



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

In the last article, we introduced site quality assurance programs for air barriers installations within wall assemblies for both the Canadian and U.S. markets. Both these programs are currently available for building owners and designers wishing to improve the quality of their air barrier installations. As voluntary programs, they only come into effect when specified in the contract documents for the air barrier sub-trade. There are no building code requirements, nor industry standards that will automatically provide the owner or designer with a form of quality assurance. In most instances, the extent of quality for the air barrier installation is left in the hands of the air barrier sub-contractor or general contractor. In reviewing training programs for this trade, for the most part, there was not a formal training program in place prior to the creation of the National Air Barrier Association and the American Air Barrier Association. That meant that installers of this critical component of the building envelope, it was a case of "learn as you go".

The Air Barrier Quality Assurance Program is designed to be 3 dimensional and not focus on just one or two mechanisms to increase the quality on the installation. The QAP program is also not tied to just increasing the quality on a particular job, but rather to increase the professionalism as a whole in the industry. For instance, if a particular project has full time 3rd party inspection, you can be assured that the project will be done right. For the most part, the cost of this become prohibitive and the quality is raised only on this project and does not then translate into increased quality on the next project where there may be no allowance for this type of service. When the program was developed, it took a holistic approach to how a number of mechanisms could simultaneously work together with constant improvement to not only improve the quality on a project that specified the QAP program, but to transform the industry and mind-set that ended up improving the overall quality of installations right across the industry.

As discussed in the last article, the Air Barrier Quality Assurance Program is made up of the following items:

- Contractor Licensing
- Installer Training and 3rd Party Certification
- Trade testing and inspection
- Documentation
- 3rd party auditing
- Conflict Resolution

So what happens when you specify the Air Barrier Quality Assurance Program in your project? How much will it increase the cost of the air barrier? Well, let's take a look at exactly what it means.

NABA licensed contractors will bid on the work.

You are assured of contractors that have the experience, know-how and track record of performing good work.



The design professional is not required to pre-qualify or try to determine who is qualified and who is not. NABA Licensed Contractors must meet minimum requirements for insurance, bonding, employ certified installers, possess the necessary equipment to install and test their work, be trained in the Quality Assurance Program and sign a licensing agreement dictating professional conduct and the right to terminate their license should they not meet the requirements of the program.

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Education and 3rd Party Certification for Air Barrier Installers

The installer of the air barrier has the single largest impact on the quality of the installation. With the Air Barrier QAP program, it is a requirement that a Certified Installer(s) will perform the installation and is on-site at all times. These installers have the experience and are trained in various air barrier system applications. Installers need a minimum 3000 hours of documented and verified work experience in order to qualify for certification. Installers are required to attend training a pass a written test with a minimum average of 80%. The installer is then required to have a practical assessment of his on-site application skills. Auditors or trainers observe the installer applying various types of air barrier materials and the installers must demonstrate sufficient skills to pass predetermined performance requirements.



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Certification is provided for various materials, but not all materials. If an installer has experience in self-adhered membranes, but has not ever installed torch applied membranes, the installer would only be certified in self-adhered. The certification is provided by a 3rd party certification organization in accordance with ISO INTERNATIONAL STANDARD ISO/IEG 17024:2003(E). Conformity assessment -General requirements for bodies operating certification of persons.

Each NABA specified project is required to have at least one Certified Installer on site, at all times. It is not a case of having a site foreman trained that is only on the site infrequently, if at all. Certification is provided to the actual individuals that are performing the work and they must be on-site at all times.

Trade Testing and Inspection

Certified Installers, on a daily basis, will perform 3 forms of testing on the application of air barrier materials. First of all, installers perform a visual inspection of the substrate prior to the application of membrane to confirm the substrate is in accordance with the manufacturer's instructions. The installer will then perform a visual inspection on the completed air barrier for that day and fix any deficiencies (things such as "fish mouths" on seams, unsealed penetrations, etc). The second test the installer performs is an adhesion test to determine the bond strength of the material and how well it is sticking to the wall.

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The installer performs at least one test on the area installed on that day. The third test the installer performs is an air leakage test in accordance with ASTM 1186 “Standard practices for Air Leakage site detection in building envelopes and Air Retarder Systems”. This test is conducted on penetrations, seams and laps through the air barrier assembly.



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Project Installation Documentation

The Certified Installer is required to document the entire installation process on “Daily Work Sheets”.

NABA
National Air Barrier Association

Job Site Report

Crew # ____ of ____
Job Site Report # ____
Date: ____

Lead Installer: _____
Certified Installer: _____
Registered Installer: _____
Registered Installer: _____

Certification #: _____
Certification #: _____
Registration #: _____
Registration #: _____

Project Information

Air Barrier Contractor: _____
Project Name: _____
Type of Air Barrier Installed: ☐ Torch Grade ☐ Self Adhered ☐ Spray-Applied ☐ Sheet Metal
AB Manufacturer _____ Product Name _____ Batch # _____
Primer Manufacturer _____ Product Name _____ Batch # _____
Substrate Type: _____ Substrate Temperature: ____ °C Ambient Temp: ____ °C
Substrate Surface Conditions and Preparation Required: _____

Substrate Conditions Acceptable for Application of Membrane: ☐ Yes ☐ No
Application done in accordance with plans and specifications ? ☐ Yes ☐ No

Installation & Testing Location

Location of Installation for 4 locations:

# 1 Time Started: Time Completed:	# 2 Time Started: Time Completed:
On Gridline	On Gridline
Between Gridline: to	Between Gridline: to
Between Elevation: to	Between Elevation: to
Wall location: North South East West	Wall location: North South East West

# 3 Time Started: Time Completed:	# 4 Time Started: Time Completed:
On Gridline	On Gridline
Between Gridline: to	Between Gridline: to
Between Elevation: to	Between Elevation: to
Wall location: North South East West	Wall location: North South East West

The “Daily Work Sheet” provides the following information: listing of installers, project name, type of air barrier installed, air barrier product name and lot/batch number, primer product name and lot/batch number, substrate type, substrate preparation required, installation locations (gridlines, elevations, etc), and test results of visual, adhesion and air leakage testing.

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For visual inspection, the installer identifies where he has visually inspected, how many deficiencies found and actions taken to correct the deficiencies. For adhesion testing, the installer records where the testing was completed, the testing result and whether the test pad let go from the membrane, or the membrane let go of the substrate. For air leakage testing, the installer records how many tests were conducted, how many deficiencies were found and the corrective action taken. The documentation is submitted to the NABA office on a bi-monthly basis for database tracking and review by the quality assurance administrators. This paperwork is also forwarded to the design professional upon request.

3rd Party Audits

On every project that is specified NABA, a NABA audit is conducted. The number of audits performed on a specific project is determined on the contract value of the project. For example, for projects with a value of less than \$50,000, one NABA audit is conducted. Other audits may be conducted due to non-compliance by the contractor or installer or if specified by the design professional. In all cases, the cost of the audit is the responsibility of the Licensed Contractor.

The scope of the NABA auditor is to confirm compliance to the Quality Assurance Program and manufacturer instructions. This includes confirming if the installer is meeting the manufacturer's instructions for substrate preparation, compatible materials, actual application and repair procedures.

The inspection process and inspectors are overseen by the Energy Conservation Contractors Warranty Corporation (CWC), which provides quality auditing management services for a number of associations and government departments. The NABA auditors are typically industry consultants, engineers, or inspection agencies. The first job of the inspector is to help the installer with any concerns.

The second job of the inspector is to document compliance to the Quality Assurance Program and manufacturers instructions. Once the audit is completed, it is forwarded to the CWC office for review, filing, assessment of demerit points (if applicable), and dissemination to the contractor, installer and other parties as deemed necessary.

Conflict Resolution

If there is a concern on a project by the design professional or owner, a dispute resolution system is in place to deal with any problems to make sure things are done right. NABA has in place a system for both complaints about Licensed Contractors and Installers and a system in place in the case where a Licensed Contractor or Installer wishes to appeal the assessment of demerit points or the loss of license. NABA will do its best to resolve any issues within its power.

What is the cost?

So, how much will incorporating a QAP program add to the bottom line. Well, not much, based on the value of the program! As the entire program is a voluntary program, the additional costs for incorporating the program in a project will be about 2.5 % of the air barrier contract value. For instance, if the cost to supply and install the air barrier is \$50,000, it would add \$1,250, as an estimate. This cost, for this case, would cover the cost of 1 audit and the management and administration fees of the program.

In the overall scope of a building envelope retrofit or a new building, this cost is very, very minimal. Where budgets do not allow for 3rd party inspection, this provides the most value for resources spent to provide a large upgrade to the quality of the installation. If budgets do allow for 3rd party inspection, this only increases the quality control on site and provides "two pairs of eyes" to ensure a proper installation.

What are the Benefit of the Program

The QAP program benefits everyone involved in the construction process. For any program to be effective, it needs to be balanced and benefit both from a design professionals view and also from the air barrier sub-contractors view. The benefits for the various parties include:

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Building Owners

- Level of comfort in the quality of workmanship of this critical and most often non-maintainable component
- Decrease the chance of high maintenance costs to repair or retrofit premature degradation of the building envelope
- Decrease in energy costs and long-term energy savings
- Decrease in chance for mold/mildew growth
- Better indoor air quality and occupant comfort
- Support system in place to address concerns

Design Professionals

- Pre-qualified quality contractors
- Level of comfort in quality of installation
- Trained and educated installers working on-site (not in the office!)
- Reduction in liability and risk management
- Provide the best for their clients
- Documented installation records
- Reduced site time
- Assistance with problems and conflict

Manufacturers

- Correct installation of their products
- Training system in place for their products and systems
- Reduction in call-backs
- Reduced site time
- “Real Life” feedback on field installations

Air Barrier Contractor

- Level playing field for industry
- Reduction in possible call backs
- Education and technology transfer to actual installers
- Able to perform quality workmanship
- Market advantage to non-qualified contractors
- Processes in place for ISO 9000 registration

As you can see the Quality Assurance Program is intended to raise the professionalism of the industry and benefit all parties involved. It takes a holistic approach to long-term quality and raising the standards within the industry. Guide specifications are available through the National Air Barrier Association (NABA) that provides the specification language needed to have your project incorporate the air barrier QAP. Also, the Air Barrier Association of America (ABAA) also has a number of guide specifications that provide QAP type language. Both sites offer downloaded and editable specifications.

For more information on the Air Barrier Quality Assurance Program, please feel free to contact writer at the bpc Building Professionals Consortium or the respective trade associations.

National Air Barrier Association: Toll Free: 866-268-6222 or email naba@naba.ca web: www.naba.ca
Air Barrier Association of American: Toll Free: 866-956-5888 or email abaa@airbarrier.org web: 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.