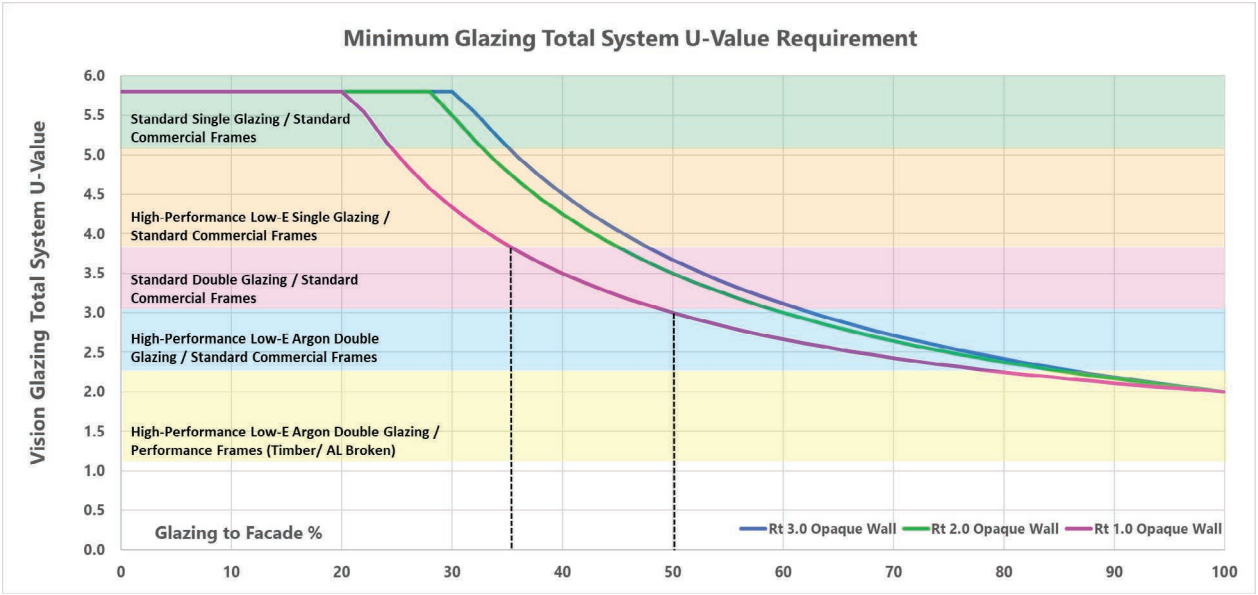
TECH NOTE 1 - GLAZING

This technical note provides concise information on the changes as related to external glazing compliance assessment and performance requirements, with case study examples. Please note that the following information is generic to building class and climate zone. Some building classes or climate zones may have specific requirements.

EXTERNAL GLAZING

The legacy Deemed-to-Satisfy (DTS) Glazing Calculator has been replaced with a new and comprehensive **NCC Façade Calculator**. The Façade Calculator enables the compliance assessment of **wall-glazing constructions** (including spandrels), providing a whole-of-facade approach. More flexible than the previous Glazing Calculators, the new Façade Calculator offers advantages similar to performance-based JV3 modelling with trade-off between glazing and walls permissible for DTS compliance. The total system U-value for **wall-glazing construction** must not be more than U_T 2.0 W/m^{2}K for most non-residential building classes and climate zones. Whilst walls contribute to overall compliance of a **wall-glazing construction**, back-stop total system R-values are provided to ensure minimum outcomes.

Using the wall-glazing construction total system U-value requirement and the minimum R-value performance requirements of walls, the below chart displays the relationship between glazing total system U-value performance and glazing-to-wall ratio (facade opacity).



Minimum glazing total system U-value compliance requirements have increased in stringency. Generally for facades with less than 80% glazing to façade area, standard double glazing in standard commercial aluminium framing systems can be expected above 35% glazing to façade area ratio. Very high performance glass (e.g. low-e argon double glazing with high-performance framing systems) can be expected above 65% glazing to façade area ratio. Although an increase in stringency, flexibility is offered in the combined assessment of wall-glazing constructions; vision glazing performance requirements (U-value) can be relaxed through increased R-value performance of opaque walls.

Total system Solar Heat Gain Coefficient (SHGC) is similarly considered within the DTS Façade Calculator via a whole-of-façade approach utilising maximum **solar admittance** (the fraction of transmitted solar radiation incident on a wall-glazing construction). Considerations of appropriate total SHGC for compliance in context of façade orientation, shading provisions, building class and climate zone will be generally consistent with previous Section J requirements, however, are design specific.

Spandrel panels also have greater attention within NCC Section J 2019 with specific guidance on the calculation of thermal performance accounting for the framing systems. To demonstrate the difference, the table below shows the total system R-value when calculated using the legacy Section J and the new version. It is important to note that this will not alter spandrel design - it represents an improvement to the accuracy of calculating spandrel thermal performance. In all instances, minimum thermal compliance of spandrel sections will only be met through the inclusion of secondary insulated wall behind the spandrel.

Construction	Spandrel Panel with Thermally Unbroken framing	Spandrel Panel with Thermally Broken framing
Added Insulation	R_M 2.0 Glasswool	R_M 2.0 Glasswool
Total System R-Value Under NCC 2016	R_T 2.6	R_T 2.6
Total System R-Value Under NCC 2019	**R_T 0.45**	**R_T 1.09**

To illustrate the differing glazing performance requirements between NCC 2019 Section J and legacy versions, please refer to the accompanying case studies (over page).

LUCID COMMENTS

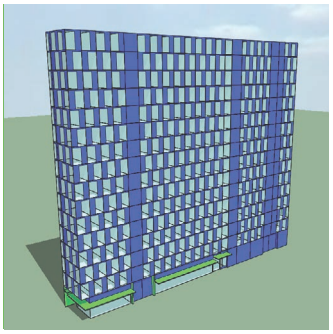
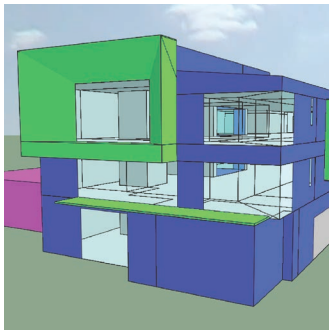
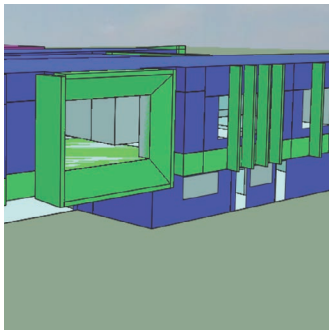
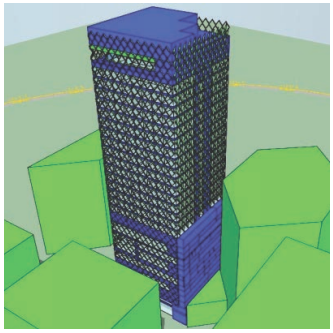
- The **retiring of the old DTS Glazing Calculators is great news** for the industry. The new DTS Façade Calculator provides for significantly more flexibility using a whole-of-façade approach.
- Generally as a façade whole, most building classes and climate zones will see an **increase in stringency of glazing performance** given façade opacity.
- Trade off between vision glazing performance and performance of opaque elements of the façade will be possible without the need for JV3 modelling, which will be good. Although JV3 modelling **may still be required** for other design rationalisation activities.
- **More accurate representation of the thermal performance** of spandrels (or lack thereof) aligns performance expectations across façade design and mechanical services. This was a major flaw of NCC Section J previously.
- The concept of **'solar admittance' will take some time to get used to**, however is a better representation in context of overall façade design.

FURTHER INFORMATION

Please refer to the full series of Lucid NCC Section J 2019 technical notes for further discussion of the changes. If you require assistance on a specific project or have a general query related to NCC Section J 2019, please contact Lucid Consulting at the following address **(NCC2019SectionJ@lucidconsulting.com.au)** and a member of our Energy and Sustainability team will be in contact to assist you.

GLAZING CASE STUDIES

The following project case studies have been assessed using the NCC 2019 Section J DTS Façade Calculator and the legacy NCC 2016 Section J JV3 performance-based modelling and the DTS Glazing Calculator. Glazing performance parameters have been resolved which meet minimum Section J requirements.

Case Study 1:	**Case Study 2:**	**Case Study 3:**	**Case Study 4:**
Class 3 Hotel Adelaide	Class 5 Office Adelaide	Class 9b School Melbourne	Class 3 Hotel Adelaide
(Glazing Façade Area 35%)	(Glazing Façade Area 34%)	(Glazing Façade Area 34%)	(Glazing Façade Area 73%)
			
NCC 2016 **U_T=2.7 W/m²k** **SHGC=0.23** High-performance Low-E double glazing with solar control (grey / neutral) with standard frames.	**NCC 2016** **U_T=5.3 W/m²k** **SHGC=0.49** High-performance Low-E single glazing with moderate solar control (neutral / clear) with standard frames.	**NCC 2016** **U_T=4.0 W/m²k** **SHGC=0.4** High-performance Low-E single glazing with moderate solar control (neutral / clear) with standard frames.	**NCC 2016** **U_T=3.1 W/m²k** **SHGC=0.30** High-performance Low-E double glazing with solar control (grey / neutral) with standard frames.
NCC 2019 **U_T=4.4 W/m²k** **SHGC=0.18** High-performance Low-E single glazing with solar control (grey) with standard frames.	**NCC 2019** **U_T=5.0 W/m²k** **SHGC=0.36** High-performance Low-E single glazing with solar control (grey / neutral) with standard frames.	**NCC 2019** **U_T=3.9 W/m²k** **SHGC=0.44** Standard double glazing with moderate solar control (neutral / clear) with standard frames.	**NCC 2019** **U_T=2.3 W/m²k** **SHGC=0.14** High-performance Low-E double glazing with high solar control (grey) with high-performance frames.
Comment U-value performance less stringent however greater solar control.	**Comment** U-value performance generally the same however increased stringency of solar control.	**Comment** Slight increase in stringency of U-value performance and minor relaxation of solar control requirement.	**Comment** Significant increase in glazing stringency due to high glazing to façade area ratio. Most pronounced impact is on solar control.

Note: SHGC requirements highly dependent on façade orientation and climate zone.