Built To Last: Rethinking Structural Penetrations
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Explore the critical role of structural penetrations in compromising the waterproofing integrity of building envelopes—highlighting how each penetration creates a potential failure point. Given that envelope defects account for approximately 70 % of construction litigation and nearly 29 % of insurance claims involve water damage, the importance of reliable detailing cannot be overstated. Traditional methods rely heavily on sealants and caulking, which are prone to degradation from UV exposure, thermal movement, and vibration, contributing to over $4 billion annually in remedial costs. The tragic collapse of Champlain Towers South serves as a stark reminder of the consequences: water infiltration, particularly around penetrations, can severely damage structural elements in under three years, while post-installed sealants alone cannot provide long-term protection. We will critique outdated waterproofing techniques—such as pitch pockets and post-installed seals—and advocates instead for port-based mounting systems that decouple structural attachment from waterproofing. These systems are engineered to maintain envelope integrity by providing built-in waterproofing, increased load capacity, and reduced reliance on degrading sealants. Compatible with both new construction and retrofits, they preserve thermal performance, lower maintenance burdens, and mitigate long-term liability. Delivered as an AIA-accredited program, the course also offers ongoing architectural support through Q&A sessions, detailing reviews, and further educational events—bridging the gap between design theory and construction reality. Port-based mounting systems are an innovative solution designed to address the dual challenges of structural support and waterproofing in building construction. Unlike traditional methods that rely on patchwork solutions like caulk and sealants, port-based systems integrate waterproofing directly into the connection detail, eliminating the need for membrane punctures and reducing long-term risks.



Lance Nill – Founder & Inventor, Nill Building Solutions
With over 35 years' experience in construction and waterproofing. Lance Nill has built a reputation as a visionary problem solver in the building envelope industry.
As the founder of Nill Building Solutions, Lance pioneered patented attachment systems that eliminate one of the most persistent threats to structural integrity: water infiltration. His inventions deliver lower maintenance, increased load capacity, and complete waterproofing—setting a new standard for durability and performance in modern construction. Lance's career began with a deep focus on copper work and roofing, where his craftmanship can be seen on landmark projects throughout the East End of Long Island. His hands-on expertise and relentless pursuit of better building practices led him to develop the breakthrough fastener and mounting technologies now used in architectural, residential, and commercial applications nationwide.
A third-generation builder, Lance is dedicated to advancing construction standards while preserving the legacy of quality craftsmanship. Today, he continues to lead research, testing, and development of new solutions that empower architects, engineers, and contractors to design with confidence—knowing their structures are protected from elements at the source.