



Introduction:

Ensuring that the school building airtightness specification is achieved is a key element of the low energy strategy applied in the design and construction of school buildings.

This document addresses some of the frequently asked questions in relation to school building projects.

General Issues:

The integrity of the airtightness barrier is key, if the integrity of the airtightness barrier is broken then it must be repaired. Particular care must be taken when constructing joints and junctions in the building envelope to ensure continuity of the airtightness barrier. Repairs of airtightness construction methods using un-suitable tapes, Rockwool and expanding foam are not acceptable. Un-suitable tapes including duct tape, masking & insulating tape, Rockwool and expanding foam type materials are ineffective in maintaining a durable and airtight seal and shall not be used to maintain continuity of the air tightness barrier at junctions and between construction elements. All materials used to make up the airtight barrier must be IAB certified (Irish Agreement Board).

In addition to the airtightness barrier continuity, care must be exercised at all envelope penetrations and junctions for windows doors, services, cables etc applying appropriate sealing and draught barriers and sealing junctions between the airtightness layer and these elements.

For the airtightness strategy to be successful, it is vital that *all* site workers are aware of the importance of maintaining the integrity of the airtightness barrier. All subcontractors should be briefed on the airtightness strategy and encouraged to report damage of the airtightness barrier on a ‘no fault’ basis.

The Contractor shall take overall responsibility for maintaining continuity of the air tightness barrier. One member of the Contractor’s site team will be nominated to oversee all

details of the airtightness barrier and to maintain quality control in reproducing the design details accurately.

The Contractor shall seek clarification from the Architect of any construction details junctions where the method of maintaining airtightness is not clear to him before construction of the elements takes place.

The Contractor shall ensure coordination of work between different work packages/specialist sub-contractors in defining responsibility for sealing at junctions between different construction elements.

Areas critical in maintaining airtightness include but are not limited to;

- At the roof eaves and gable end junctions
- Wall to roof junction.
- Changes in level in the roof construction.
- Continuity at intermediate floor wall/floor junctions
- At window/door wall junctions.
- At service penetrations
- Construction of the external windows & doors.
- Timber/Steel frame buildings the airtightness membrane needs to be an airtight/breathable material & have no unsealed penetrations. (Materials used for this type of construction should be IAB certified)

Q1: What is the required Airtightness specification for the building?

A1: Check the project contract documentation, the specification is usually between 3 and 5.0 m³/hr/m² when tested to 50Pa unless stated otherwise in the contract documentation.

Q2: What certification should the successful “Airtightness Testing Specialist” obtain?

A2: The testing specialist should be INAB or UKAS Accredited organisation to ISO: 17025 “Environmental Testing of Commercial Buildings” their up to date test certification should be issued to the design team before approval & the certification schedule should be issued with all FINAL reports.

Q3: Who is responsible for the “Envelope Area Calculation”?

A3: The Accredited testing organisation is responsible for the envelope area calculation; this calculation is NOT to be estimated. It is to be calculated in detail from the most current revision of the architect’s drawings in accordance with the ATTMA TS1. A copy of this calculation is to be issued to the design team BEFORE the airtightness test is completed, the calculation should be issued in soft copy included should be ground floor plan, first floor plan, roof plan & GA sections with the airtight line clearly identified.

Q4: What elements of the building should be temporarily sealed for the test?

A4: All mechanical ventilations systems should be turned off & artificially sealed with tape/polythene for the test.
All drainage traps are to be filled with water. (If no water available on-site they may be temporarily sealed with tape)
Should it be the case that the temporary site power for the airtightness test is entering the building through an external window; the external window can be temporarily sealed for the test.

Q5: What elements of the building should NOT be temporarily sealed for the test?

A5: Trickle Vents in windows should be in their closed position & NOT temporarily sealed for the test.

All external doors & windows should be closed & **NOT** temporarily sealed for the test.

All external door thresholds are to be installed for the test & **NOT** temporarily sealed for the test. Internal riser doors can be closed for the test & **NOT** temporarily sealed for the test.

All incoming service penetrations should be permanently sealed for the test. Smoke vents (If applicable) should be closed & **NOT** temporarily sealed for the test.

Q6: *How are Suspended Ceiling Tiles Treated?*

A6: It would be recommended that the airtightness test is carried out before the suspended ceiling tiles are installed in case remedial action is required after the test. If the suspended ceiling tiles are installed at the time of the test, at least 6 perimeter tiles are to be removed for the duration of the test.

Q7: *How are Internal Doors Treated?*

A7: All doors within the airtight line are to be wedged open for the test including staircores, (the internal doors into service risers can be closed for the test but **NOT** temporarily sealed).

Q8: *What is a thermographic survey?*

A8: A thermographic survey is carried out at the end of the project to assess the following

- Thermal bridging of building components
- Potential water ingress into the building.
- Potential Air Leakage & heat loss investigation.
- Potential insulation defects within glazing systems.
- Continuity of the insulation throughout the building.

Q9: *What certification should the successful “Building Thermographer” obtain?*

A9: The building thermography should be carried out by an individual certified as a Civil Thermographer at Level 2 or 3 under the PCN scheme (ISO 18436), and should carry out the duties permitted under ISO 18436. The thermographic equipment should be within calibration, and calibration records should be issued as part of the FINAL report. The thermographic survey should be in accordance with the BS EN: 13187.

Q10: Does my building require a thermographic survey?

A10: The contract documentation should be checked, if thermography is mentioned the survey is to be carried out during favourable weather conditions at the end of the project & the findings of that survey should be issued to the design team.

Q11: What environmental conditions are required to do a successful thermographic survey?

A11: The main condition is the required differential temperature difference between inside & outside; in most cases the thermographic survey is done between November & March during school holidays to achieve the appropriate weather conditions for the survey. For more information on this see the TGD.

Q12: Is a sample room test early in the project to be carried out & why?

A12: Yes a sample room test is required to be carried out on all buildings. Prototype testing of one or more sample rooms, including typical construction junctions between different systems and elements can provide invaluable feedback to the project team before the main airtightness test. Information gained by prototype tests has included ill fitting or incorrect window gaskets, leakage at key construction junctions such as wall to roof and window to wall, unsuitable tapes & block work installed.

Q13: How are Passive Vents Treated?

A13: If the Passive vents which are installed in the building have an opening & closing mechanism (Hit & miss closer) they are to be closed for the test & **NOT** temporarily sealed. If the passive vents do not have an opening or closing mechanism they can be temporarily sealed for the test

Q14: When is the best time to do the airtightness test?

A14: The optimum time to do the test will be site specific, however all plant, fittings etc that impact on the air tight line must be completed and all dampers, vents, ironmongery etc completed. The nearer to project completion, the more likely all of the above will be in place. At least two weeks notice of the test should also be given to the design team and Clients.