AUSTRALIAN GLASS & WINDOW ASSOCIATION

TECHNICAL FACT SHEET: NCC 2019 - SECTION J

Version 1 Released June 2019

The National Construction Code (NCC) of 2019 was published on the 1st February 2019 and, subject to state and territory transitional arrangements, adopted on the 1st May 2019.

One of the most notable additions to the NCC impacting the window and door industry is the new provisions under Section J in Volume 1 impacting commercial buildings in Classes 2 - 9.

A COMPLETELY NEW METHODOLOGY

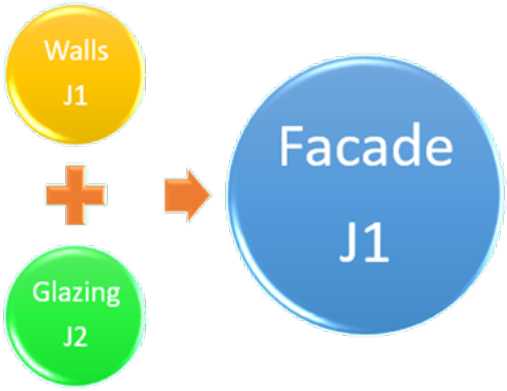
The new Section J provisions introduce a number of factors and substantial changes in how building energy usage is modelled. Firstly, and perhaps most significantly, the usage patterns of a building serve as a key driver in determining its energy use. Buildings that are predominantly day-time usage, such as shopping centres, offices and most retail and commercial spaces, use energy very differently to buildings which are predominantly night-time or mixed usage, such as multiple dwellings (Class 2 common areas), hospitals, and short-term accommodation.

Modelling indicates, that the primary driver behind energy consumption (from a heating, cooling and lighting perspective) in buildings which have a higher proportion of day-time usage is passive solar heat gain. It stands to reason therefore that, especially in warmer climate zones, lower SHGC's will be specified in these instances, and therefore the use of solar control glass types is likely to become more predominant.

Image: Solar control glass in a commercial building

Another notable change in the methodologies of the new 2019 Section J is that the former provisions for walls (J1) and for glazing (J2) have been combined into Part J1 with target requirements specified for the 'total façade'.

SIGNIFICANT CHANGE FOR GLAZING INDUSTRY



The construction of walls and glazing are a major contributing factor in the overall thermal performance of the building and, consequently, window systems are now considered as an integral part of the total façade. The window to wall ratio, or total glazed area as a fraction of the façade, becomes a key metric in determining the overall performance of the façade.

PERFORMANCE REQUIREMENTS

The Performance Requirements in NCC 2019 have been largely re-defined, with specific, measurable objectives introduced to cap total energy usage for conditioned spaces to within prescribed limits depending on the building classification.

Excerpt from NCC 2019 Section J

JP1 Energy use

A building, including its services, must have features that facilitate the efficient use of energy appropriate to—

(a) the function and use of the building; and

(b) the level of human comfort required for the building use; and

(c) solar radiation being—

(i) utilised for heating; and

(ii) controlled to minimise energy for cooling; and

(d) the energy source of the services; and

(e) the sealing of the building envelope against air leakage; and

(f) for a conditioned space, achieving an hourly regulated energy consumption, averaged over the annual hours of operation, of not more than—

(i) for a Class 6 building, 80 kJ/m².hr; and

(ii) for a Class 5, 7b, 8 or 9a building other than a ward area, or a Class 9b school, 43 kJ/m².hr; and

(iii) for all other building classifications, other than a sole-occupancy unit of a Class 2 building or a Class 4 part of a building, 15 kJ/m².hr.

PERFORMANCE SOLUTIONS AND VERIFICATION METHODS

The intent of any Verification Method is to demonstrate that a Performance Solution meets the Performance Requirement(s). To demonstrate compliance (of a performance solution) with JP1, Section J provides 4 Verification Methods as follows;

JV1 NABERS Verification Method

JV1 is applicable only to Class 5 office buildings. It is not applicable to other classes of buildings.

Verification Method JV1 allows the use of the NABERS Energy for Offices base building Commitment Agreement modelling protocols and schedules to demonstrate compliance.

JV2 GREEN STAR Verification Method

JV2 is applicable to all Class 3 buildings, all buildings Class 5 to 9 and common areas of Class 2 buildings. It cannot be applied to the Single Occupancy Units (SOU) of a Class 2 building or a Class 4 part of a building.

Verification Method JV2 allows the use of the Green Star - Design & As-Built rating tool to demonstrate compliance.

JV3 Reference Building Verification Method

JV3 is applicable to all Class 3, Class 5 to 9 buildings and common areas of Class 2 buildings. It cannot be applied to the SOUs of a Class 2 building or a Class 4 part of a building.

Verification Method JV3 can be used to assess a Performance Solution, demonstrating compliance of a building by comparing its energy usage to a reference building.

JV4 Building Envelope Sealing Verification Method

JV4 can be used in all Class 2 – 9 buildings to assess a Performance Solution, demonstrating compliance JP1(e) in NCC Volume One. It can be used instead of the DTS Provisions of Part J3.

JV4 provides a means of demonstrating compliance with the building sealing requirements in JP1(e) through testing, commonly referred to as a blower door test.

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DEEMED-TO-SATISY (DTS) SOLUTIONS

Wall-glazing construction

For the purposes of Section J in Volume One, "wall-glazing construction" means the combination of wall and glazing components comprising the envelope of a building, excluding—
(a) display glazing; and

(b) opaque non-glazed openings such as doors, vents, penetrations and shutters.

Envelope

Envelope, for the purposes of Section J in Volume One, not only means the external walls on the perimeter of a building, but includes internal walls, floors and ceilings where they separate a conditioned space from a non-conditioned space.

Display glazing

Display glazing means glazing used to display retail goods in a shop or showroom directly adjacent to a walkway or footpath, but not including that used in a café or restaurant.

J1.5 WALLS AND GLAZING

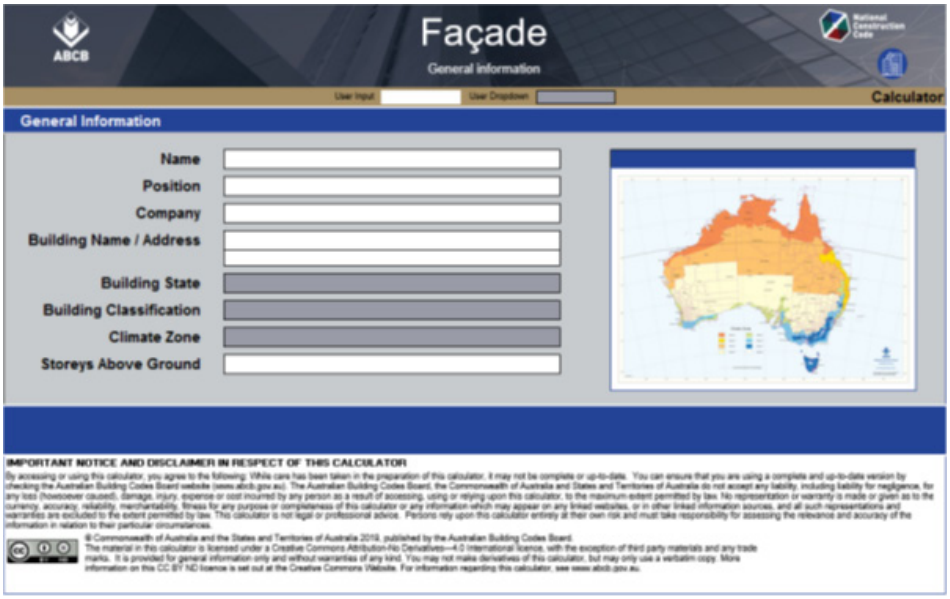
Under the Deemed-To-Satisfy provisions J1 – Building Fabric, Total System U-Value and solar admittance for a façade (wall + glazing) are specified in J1.5. These provisions require the thermal performance (glass and frame) of the glazing elements in the wall-glazing construction to be the Total System U-Value and Total System SHGC as specified in the Technical Protocols and Procedures Manual for Energy Rating of Fenestration Products of the AFRC.

Similarly, provisions for the Total R-Value of the wall component of a wall-glazing construction are provided.

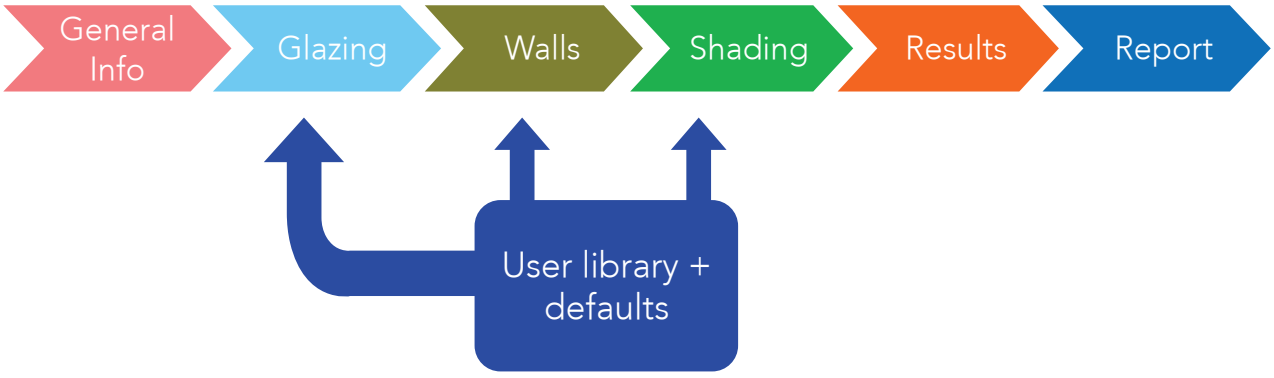
INTRODUCTION OF FAÇADE CALCULATOR

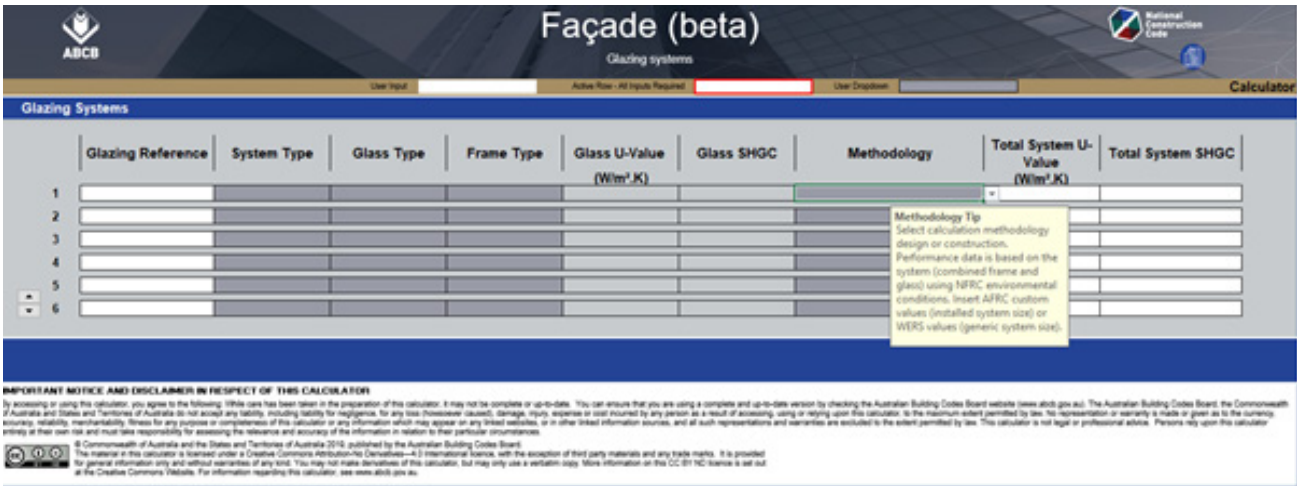
The Façade Calculator will replace the existing Glazing Calculator and can perform the following functions.

- Calculate total U-value and Solar Admittance of the wall-glazing construction
- Includes thermal bridging
- Check total R-value for opaque façade
- Check compliance using Method 1 and Method 2
- Can optimise windows, shading, insulation and thermal bridging
- Generate summary report
- Set reference building for JV3

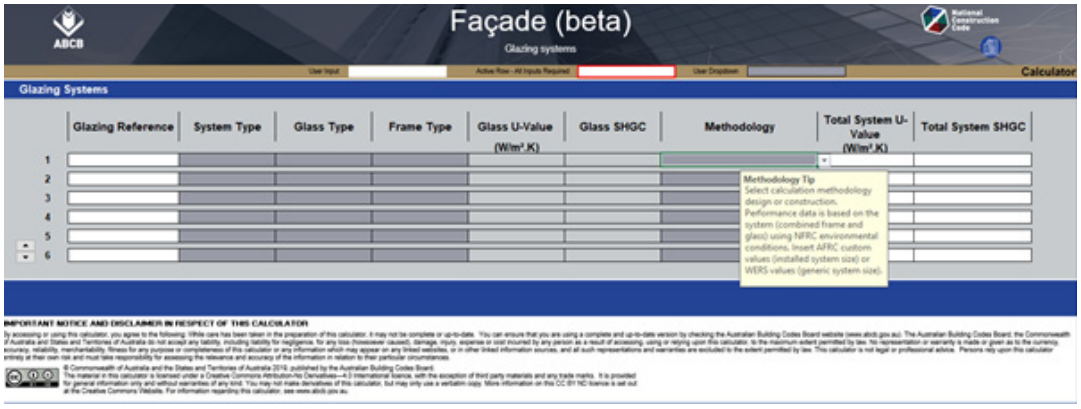


HOW IT WORKS





There are multiple steps involved which must be completed before the calculator can give a final result and a report. Each step is assisted by the inclusion of user library which contains pre-filled values as well as a section where user can create unique library. The principal methodology to input glazing system values are either the WERS (default module size) or AFRC (true module size), where AFRC true module size relates to the at-size rating.



As per specification J1.5a, the compliance of wall-glazing system can be obtained by achieving U-value and solar admittance requirements as determined either by Method 1 or Method 2. Both these methods represent a DTS compliance pathway. The output of proposed system design should fall under the DTS reference line in either Method 1 or Method 2 for both wall-glazing U-value and solar admittance.

J3 BUILDING SEALING

The building sealing DTS Provisions within Part J3 have been developed to control unwanted air leakage into and out of the building envelope.

Good building sealing to minimise air leakage will have a major impact on the thermal performance of the building, especially with regard to reducing the energy required for heating and cooling.

There are no specific new provisions introduced in 2019, however a new Verification Method (see JV4 above) provides a method of demonstrating compliance with the building sealing requirements outlined in JP1(e).

The requirements of Part J3 apply to the elements forming the envelope of a Class 2 to 9 building, however there are a number of exemptions which are intended to exempt those buildings or parts of buildings that should not be sealed for one reason or another including:

- Buildings in climate zones 1, 2, 3 and 5 where evaporative coolers are the only means of air-conditioning. This concession recognises that the evaporative cooler requires external air to be introduced to allow the cooler to work effectively; or
- Permanent building openings needed for the safe use of a gas appliance. This may include wall vents and the like. However, the concession is limited to the areas required for the safe operation of that equipment. To determine the appropriate area, evidence should be received from the appliance manufacturer as part of the building approval process; or
- A building or space where the mechanical ventilation required by Part F4 provides sufficient pressurisation to prevent infiltration, i.e. the ventilating air needs to be relieved.

Windows and doors forming part of the envelope between a conditioned and non-conditioned space must be sealed. Windows and doors that comply with AS 2047 (Windows in buildings – selection and installation) are considered compliant as the Standard contains acceptable provisions for window sealing.

External entry doors leading to a conditioned space with a floor area greater than 50 m² must be self-closing, have an airlock or be a revolving door to minimise loss of conditioned air. This provision applies to all climate zones.

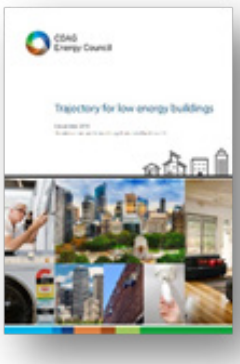
SECTION J IMPLEMENTATION

The Australian Building Codes Board (ABCB) has provided a 12 month implementation period for the new Section J, meaning that up until 1st May 2020, either the 2016 or the new 2019 Section J methodologies may be used to demonstrate conformance, however after this date only the 2019 version may be used.

IMPACT ON INDUSTRY

Whilst there are many variables in determining the likely impact on glazing in buildings, it should be noted that the changes to Section J in 2019 represent the most substantial reforms to energy efficiency in commercial buildings in nearly a decade, and represent an increase in stringency that is likely to considerably increase demand for high performance window and door products and spectrally selective glass options.

FUTURE TRAJECTORY FOR LOW ENERGY BUILDINGS



The National Energy Productivity Plan (NEPP), aims to improve Australia's energy productivity by 40 per cent between 2015 and 2030 and supports the Australian Government's commitment under the Paris Agreement to reducing greenhouse gas emissions to 26 to 28 per cent below 2005 levels by 2030.

Opportunities for future changes in the NCC have been developed by government that consider a broader trajectory for the building sector.

This Trajectory for Low Energy Buildings was developed cooperatively between Commonwealth, State and Territory Governments, and identifies cost effective opportunities for energy efficiency improvements throughout the building system, from thermal performance to appliance energy usage and renewable energy generation.

More Information

The ABCB have published a new handbook on Energy Efficiency Provisions of NCC Volume One. The handbook has a practical focus which enables users to understand the policy objectives and the technical basis of NCC requirements.

The handbook consists a range of examples requiring different design and assessment tools along with a detailed instruction on Façade Calculator including worked examples.

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