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NCC 2019 Section J Impact Report



NCC Section J 2019 Changes

Issue	Description	Author	Date
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The 2019 NCC came into effect on the 1st May 2019 with the exception of Section J. Section J had a one year phase in period due to the substantial increase in stringency.

All projects with construction certificate submitted to council after the 30th of April 2020 are required to comply with Section J 2019 code requirements. The following report provides a summary of the predicted impacts.

Key points to note:

- NCC Section J 2019 aims to reduce the energy consumption of commercial buildings by 30% - 40%.
- NCC 2016 Glass calculators are replaced with NCC 2019 Façade calculators. The façade calculator gives greater benefit to designs with conservative Wall to Window Ratios.
- The cost / benefit analysis that informed the NCC Section J upgrade assumed commercial buildings designed under 2019 code would likely target 30-45% wall to window ratio and concluded that buildings that seek higher wall to window ratios would be significantly penalised.
- Air-conditioned Entry Lobbies and Common Areas of Residential buildings now have to comply with Section J façade calculators.
- Summer cooling has been prioritised with a focus on increased shading and lower Solar Heat Gain Coefficients (SHGCs) to the windows.
- NABERS verification pathway now accepted for offices and Green Star verification pathway now accepted for all other building classes.
- Approximately a 30% increase in consultant time required to complete a Section J, JV3 assessment due to more complex facade calculations, thermal bridging calculations, PMV calculations and increased design advice in order to achieve compliance.

NCC Section	Impacts
J1-J2 Building Fabric/ Building Envelope	<p>WINDOWS</p> <ul style="list-style-type: none"> • Significantly higher performance glazing systems required for designs seeking higher wall to window ratios. • Façade thermal performance requirement of U-Value 2.0. This is further reduced to a U-Value of 1.1 for Class 3 buildings in Sydney climate zones due to the 24/7 operating hours. • Increased requirement for external shading. • Allowable SHGC values reduced significantly placing a greater emphasis on the glazing's Visible Light Transmittance (VLT) to ensure rooms still have a suitable level of day lighting. • Heavily glazed curtain wall facades no longer an option with Australian window solutions. • Holistic façade calculator which allows orientations with low glazing ratio to benefit façade with greater ratio, this will impact U-value only, SHGC assessed by individual façade. • Display glazing concession for a retail shop now applies with a U-Value 5.8 and SHGC 0.81. This is equivalent to single clear glazing (cafes and restaurants excluded)

WALLS

- Thermal bridging calculations now required.
- Thermal breaks now essential to reduce thermal bridging to all wall types including high mass walls.
- Metal framing to walls now heavily penalised due to thermal conductivity. A wall with a total R-value of 2.8 under the 2016 code will reduce to R-value of R1.47 with a 10% bridging area and metal frames with no thermal break under the 2019 calculation method.
- Timber wall frames reduce the thermal conductivity. A wall with a total R-value of 2.8 under the 2016 code will reduce to R-value of R2.37 with a 10% bridging area and timber frames under the 2019 calculation method.
- Larger wall cavities required to cater for increased amounts of bulk insulation.
- Continuous ridge board insulation options do not need to account for thermal bridging and do not require increased wall cavities. This presents ideal thermal outcomes but may require fire engineering solutions.
- A new standard for testing insulation performance values was introduced resulting in the down grade of previous performance values.
- New thermal calculation methods for spandrel panels apply. This may result in a detached internal frame or double glazing with thermal broken frames.
- Quality Control; Greater focus on insulation install methods ensuring insulation forms a continuous layer and is uncompressed. Greater focus on areas with reduced insulation associated with structural columns, services etc.

ROOF / CEILING

- Medium and dark roof colours no longer permitted. Light roof construction with a maximum solar absorptance of 0.45 for DTS assessments.
- Insulation adjustments required for thermal bridging and loss of insulation from lights, ducts etc.

FLOORS

- Slab on ground floors with a high floor perimeter to floor area ratio will now require insulation to achieve a total system R value of R2.0.
- Floors with in slab heating/cooling require an R3.25 insulation under the slab and an R1.0 to the slab edge.



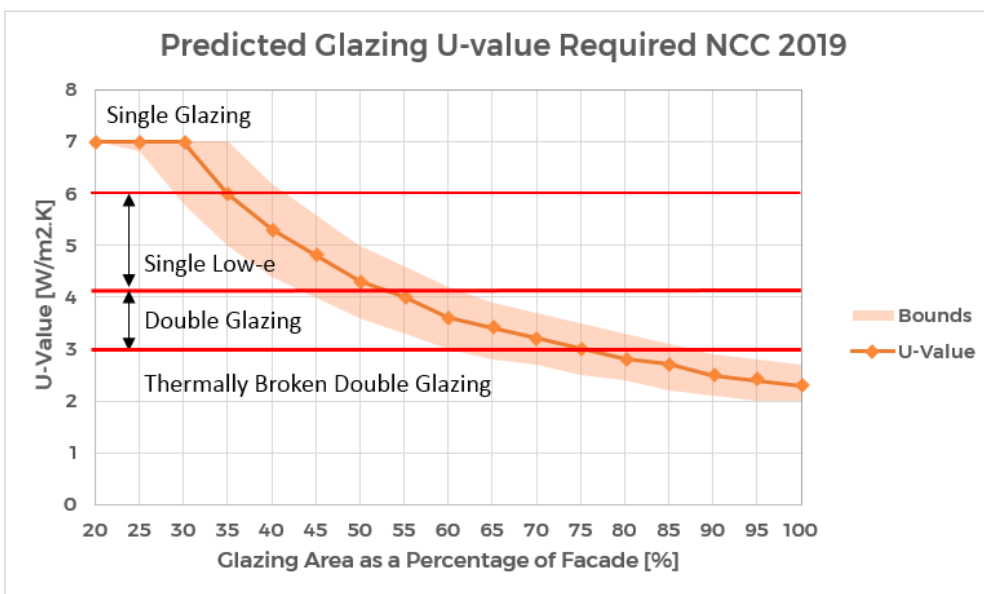
	<p>COMFORT / HEALTH</p> <ul style="list-style-type: none"> • PMV calculation introduced to ensure occupancy comfort to 95% of the occupied floor space for 98% of the time for JV3 assessments. • Blower door pressure testing introduced to ensure buildings are adequately sealed. This testing is optional. • Quality Control; Greater focus on building health in relation to condensation and suitable install methods and product specification in relation to insulation and sarking. <p>ALTERNATIVE SOLUTIONS</p> <ul style="list-style-type: none"> • Calculation method changed from Energy consumption to Greenhouse gas emissions • Increased weighting given to renewable energy sources ie: Solar PV and onsite heat reclaimed systems.
<p>J5 Air Conditioning and Ventilation Systems</p>	<p>To be discussed with the relevant service professional:</p> <ul style="list-style-type: none"> • Under NCC 2019 recirculating range hoods are not compliant and therefore require ducting to the façade. • Low profile exhaust duct work now non-compliant so space needs to be allowed for ventilation in ceiling void or bulkheads included. • Increased requirements for outdoor air heat recovery and CO² control. • Increased fan system efficiency requirements. • Increased pumping system requirements. • Increased piping insulation requirements. • Maximum pressure drops permitted in airside and waterside systems decreased.
<p>J6 Lighting and Power</p>	<ul style="list-style-type: none"> • LED lighting now required throughout, lighting power density allowance reduced by approximately 50% compared to NCC 2016. • Increased requirements for automatic controls, sensors, dimming, etc in order to meet allowable power densities. • Greater focus on loss of insulation from lighting installs. • Fire isolated stairways must also now be controlled by motion sensor.



	<ul style="list-style-type: none"> Architectural lighting directed at the façade required to be LED. Sole occupancy units (except for accessible types) also need to have an occupant sensing device such as card reader, motion detector to automatically cut power to lighting, air-conditioning, bathroom heater and exhaust fans when rooms are unoccupied.
J6 Vertical Transport	<ul style="list-style-type: none"> When lift is unused for 15 minutes; lighting and ventilation must turn off. Escalators and moving walkways must have the ability to slow to between 0.2 m/s and 0.05 m/s when unused for more than 15 minutes. Minimum requirements for energy efficiency class of lifts and for stand by power based on rated load based on ISO 25745.
J7 Pool and Spa	<ul style="list-style-type: none"> Pool cover required when heated by Gas or Electric Heat Pump regardless of location Minimum thermal efficiency for gas heaters. Solar heaters can now be electric boosted.
J8 Facilities for Energy Modelling	<ul style="list-style-type: none"> Time of use data from energy meters must be connected to a centralised monitoring system.

Graphs 1 & 2 below show the predicted glazing U-value and SHGC values respectively for the percentage of conditioned areas façade which will be glazed.

Graph 1: Predicted U-value for the percentage of the conditioned areas façade which will be glazed

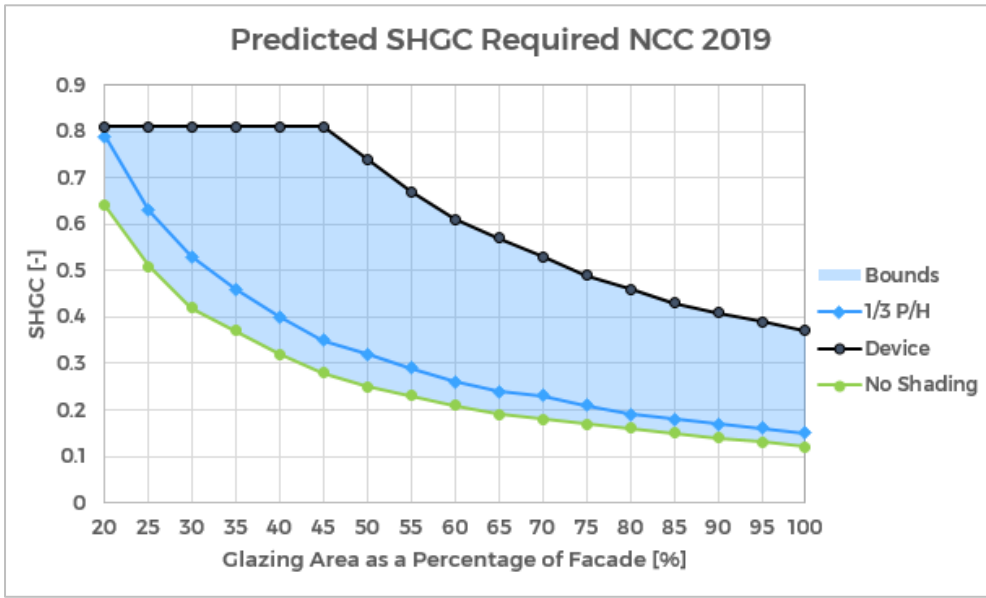


*Based on the remainder of the façade having an average R-value of 2.8

**Class 3 Hotels/ Serviced Apartments and Class 9c aged care not accounted for in the above graph.



Graph 2: Predicted SHGC value for the percentage of the conditioned areas façade which will be glazed



*For a shading device to be recognised in the façade calculator it must be capable of blocking 80% of the summer sun that would have fallen on the window if the device were not installed, and if adjustable, will operate automatically in response to the levels of solar radiation.

**1/3 P/H refers to a 1m projection at the top of a 3m high window or a 33% ratio.

***Class 3 Hotels/ Serviced Apartments and Class 9c aged care not accounted for in the above graph.