Building Envelope FORUM

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# Specifying a Higher Standard for your Air Barrier
## A Program to provide Quality Assurance for the on-site application of Air Barrier Systems

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Part 1 in a 3 Part Series of Improving Quality and Building Durability

The importance of a working, effective air barrier system in buildings is well known and documented in the Canadian market. It is not hard to spot a building "in distress" in any city in Canada, as the effects of uncontrolled air leakage can become evident very quickly and can be shown by damage to the exterior facade or interior finish.

Figure 1: Does your air barrier consistently look like this? It should !

As the construction activity in the majority of Canada remains at high levels, a real concern has been expressed in regards to skilled trades in a variety of sectors. This, in combination with our lesson from the BC condo crisis and a real consensus within the industry that installation is just as import as design, or the quality of products chosen has brought a number of issues to the forefront.

### The Effects of Uncontrolled Air Leakage

An improper installation of an air barrier can lead to massive damage to the whole building envelope. In almost all cases, the air barrier system is installed within the wall and covered, making the repair or replacement of any portion of the system very expensive. Since the installation of this component is so important to the building envelope, how we are addressing the proper installation, both today and in the future are extremely important when trying to construct durable buildings, that will perform as intended.

What does an ineffective air barrier system do to the building? In short it can cause major damage, including structural. Air leaking through the building envelope carries with it water vapour. In cold climates, the water vapour is carried from within the building through holes in the building envelope as it exfiltrates. In warm climates, the water vapour is carried from the exterior through holes in the building envelope as it infiltrates. The water vapor then can condense within the building envelope.

This liquid water within the building envelope can corrode fasteners and structural members, damage and stain exterior and interior finishes, cause ice lensing, damage masonry, promote the growth of mold and mildew, reduce the thermal performance of the insulation, and reduce indoor air quality. As the potential damage is so great from a relatively small building component, the installation must be confirmed on site, prior to being covered.

Air Barrier systems continued on page 2

Air Barrier systems continued from page 1

Figure 2: Damage to Wood from moisture

Figure 3: Visible Signs of a Building Envelope in Distress from the Exterior

Nowadays, building owners, architects and engineers want to be assured that the air barrier system they have chosen will be working and effective at the time of installation, and for years to come. To be assured of this, the correct material must be used in the installation (multiple materials may need to be used in a single application due to the substrate or compatibility of other materials), the installation must be done correctly, and the correct installation procedure must be confirmed before being covered. There are different air barrier materials that can be used, and they can be tested fairly inexpensively to ensure that they provide the air barrier characteristics required. But they all share a common challenge.

The materials must be installed correctly, they must be continuous to other building envelope components, they all must adhere to the substrate, and they must properly seal at joints, junctions, gaps, cracks, and penetrations. The importance of a working and effective air barrier system lies in the installation of these components.

## The Solution

As such, the National Air Barrier Association, along with the American Air Barrier Association has implemented on-site Quality Assurance Programs for the installation of air barriers in wall assemblies.

The Air Barrier Quality Assurance Program is a program that has been developed to increase the level of installed quality and in-situ performance of air barrier systems in Canada and the United States. This provides a greater assurance to the building owner and design professional.

The Air Barrier Quality Assurance Program was developed by the bpc Building Professionals Consortium and was based upon the successes of other similar type programs that were previously developed by BPC. The program is based upon the principles of ISO 9002. In Manitoba, where the Air Barrier Quality Assurance Program was originally piloted, a large cross-section of industry provided input into the program.

Air Barrier systems continued on page 3

Air Barrier systems continued from page 2

These stakeholders consisted of trade contractors, general contractors, manufacturers, architects, engineers, building owners, utilities and consultants. After approximately 2 years of review and refinement by industry stakeholders the Air Barrier Quality Assurance Program was endorsed by NABA and launched in Manitoba.

This Quality Assurance Program consisted of a number of components, all working together, to raise the level of quality in the field.

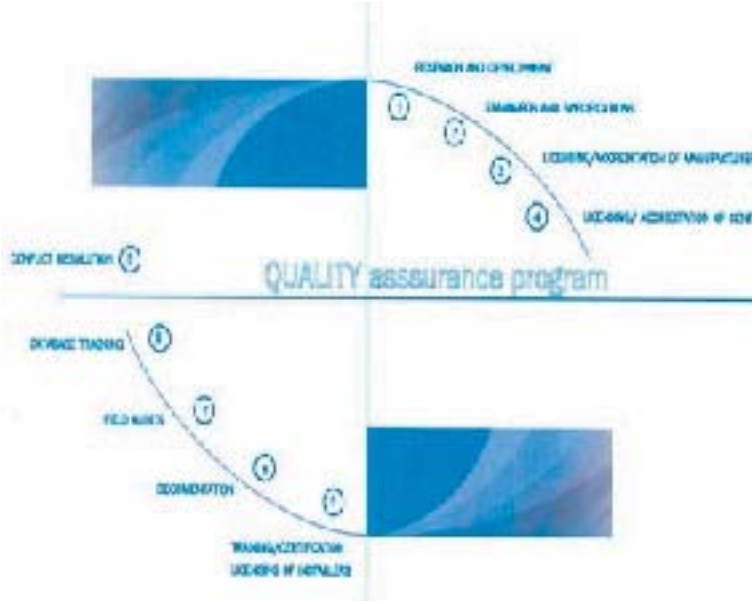


Figure 4: Quality Assurance Program Components

The Quality Assurance Program encompasses a variety of initiatives that include pre-qualification requirements of contractors and installers, training and education, a method for installers to self-test their work, a paper trail of the entire installation process, a independent auditor to conduct audits to confirm compliance to the QAP program and NABA specifications and a process to deal with the loss of license by an individual participating in the program. It also provides a mechanism for a designer or owner to initiate a complaint or concern.

The day-to-day management of the Quality Assurance Program is provided by the bpc Building Professionals Consortium, as a 3rd party organization This resolves issues with the credibility of the program by having the program run by an unbiased 3rd party organization. This therefore alleviated any concerns of “an old boys club”. Once the rules were set and published, all individuals would be required to meet the same standards and requirements.

The Air Barrier Quality Assurance Program is be continuously improved and updated on an on-going basis. Although the Air Barrier Quality Assurance Program participants have a direct input into making recommendations for changes to the Quality Assurance Program, it is only after a thorough review is performed by BPC, along with actual “users” of the program that changes are made and implemented. “Users” of the program consist of non-biased individuals such as architects, engineers, building owners or government agencies.

Again, this was put in place to ensure the program would be fair for all parties involved and have a value to the building owner and design professional. A Quality Assurance Program dictated simply by contractors involved in the association was not deemed to provide a program that may not take the interests of the building owners and design community to heart. The program has been developed for all parties involved, including architects, engineers, building owners, contractors and manufacturers. This balanced approach has proven successful, as all parties work together to ensure higher standards and quality.

Air Barrier systems continued on page 4

Air Barrier systems continued from page 3

So, how does one incorporate this sort of quality assurance into their project? And what are some of the details of the program in regards to qualifications, training and so forth. Well, stay tuned, as future articles will focus on how to incorporate quality into your air barrier system and more details of the “nuts and bolts” of the QAP program.

If you can’t wait, simply contact BPC for more information on the Air Barrier Quality Assurance Programs for either the Canadian or U.S. market at bpc@bpc.ca. Also, you may obtain further information on the respective association websites. www.naba.ca or www.airbarrier.org.

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About the Author

Ryan Dalgleish is the Vice-President of the bpc Building Professional Consortium. He has been involved in the building envelope and building performance areas of construction in both the commercial and residential sectors for 10 years. Much of Mr. Dalgleish’s time is spent on technology transfer and training and he has been a trainer, facilitator and project manager for 7 years in this area. Mr. Dalgleish also is involved in research, the development of training curriculum, and strategic planning for clients. Mr. Dalgleish’s background and education has given him strong skills in financial management, market development and planning and association administration.