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Is it Just Me, Or Does Every Building Leak?

By David Leslie, RWC, CSI



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I was asked to write this article in August, when I had just finished presenting “Design, Material & Installation: The Three Facets for an Integrated Weather Barrier” at the Austin Chapter of the Building Enclosure Council (BEC).

The audience’s reaction at this August presentation was overwhelmingly positive; there was an enthusiastic response which prompted the request to write this article. After the presentation, I was asked the question, “How do we change the industry?” This question became the driving factor of this article.

I am very passionate about the building envelope industry; my goal has always been to improve our industry and to give insight into why buildings leak. Environmental intrusions from air, thermal, and water leaks are the major reason a building has unusable space. In my research, I discovered 90% of litigation with architects involves building leaks. Additionally, building leaks are the number one problem for general contractors when closing out a project, and the primary reason for specialty subcontractors being called back.

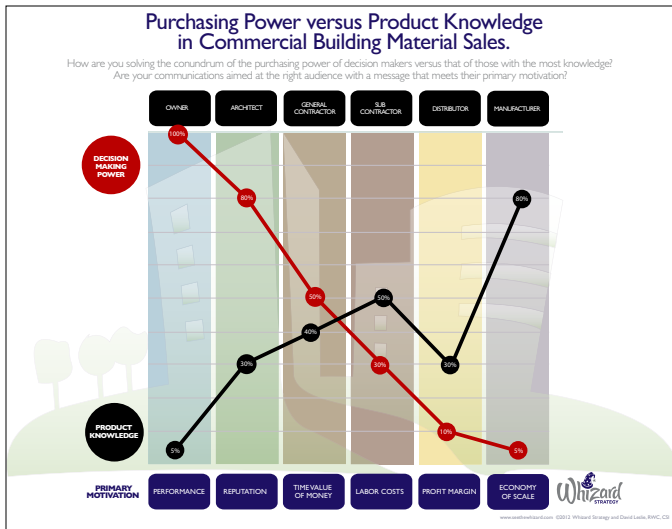
Consequently, the greatest source of liability for building weather barrier system manufacturers is, again, building leaks. And, as technological advances increase the complexity of design and construction, building leaks are becoming harder to prevent. To address this problem, the American Institute of Architects (AIA) started the Building Enclosure Council, RCI,

Inc. has developed a Registered Building Envelope Consultant classification, and continuous air, weather barriers, and other building envelope ASTM standards are being written into all building codes. This is a clear indication that many people are asking that same question: “How do we change the industry?”

The person who asked that pivotal question at the aforementioned BEC presentation was John Posenecker of Chamberlin Roofing & Waterproofing in Austin. We have been friends for years and frequently discuss how to improve our industry. But his query hit close to home, because it begs the question: What good is a consultant if he tells you what the problem is but doesn’t tell you how to fix it?

In the presentation, I defined five primary objectives to create an integrated weather barrier (i.e. buildings that don’t leak). But these processes don’t have the breadth or width to impact the industry because they are simply tasks. In order to change the industry, there has to be a universal vision and a consistent message that leak-free buildings are attainable. And to succeed, this vision and message must be relevant to the stakeholders involved in constructing buildings.

In order to focus the vision and define the message, the Purchasing Power vs. Product Knowledge graphic I used in my presentation. This graphic is a powerful tool that creates insights into our industry’s purchasing chain and the mechanisms of building construction.

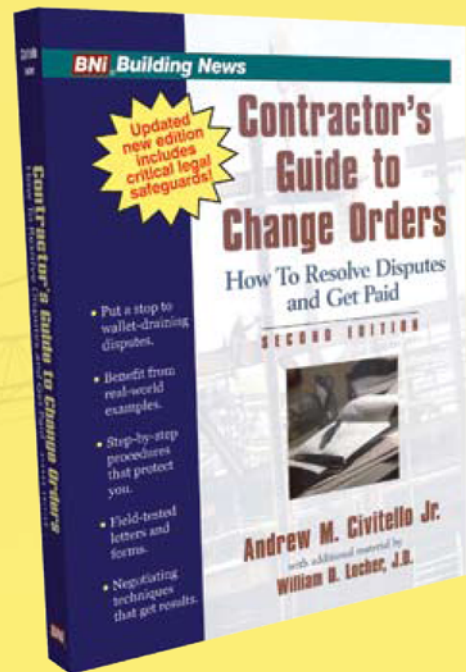


I have 25 years in the roofing and waterproofing industry and have been blessed with a wide array of life experiences, including majoring in baseball in college. Being an athlete teaches us many valuable things, but a lesson that has served me well beyond sports is that having good fundamentals are key to reaching maximum performance; and understanding those fundamentals is critical to knowing how to improve. Before we can develop a vision and a message to change the industry, we must first agree upon the fundamentals of constructing buildings that perform as intended. Following are the universal fundamentals that I believe are key to achieving those results:

- The primary reason to construct a building is to provide shelter for human activity. During construction, it's easy to make critical mistakes relating to a building's weather barrier systems when this concept is forgotten. The building's primary purpose is to keep the outside environment out and the inside environment in.
- Because the building's primary purpose is shelter, it has to be viewed as a whole and not just a sum of its parts. The reality is that 90% of all environmental intrusion occurs in less than 1% of the building surface – consisting of terminations, penetrations and transitions for the weather barrier systems. Leaks occur where one weather barrier system stops and another one begins. For any building to perform as intended and to be leak-free, all of the weather barrier systems have to function together to create an integrated weather barrier.
- Creating an integrated weather barrier does not happen by chance, it has to be planned. Regardless of what is being constructed, there are three facets to the process: design (the prescribed plans for moving an idea from vision to tangible), material (the physical products chosen to move the vision from tangible to reality), and installation (the process of assembling the materials to bring the vision to fruition). These components are intimately intertwined, inseparable, and interdependent. A flaw in any one of them can result in poor performance; a flaw in all three will cause significant failure. Design, material, and installation are a prism. Through this lens we can project an image of how to construct buildings that are leak-free and view ways to correct existing buildings that are not.

Now the question is: If we know these fundamentals, then why do buildings leak, and how do they relate to the Purchasing Power vs. Product Knowledge graphic? To better understand how the graphic functions and relates to the three fundamentals,

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it is helpful to know why the graphic was developed.

Some years ago, while working as the Technical Services Manager for a building weather barrier material manufacturer, I was holding a training class for some newly-hired employees. During the class I posed the question: "Who is our customer?" Someone in the class responded, "The contractor."

My reply was, "That answer is the very reason that our industry has a poor reputation and why buildings leak." Ultimately, the customer for everyone involved in constructing buildings is the building owner. To illustrate the concept, I wrote on the white board what I called the "Purchasing Chain."

The purchasing chain reflects the sequence for constructing the building. This is where the three fundamentals come into play. The general chronological process of actual construction is:

1. Owner hires an architect to design a building
2. Architect's design documents are issued for bid from general contractors
3. General contractor selects specialty contractors who purchase the weather barrier manufacturer's products from a distributor

When this sequence is viewed in relationship to the Purchasing Power vs. Product Knowledge graphic, it becomes obvious that the reverse relationship with power and knowledge carries throughout the entire graphic.

Because design, material, and installation is intertwined, inseparable, and interdependent for constructing leak-free buildings, the fact that an architect is designing a building with only 30% product knowledge creates significant opportunity for flaws in the weather barrier systems. Groups to the right of the general contractor virtually never have direct dealings with the owner, so it's easy for them to forget they're working for the building owner. I then expanded this concept by plotting the points for the Purchasing Power and Product Knowledge graph. What I found is that the person with the most power has the least knowledge, and the person with the most knowledge has the least power.

This is not to say that all issues belong to the architect – nothing could be further from the truth. There is no way for the architect to have knowledge of all the available weather barrier products, and the architect

is not actually installing the products. Many of the critical details of the termination, penetrations and transitions (where 90% of all leaks occur) are the purview of the General Contractor through shop drawings from the specialty subcontractor and during actual construction. There was an era when this process was practical, because the General Contractor had many of the specialty subs in-house, and everyone involved understood that they were constructing the building as a whole. But now, the purpose is to optimize production by everyone becoming a specialist, so the current business model is for the General Contractor to function as a project administrator, utilizing specialty subcontractors who have a narrow focus of a single discipline, such as roofing.

Unfortunately, specialization – the very thing that has helped us advance as a society – has become a hindrance to constructing leak-proof buildings. Few people know how to install terminations, penetrations and transitions properly; fewer manufacturers make compatible products, and even fewer people know how to design buildings so they don't leak. And virtually no one takes responsibility.

Because of this, the final decisions for building construction usually fall on the shoulders of the General Contractor, who has 50% of the Purchasing Power and 40% of Product Knowledge.

Credit for professional appearance of the Purchasing Power vs. Product Knowledge goes to a friend, Mark Mitchell, and his talented graphics department at Whizard Strategy (www.seethewhizard.com). Mark used my graphic as the centerpiece for a chapter in his book *Building Material Channel Marketing* and illustrates how Purchasing Power vs. Product Knowledge can help guide your marketing to be more effective. The same core principle found in the graphic that makes product placement messaging effective is also applicable to positively change our industry.

For true change to be accepted and sustainable, it has to be beneficial to all of the stakeholders; but even more important, it has to be practical for everyone. An integrated weather barrier producing a leak-free building obviously would be beneficial for everyone, but if the process does not provide value for any one stakeholder, it will not be followed. Regardless of who you are, value is only created by a combination of three things: wants, needs and budget. When I say there is no good reason for buildings to leak, I mean exactly that, no good reason. The design, material and installation processes to produce an

Integrated Weather Barrier all currently exist, and would not require any additional cost.

In order for the construction industry to consistently produce leak-free buildings, we require a paradigm shift, with all of the stakeholders participating.

The industry is not doomed to produce leaky buildings. The work-around is to have a dedicated person working outside of the current process, functioning as the integrator from the very inception of the building until its completion; and any one of the stakeholders could step up to the role of integrator.

That brings us back to the question, "How do we change the industry?" It's easy: Remember that we construct buildings to keep the outside out and the inside in. Just as there needs to be a vision to bring the weather barrier components to work as a single unit, there also needs to be a vision and a plan to unify stakeholders to construct buildings as a whole.

David Leslie, Building Weather Barrier System Consultant, Building Exterior Solutions, LLC, has been involved every aspect of the roofing and waterproofing industries for the past 25 years, creating a unique perspective and awareness in the design, material and installation of building envelope systems. These experiences include building envelope consulting (new and restoration projects), four patent applications for building envelope systems and products, the development and production of building envelope products for various manufacturers, and as project superintendent of the installation for major roofing and waterproofing projects nationwide. He focuses on positively changing the Building Envelope industry today and into the future by providing clients with a sustainable Integrated Weather Barrier. You can reach David at dleslie@besgrp.com or 469-449-3393.



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