

Winter Conditions and Building Facilities



Why Post-Winter Assessments Are Critical for Commercial Facilities

This winter's sustained freezing temperatures placed significant stress on commercial building systems. While facilities may appear unaffected on the surface, extended cold can create hidden damage that only becomes visible when temperatures rise and systems return to normal operating conditions.

Unlike sudden storm events, winter-related issues often develop gradually. Small vulnerabilities in roofing, plumbing, and building envelopes can allow moisture to enter systems and remain undetected until spring. For facility managers and commercial property owners, conducting a structured post-winter inspection helps identify these issues early and prevent larger restoration events.

Prolonged exposure to freezing temperatures can affect multiple building systems, including roofing assemblies, plumbing and sprinkler lines, mechanical equipment, and interior building materials. Addressing these risks early helps maintain operational continuity, avoid costly repairs, and extend the life of critical building infrastructure.

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Roofing Systems and Drainage Infrastructure

Roofing systems are among the most vulnerable components of commercial buildings during extended winter conditions. Snow accumulation and ice buildup place sustained loads on roof structures, while freeze-thaw activity within drainage systems can create blockages and structural stress.

Even when leaks are not immediately visible, water may migrate beneath roofing membranes, flashings, and penetrations. High-risk areas such as mechanical curbs, parapets, roof edges, and drainage points are particularly susceptible to hidden infiltration.

Key risks include:-

Delayed roof leaks

Water infiltration may remain concealed until snow and ice melt, often appearing later as interior leaks that are mistaken for spring rainfall damage.

Saturated insulation

Moisture trapped within roofing assemblies reduces thermal performance, increases energy costs, and compromises overall building efficiency.

Compromised flashing and sealant systems

Small failures in flashing or sealant joints allow water to migrate deeper into the building envelope and surrounding materials.

Facility managers should inspect roof membranes, flashings, and drainage components carefully. Internal roof drains, scuppers, and gutters should be cleared of debris and tested to ensure proper performance. Roof-mounted equipment such as HVAC units should also be checked for damaged seals or compromised connections.

Plumbing, Sprinkler, and Mechanical

Extended freezing temperatures can affect plumbing and mechanical systems even when no visible damage occurs.

Pipes exposed to extreme cold may develop:

- micro-fractures
- joint separation
- weakened seals
- pressure inconsistencies

Key areas to inspect include domestic water lines in exterior walls, sprinkler systems exposed to temperature swings, and mechanical rooms near exterior walls or loading docks.

Inspection and testing can help detect slow leaks, corrosion, or pressure changes that indicate hidden winter damage.

Building Envelope and Moisture Migration

The building envelope plays a critical role in maintaining energy efficiency and protecting interior spaces from external conditions. During prolonged cold weather, pressure differentials, air infiltration patterns, and condensation behavior can shift, allowing moisture to accumulate within wall assemblies and ceiling cavities.

Over time, these conditions can lead to several issues.

Insulation degradation

Moisture intrusion reduces insulation effectiveness, increasing energy consumption and operational costs.

Corrosion of structural components

Fasteners, framing members, and metal elements within the building envelope may deteriorate when exposed to persistent moisture.

Microbial growth

Trapped moisture can create conditions conducive to mold and mildew growth, potentially affecting indoor air quality.

Facility managers should inspect exterior walls, facades, and transitions for cracks, failed sealants, or openings. Testing for air infiltration or pressure imbalances can also help identify compromised areas of the building envelope.



Interior Impacts and Latent Moisture Conditions

Winter conditions can introduce moisture into concealed interior spaces without triggering immediate warning signs. Minor breaches in roofing or plumbing systems, combined with condensation caused by temperature fluctuations, can allow water intrusion to develop gradually over time.

Indicators of potential issues include:

- Discoloration or deformation in ceiling tiles, drywall, or interior finishes
- Persistent musty odors in mechanical rooms or enclosed areas
- Localized humidity increases within wall or ceiling cavities

Facility managers should conduct thorough inspections of ceiling cavities, wall assemblies, and utility chases. Moisture detection tools and infrared imaging can help identify hidden water intrusion before it leads to structural damage or mold remediation.

Restoration Perspective: Addressing Issues Early

From a restoration standpoint, early intervention is one of the most effective ways to minimize the impact of winter-related damage. Moisture introduced during winter months often remains trapped within building systems until warmer conditions allow it to migrate or evaporate.

Addressing these issues early helps prevent:

Mold amplification:

Moisture creates ideal conditions for mold growth, that can spread quickly through concealed areas

Material degradation:

Prolonged exposure to moisture can weaken structural components, insulation and interior finishes.



Extended drying and reconstruction timelines:

Delayed action often results in more complex and time-consuming restoration efforts.

Occupant disruption and liability exposure:

Water damage and mold can impact indoor air quality, disrupt operations, and create potential liability risks for building owners.

Post-Winter Actions for Commercial Facilities

As winter gives way to spring, commercial facility managers should conduct a post-winter building inspection to identify hidden damage caused by freezing temperatures, snow accumulation, and moisture intrusion.

Start with the essentials:

Roofing systems: Inspect membranes, flashings, and drainage for signs of leaks or damage.

Plumbing and sprinkler systems: Test for leaks, pressure issues, and weakened fittings.

Building envelope: Look for cracks, failed sealants, or moisture intrusion.

Interior spaces: Investigate concealed areas for discoloration, odors or elevated humidity.

If your post-winter assessment uncovers damage, the PBI team provides specialized restoration, repair, and maintenance services to help ensure your building systems remain safe, operational, and ready for the seasons ahead. Contact us today to discuss how we can support your facility's needs.



Baltimore County Fire Dept. Case Study



Biohazard Remediation for Baltimore County Firehouses

Client: Baltimore County Firehouses

Project: Biohazard Remediation

Timeline: December 3–23, 2025

Scope: 28 Properties

Average square ft per facility: 12,000

Overview

In December 2025, PBI was selected to provide urgent biohazard remediation for 28 Baltimore County firehouses, ensuring safety in high-traffic and shared spaces.

Challenges

The firehouses remained operational, requiring PBI to work around crews without disruption. Each site's unique layout and the tight 20-day timeline added complexity.

Approach

PBI mobilized within 24 hours, implemented a rolling schedule to ensure efficiency, and collaborated with county staff and Station Commanders to adapt to each site while maintaining industry-standard cleaning protocols.

Results

All 28 firehouses were remediated on time with zero disruption to emergency response operations. The coordinated approach ensured efficient communications, operational continuity, and high quality remediation across all locations.

Outcome

The work restored safe conditions for firefighters while allowing all facilities to continue normal operations without disruption.