



LEGISLATIVE ASSEMBLY
FOR THE AUSTRALIAN CAPITAL TERRITORY

STANDING COMMITTEE ON ECONOMIC DEVELOPMENT AND TOURISM
Mr Jeremy Hanson MLA (Chair), Mr Michael Pettersson MLA (Deputy Chair),
Ms Suzanne Orr MLA, Mr Mark Parton MLA

Submission Cover Sheet

Inquiry into Building Quality in the ACT

Submission Number: 81

Date Authorised for Publication: 5 December 2018



30/11/2018

ACT Government Submission into build quality

I welcome an inquiry into the build quality in the ACT. Compliance with the National Construction Code (NCC) and local legislation is not effectively being followed and, as the Inquiry discussion paper points out, has significant negative impacts on parties involved in the construction sector. There is clearly a need to adjust current arrangements so that the regulatory requirements that contribute to a confident, quality, safe and sustainable construction industry minimise the likelihood and impact of risks arising from poor quality workmanship, unethical practices and less than adequate compliance monitoring and enforcement.

However, in addition to addressing inadequacies with current practices, there is also a need to consider improvements and innovations that can directly contribute to better quality building outcomes for ACT stakeholders across the board. The proposal outlined in this submission (under Terms of Reference 9 - Any other relevant matter) will not only assist in a reduction of compliance issues, defects and subsequent litigation without significant disruption to current practices or additional cost, but it will also improve the energy efficiency of buildings in the ACT and position the ACT as a leader in this field.

This would be achieved through the adoption and implementation of an Air Tightness Requirement (ATR) in both residential and commercial construction as part of the certificate of occupancy process. An air tightness test is simple, non-invasive and provides a clear pass or fail rating for construction practices, build quality and energy efficiency.

Introduction of an ATR is not an increase in regulation but, rather, an introduction of a control that has benefits across the construction industry, government and the community.

The rest of this submission describes what air-tightness testing is, the benefits it can deliver to many parties and a suggestion regarding how such an ATR could be implemented practically in the ACT context.

What is Air Tightness Testing?

Air Tightness Testing is the method of measuring the amount of air lost through a building envelope at a specific pressure. The test uses fans, pressure gauges and software to calculate the leakage rate or Permeability, of 1m² of building envelope at 50 Pascal. It is often called an air leakage test, pressures test or blower door test.

Air leakage is the uncontrolled movement of air through the building envelope / air barrier. It can occur in cracks, gaps in the fabric, incorrectly installed building materials or just poorly chosen materials. Controlled air leakage is called ventilation, poor building practice is not a form of natural ventilation.

When air leakage is reduced the heating and cooling system require less energy to keep a space at the correct temperature because they don't have to compensate for cold, or hot air leaking in through the building envelope needing to be reconditioned. The ACT can be pretty cold and if a door window is not shut properly, we notice the room being colder than the rest of the house. Reducing air leakage is a holistic approach towards keeping the occupant comfortable and the building operating as intended.

The relationship between a reduction in air leakage and energy has been proven and successfully implemented in many countries around the world. Such as the UK, USA, Germany, Canada, Spain, Norway, Sweden, Czech Republic, Denmark, Estonia, France, Portugal, Netherlands and

various cities such as Dubai. None of the above countries have reduced or remove an ATR once introduced, identifying that any adverse effects of building too tight (less than a permeability of 3m3), can be overcome with correct application of design. It is important to note that most adopters of an ATR are cold countries, something that does affect the ACT Region.

An excellent source of information on the benefits of air tightness testing is the Whole Building Design Guide but the National Institute of Building Sciences in the US. It has many participating agencies, such as NASA, and is a building-related guidance for criteria and technology from a whole building perspective.

<https://www.wbdg.org/>

Benefits of an ATR

There are significant benefits for all stakeholders from proper use of air tightness testing and thermal imaging techniques. These include:

- **Objective and accurate information to support defect identification and rectification,**
- **Non-compliance with NCC and other regulatory requirements,**
- **Early and incontrovertible evidence of unethical or incompetent building practices,**
- **Safer and more comfortable living environments for residents,**
- **Reduced energy consumption through cost of operating,**
- **Positive financial flow-on effects through reduced dispute resolution and litigation.**
- **The testing methods and equipment have been designed to be reproduced.**

For example, using air tightness testing and thermal imaging techniques, a qualified Air Technician can ascertain whether or not various NCC requirements have been installed correctly or to the right standards such as in back draft dampers on extraction fans and ducting; floor, door and

window seals; and air conditioning, heating vents; and continues insulation coverage.

The testing can also identify:

- i. Any significant duct leakage including any instances where there is an open end of the duct work not connected.**
- ii. If the building envelope has been built to as per manufacturers specifications.**
- iii. Any ventilation problems that would impact on the health and well-being of residents before a building is occupied. For example, a common problem with precast units is where the building is 'too tight' and requires additional ventilation.**
- iv. Instances where a contractor has removed insulation before the plasterboard has been installed, or the insulation coverage is not consistent.**

At a practical and financial level, information from this process can reduce the specification for, and installation of, unnecessary oversized mechanical systems.

As a compliance tool, use of this objective and evidence-based system would reduce ambiguity of a range of NCC compliance issues and reduces the current reliance on certifiers to absorb responsibility for the identification of building defects.

For individual home owners, such a system provides both financial benefits and higher levels of amenity through reduced energy usage and a more comfortable living environment that will last the life of the building.

[Improving the airtightness in an existing UK dwelling: The challenges, the measures and their effectiveness J. Sadauskiene et al \(2016\) further described](#)

Implementation

Pre-building energy simulation certification can only proactively provide benefit when the industry introduces an energy efficiency policy, and the system evolves it cannot be the only form of compliance for following the Australian Standard and NCC. ATR is a proven and manageable tool for a system that is struggling to maintain the minimum requirement of the NCC.

Using the example of the UK and Cincinnati, in the US's implementation of an ATR I would propose the following 3-year plan and ATR implementation

Year 1- Educate builders, suppliers and owners on what is an ATR, the benefits and how to build more air tight and how to fix air tightness problems. Introduce mandatory testing to establish the current permeability average, low and highs of the current stock and new builds. Use this information to publish issues found during the testing to assist and educate builders in building more airtight. This phase will not require a pass to comply.

Year 2 – Introduce a Nominal ATR figure based on the information gathered in year 1. This is a pass or fail test with a single exception, if the building fails the test a retest can be conducted and if the second test is an improvement compared the first test, it gains a compliance pass, it does not need to achieve the ATR.

Year 3 – Introduce mandatory testing without exceptions. Any building that fails the test will have to be rectified and retested until it passes, without exception. This is the current operation in the UK.

Compliance body

ATTMA and AIVAA

Air Tightness Testing Measurement Association (ATTMA) – are a UK based compliance organisation that manage the lodgement of air tightness test

for 80% of the UK. They review each test to ensure conformance with the testing methodology, equipment calibration, if the building complies with the specified permeability (pass or fail) and issues a certificate to certify the test. They operate in multiple countries and currently have a partnership with the Air Infiltration and Ventilation Association Australia (AIVAA), Australia dedicated air tightness testing organisation.

<https://www.attma.org/>

<https://aivaa.asn.au/>

Conclusion

Despite the obvious array of problems that arise in the construction industry throughout Australia, there are more people working in the sector who do the right thing and who want to make their sector and their clients' building experiences positive and sustainable. The current building system overall is not broken, it just needs help. One way to constructively provide this help is to adopt an evidence based, proven ATR scheme as part of the certificate of occupancy use declaration at the end of a construction project.

The reason for the inquiry is to investigate ways to improve building quality and if a solution can also improve energy efficiency in a cost-effective way, such as ATR, it should be investigated.

**Sincerely,
Andrew Champness
Vice President of AIVAA**

