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Building strategies to prevent water intrusion

Taking the proper time to put simple and often inexpensive water mitigation processes in place during pre-construction, construction and post-construction can help save your company from the headache and expense of water infiltration, damage and restoration.

Water intrusion into a building, manufacturing plant, construction site or hotel or residential complex can come from numerous sources. The most common include:

- Roof leaks and condensation forming above ceilings
- Broken pipes
- Sewer line back-ups
- Outside flooding
- Moisture between the interior and exterior part of the building (floors, walls, roofs and doors)

Avoid a "water, water everywhere!" call in your commercial building.

The good news is that strategies to prevent water intrusion from either exterior precipitation or interior plumbing systems are not necessarily expensive, and more a matter of careful planning and regular inspections.

Putting proper water mitigation processes in place during construction and maintaining them during a building's operational lifespan can help prevent significant, costly damage and refurbishment following a water-release event.

The "war on water"

Any commercial building needs to wage a "war on water" – creating effective strategies and tactics to keep away sources of moisture, including groundwater, water table, floodwater, seepage, storm water, utilities, sewers, snow/ice melt and runoff or discharge from adjacent properties.

To minimize damage, it is important for organizations to develop a moisture-control plan taking into account site logistics and storm water control. Plans should focus on addressing a building's exterior envelope detail, particularly during the construction phase and throughout the working life of the building. Having a plan in place for proactive moisture control helps reduce the risks of water intrusion into the building and aids in controlling moisture inside the building and in surrounding areas. Any water intrusion plan should address a building's entire life cycle – before, during and after construction.

Make planning a priority

Even before ground is broken for a building, the members of the project team should investigate any characteristics of the site that could become potential sources of water intrusion. One focus should be on identifying likely rainfall frequency and volume for the location likely to occur during construction and ongoing building operations.

Factors to consider include water sources on or around the site, such as sewers, utilities and the local contours of land around a building.

- Will water be able to run off during a storm?
- Are area retention ponds adequate for the exposure?
- Have other buildings in the area experienced water infiltration problems?

No matter how old a building may be, construction defects and workmanship problems can manifest themselves at any time. Beyond the damage to the physical property, the safety and lives of occupants and the integrity of expensive business equipment and technology could be at risk should a breach in the building envelope or faulty interior plumbing cause a rapid incursion of water.

To minimize the risk of water intrusion long-term, the original designers and building contractors should consider providing instructions to property owners and managers on proper maintenance and operation of the structure. The instructions should also recommend asking manufacturers to inspect the facility and contents periodically for warranty purposes.

When prevention goes amok

No matter how attentive the owners and occupants of a building may be, the unexpected can and does occur. The best practice for planning a rapid response to water intrusions is to have necessary materials easily accessible. Response kits should include items such as electrical cords, a multi-head ground fault circuit interrupter (GFCI), a wet/dry pump vacuum, a puddle pump, rubber boots, a hose, a squeegee, a pipe wrench to close valves, a broom, a bucket and, in some cases, a fire sprinkler shut-off device.

Developing plans focused on discovering and addressing damage sooner rather than later is critical. The later the discovery of a water intrusion, the greater the impact on the construction schedule and the greater the likelihood that repair costs will incur.

Consider these costly scenarios:

An improperly installed soap dispenser falls onto a lever-style faucet, causing water to run over the weekend, flooding three floors below and resulting in $350,000 in damage.

Rainwater enters an 11-story building through a broken roof drainpipe and unprotected window openings. The water runs throughout the building via elevator shafts, causing $200,000 in damage.

Workers carrying a large ladder inadvertently knock off sprinkler heads that were already hooked up and a shut-off isn't available, causing thousands of dollars of damage.

Pre-construction
Get it right from the start

The most effective way to combat water intrusion at a construction site is to be proactive about water intrusion risks even before ground is broken, and take measures prior to construction and during the building process to minimize water damage. Whenever possible, construction should be scheduled to avoid peak periods of expected rainfall. Potential sources of water intrusion should be identified and plans developed to control each one. Consider hiring a hydrologist to evaluate the local water table and ways to direct flow away from the structure using perimeter drains. Create a daily inspection report to check for damage, leaks or intrusion. Immediately alert the architect/owner of any design features that may allow water intrusion. Be sure that the project schedule will allow for completion of the building envelope prior to installation of finishes. Schedule completion of site drainage, paving and landscaping as early as possible.

Post-construction
Keep profits high and dry

All buildings are at risk for water damage and intrusion, especially in times of severe weather. It is important to maintain all of the exterior facing elements – roofs, walls, doors and windows. Make sure you properly seal everything each year. On a monthly basis, you should check the plumbing and drainage systems, the sump pumps and basement area if applicable, and all downspouts on the exterior of the building. Be sure to investigate any standing water in or around the premise. If the building has a basement, be sure to check the walls for cracks on a quarterly basis. And lastly, put a Water Emergency Response Plan in place that includes information on shutting down the water supply lines, electrical and gas supply lines, as appropriate, and a listing of all emergency phone numbers (fire, police, HVAC and plumbing specialists, employees, residents, etc.). Prevention and a well-maintained building are critical elements to any water intrusion prevention strategy.

1. "Guidelines to Address Water Intrusion Problems." University of Florida, Environmental Health & Safety: Safety in the Workplace. Accessed 7 December 2017. www.ehs.ufl.edu/programs/ih/ieq/water_interlude

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