

Planning for the Winter

Waterproofing Buildings

By Hiruy Dafla, PE

Short-term and long-term planning is required to manage your facility through the cold temperatures of winter, as well as the occasional snow and ice events. There are several potential water intrusion issues that need to be anticipated and preventative measures taken to avoid issues such as ice damming, domestic waterline and fire sprinkler pipe breaks, structural damage due to excessive snow loads, snow removal protocols, and long term freeze thaw cycles. Here's a few practical recommendations as you proactively make winter preparation your priority this fall.

Water Lines

One of the major issues to avoid is water intrusion caused by the cold weather. Significant property damage is caused by freezing water and fire sprinkler pipes that burst. For water lines that are not required during the cold winter months, the solution is easy: shut off the line from the internal valve and drain the pipes/lines in the region that is exposed to the cold temperatures. Piping systems that fall into this category include outside hose bibs, pool supply pipes, irrigation systems, etc. Homeowners should also be reminded to keep their heating system operational during travel, as turning them off could result in frozen pipes that result in burst water lines.

Sprinkler Piping

Fire sprinkler lines that are located in exterior walls and attic spaces can be exposed to the cold temperatures and, therefore, prone to freezing. These systems should be designed and installed to account for the cold weather. In parking garages, breezeways, HVAC closets, loading docks, and

other similar locations, a sprinkler system typically utilizes a dry line or a section of pipe filled with an antifreeze solution. Both dry systems and antifreeze filled sections require inspection. With dry systems, the system needs to be drained to remove any condensate accumulating inside the pipe. Fall is the best time of the year to perform such an inspection. Previous versions of the building code used to allow the use of antifreeze in the sprinkler lines as a whole, however this has been changed in recent years. If a building still utilizes such a system, yearly inspections are required to confirm the mixture concentration is appropriate. Low concentration mixtures do not provide adequate protection while high concentrations mixtures can actually be a fire hazard. Such outdated systems should also be planned for replacement or upgrade. If some of your piping is protected by electrical trace tape or other means such as mechanical heating, such systems should be inspected to ensure they are operational and ready for winter.

Roof Areas

Ice damming is another source of water intrusion in the winter months. This is caused when a higher portion of a steep slope roof (such as asphalt shingle roof) is warm enough to melt accumulated snow while the lower section of roof (eave section) is cold enough to re-freeze the flowing water. The frozen section forms the dam allowing water to accumulate and thus impedes the drainage creating a leak into the adjacent interior space. The flow of water is caused by air leakage and/or poor insulation in the attic space resulting in heat loss. Long-term planning to protect a building from such an

issue includes installation of ice and water shield (waterproofing membrane) along the edges of a steep slope roof, as well as proper air sealing and insulation of the attic. If a structure has a history of such leaks, consideration should be given to address the issue during future roof replacement work.

Late fall is the ideal time to perform gutter, downspout and drain cleaning, and flushing work. Foliage from the season typically clogs drainage systems and, if not cleaned, could exacerbate water intrusion issues described above. Also, make certain downspouts discharge water at least 10 feet away and down slope of the buildings foundation walls. Hose test the buried drainage lines to make sure they are clear as well.

Potential Snow Overloading

Snow removal and de-icing is a potential major issue that should be well thought out and planned ahead of time. Any agreement with a company performing snow removal should include a discussion regarding the type and size of equipment to be used, as well as restrictions on where snow can be stockpiled and how much can be placed in any one location. The size of the equipment and restrictions on stockpiling is a critical consideration as certain elevated structures such as plaza decks, garages, and terraces have a limited load capacity.

Snow Removal Damage Concerns

Building assets such as expansion joints, traffic bearing membranes, and stop blocks can be damaged by snow plow blades. Requirements such as using rubber blades/brushes and/or hand removal should be considered in certain regions of

the property. A site visit should also be arranged with the contractor ahead of the winter season to survey the site and mark out structures that cannot be covered with snow banks (fire hydrants, curb lines, drains, etc.) to prioritize as well as protect them from damage during snow removal effort.

The selection of appropriate de-icing agent is critical as some chemicals can cause damage to your property. Salt is typically used on sidewalks and asphalt pavement, however use of salt on structural decks such as plazas and garages should be avoided as the chlorides accelerate corrosion and concrete deterioration. A better option is using de-icing agents such as Urea or Calcium Magnesium Acetate (CMA) which have less of an impact on concrete structures. Plan to power wash all concrete by early spring to remove de-icing agents that may have been brought into the facility by vehicles. Inspect and flush drains each spring and fall, as well to prevent drainage issues.

Freeze Thaw Cycles

Freeze thaw cycles that occur during the winter season are also quite damaging to infrastructure. As water gets inside cracks in sidewalks, asphalt pavement, masonry, and concrete construction, the water freezes and the expansive forces induced by the formation of ice further increases the size of the cracks. Through the winter, this repeated cycle can be damaging to the structure. Efforts to seal cracks prior to winter can go a long way in helping extend the serviceable life of your building components. Depending of the structure, this may involve routing and sealing cracks with a sealant, or repointing deteriorated mortar joints, and removing and replacing masonry. 📷



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