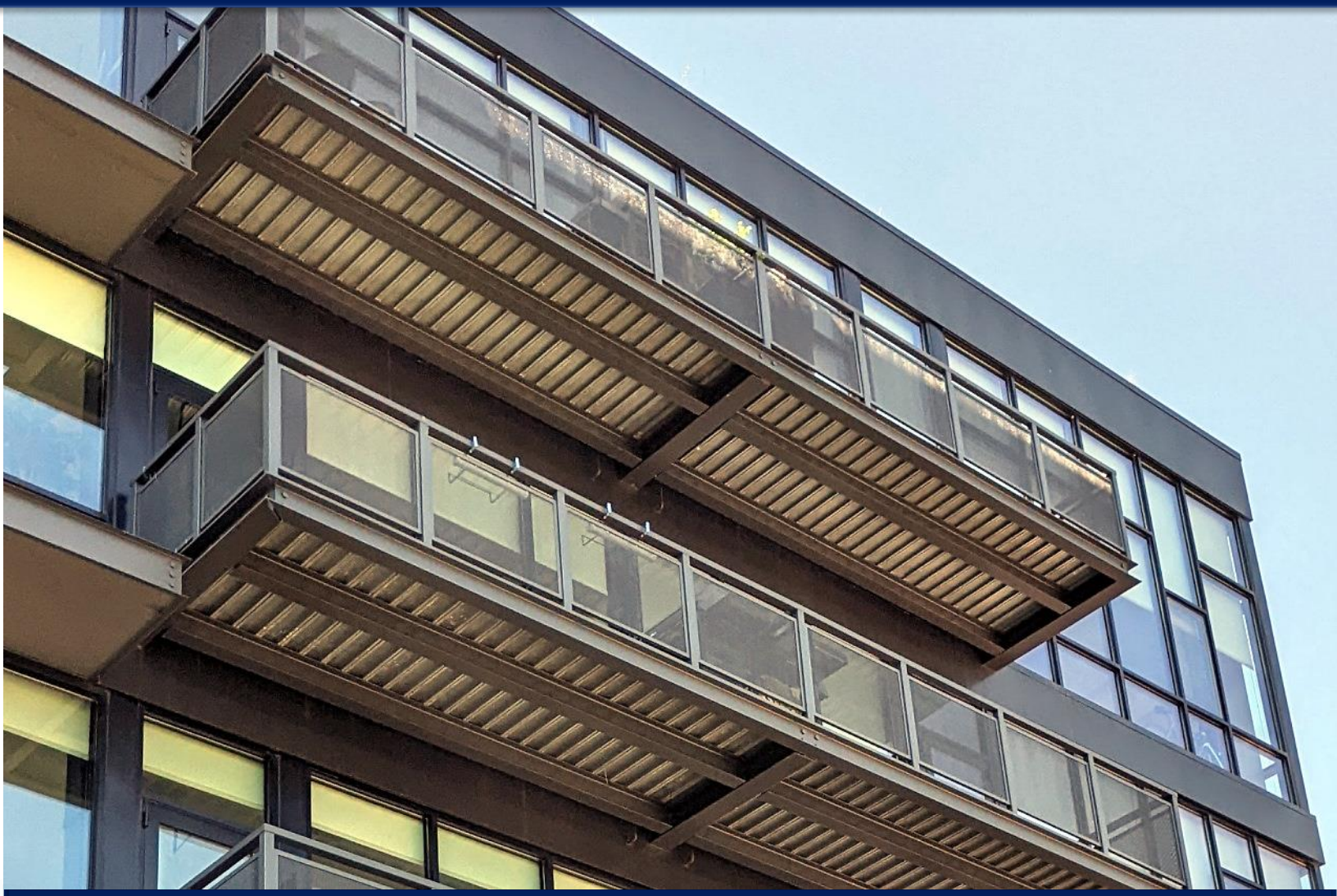
Case Study | March 20, 2025



LEAK INVESTIGATION

A Study in Precision, Persistence, and Results

Leak Investigation: A Case Study

Leak Investigation at a Non-Specific Mid-Rise Residential Building

Project Background

A mid-rise residential building in the Midwest, constructed with a typical 2010s-era envelope approach, suffered from persistent water infiltration for years. Storm after storm, residents and commercial tenants reported ceiling stains, moisture damage, and warped flooring—clear signs of a deeper, unresolved issue.

Multiple repair attempts had failed. Contractors applied localized fixes that provided temporary relief but didn't resolve the underlying issue, while consultants produced surface-level reports that identified concerns and described the building but stopped short of pinpointing definitive failure points.

The building featured a storefront framing system used in a window wall capacity, a common "value engineering" approach that has led to performance challenges in similar buildings nationwide. The framed wall portions were clad with brick and metal panels, and the repeated water intrusion incidents left owners struggling to find a solution that wasn't just another temporary fix.


Failure Strata of Previous Surface-Level Remediation Attempts

Initial Efforts, Rising Costs, and No Resolution in Sight

After multiple contractor-driven attempts to resolve the issue with surface-level sealant repairs, the building owners sought a more comprehensive assessment and engaged a building envelope consultant for an expert opinion. The consultant's report was exhaustive in length but lacked any definitive failure point identification necessary for effective remediation.

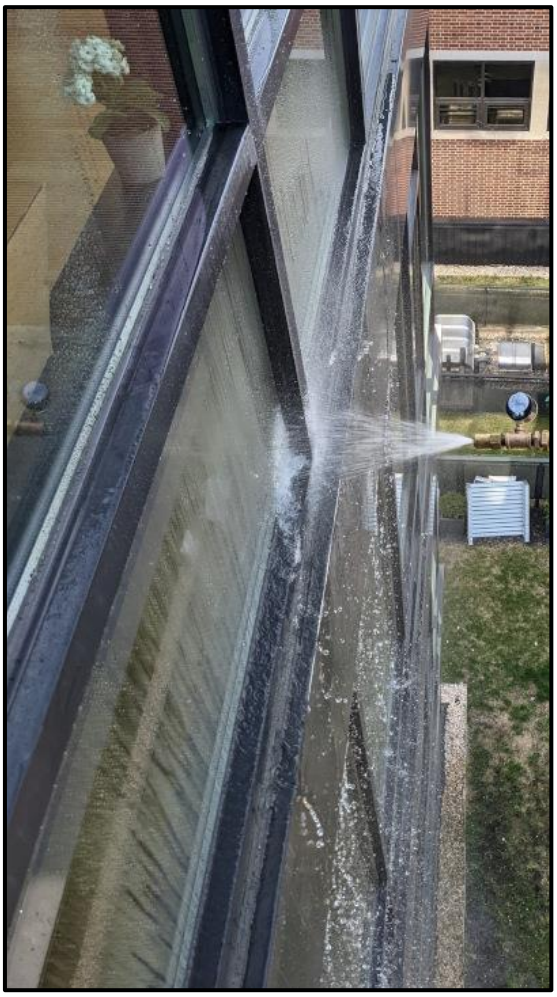
Another partial effort. Without clear diagnostic certainty, the owners faced continued uncertainty, persistent water intrusion, mounting expenses, and no actionable path forward. The complexity of the deficiencies had stymied all previous attempts at resolution, requiring a more targeted and structured approach.

Why Hightower Labs? A More Definitive Approach

After every storm, occupants faced new signs of water damage, and owners struggled with growing frustration—no solution in sight. Recognizing that previous attempts had failed to deliver clear answers, they turned to Hightower Labs for definitive expertise.

- **Definitive Findings** – We don't rely on speculation; our forensic approach pinpoints exact failure mechanisms, eliminating guesswork.
- **Non-Destructive, Occupant-Friendly Testing** – Whenever feasible, we deploy advanced diagnostic methods that minimize disruption while delivering conclusive results.
- **Proven, Systematic Methodology** – With thousands of hours of leak investigation experience, we refine every step of our process to ensure accuracy, efficiency, and reliable outcomes.

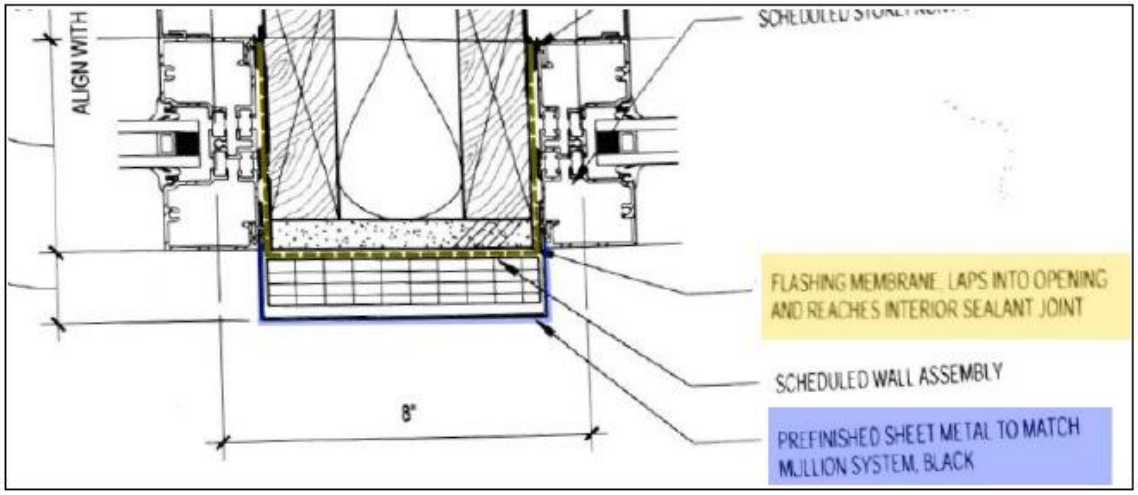
How Our Process Stands Apart



- **Targeted forensic testing** using controlled exposure and meticulous analysis to isolate leak sources across multiple failure pathways. Our structured approach allows us to trace water migration through complex, interconnected building components, ensuring no critical weakness is overlooked. Our methods are designed to isolate leak sources with a high degree of certainty.
- **Detailed system assessments** to establish where performance deficiencies exist.
- **Review of design documents, shop drawings, and past investigative reports** to connect observed failures with construction methodologies and design intent.
- **Non-destructive testing methods**, when feasible, allow us to assess failure points without adding the cost burden of demolition and replacement.
- **Concise, legally defensible reporting** with clear, actionable solutions.

Our report pinpointed the exact locations and mechanisms of failure, providing the client with an accessible understanding of the issues and providing a clear, foundational basis for remediation efforts.

We don’t just investigate leaks—we deliver clear, actionable narratives that pinpoint deficiencies and provide a definitive path to resolution.



Findings: Why the Building Was Leaking

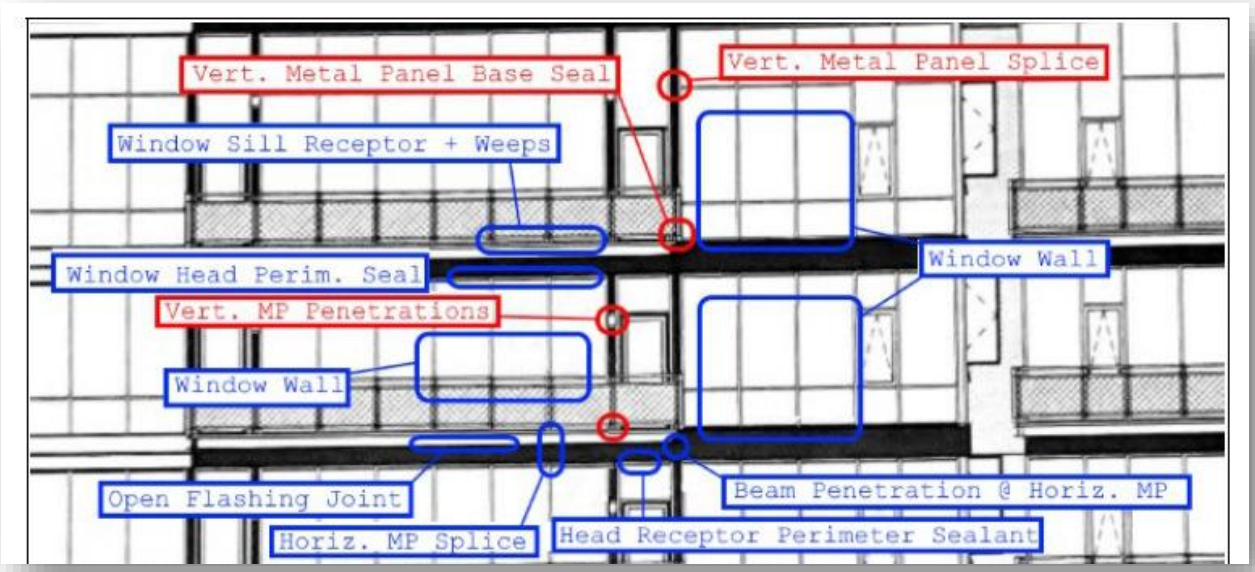
- **Subsill Flashing Deficiency** – The existing flashing below the storefront framing failed to function as a true barrier, allowing water to migrate into the structure—a common failure mode for this envelope design.

- **Backup Wall Membrane Breakdown** – Highlighted in yellow above, the weather-resistant membrane behind the metal panel cladding had failed, compromising its role as the primary barrier within the envelope system. Without a functional water-resistive barrier, water that breached the outer cladding had a direct migration path into subfloors, walls, and ceilings.

  Primary Issue: The primary WRB membrane was compromised, offering no protection.
  Impact: Water freely migrated into subfloors, walls, and ceilings, accelerating damage.

  The primary barrier weather resistant membrane coating the framed wall behind the metal panel cladding no longer functioned as a primary water barrier. Consequently, the metal panel and adjacent fenestration systems were required to function in a surface barrier role, unable to properly manage water in a rainscreen/drainage capacity. Any water that breached the outermost visible planes of these systems would access a failed membrane providing direct ingress into subfloor, wall assemblies, and ceiling cavities below.

- **Sealant & Penetration Deficiencies** – The primary barrier had failed, forcing weatherseal sealants to act as a critical (rather than secondary) first-line defense. Unsealed fixture penetrations, open splice joints, and failing sealants all contributed to uncontrolled water entry challenging the deteriorating primary barrier nearly every time it rained.



Why Hightower Labs Delivers True Value

Turning Complex Issues into Clear, Actionable Steps
Leak paths in modern facades can be intricate. Our analysis removes ambiguity, giving owners a clear, prioritized remediation strategy. Eliminate uncertainty. Implement real solutions.

Remediation Strategies That Maximize ROI
We don't just identify leaks—we provide targeted solutions based on cost, longevity, and feasibility, helping clients make informed decisions.

Precision Over Panic: Focused Repairs Instead of Costly Overhauls
Unlike generic recommendations that suggest full-system replacements, our targeted diagnostics prevent unnecessary spending on solutions that don't address the actual issue.

Investigations That Lead to Real Solutions
No vague theories. No wasted time. No unnecessary costs. Every investigation we've conducted has resulted in definitive, actionable findings—ensuring clients can move forward with confidence.

The Outcome: A Leak-Free Future

- Hightower Labs' root-cause findings were addressed by a contractor. Even with client-directed non-destructive investigation limitations, we ensured maximum accuracy without unnecessary demolition or cost burden.
- Since remediation was implemented in 2022, the leaks have not returned.
- The owners now have full confidence in their building envelope.

Conclusion: Hightower Labs is the Trusted Choice in Leak Investigation & Resolution

Water infiltration can drain a building's value, disrupt operations, and frustrate tenants. When time, money, and reputation are at stake, there's no room for uncertainty.

Modern building envelopes, and deteriorating older building envelopes, can have complex water management designs and extensive paths through which water can migrate. Many water penetration issues require true root-cause analysis and remediation – surface-level fixes are often money wasted.

- Hightower Labs delivers thorough, results-driven forensic investigations.
- No unnecessary costs. No delays. Just clarity, action, and results.

Persistent leaks lead to ongoing costs, operational disruptions, and long-term risks. **Don't settle for temporary fixes—get a thorough, data-backed solution that prevents future failures.**

- Minimize maintenance costs.
- Prevent further damage.
- Protect your property's long-term value.

Contact us today

For expert leak investigation & building envelope consulting, reach out to us:

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