

## Do you need a vapor retarder?

Following certain guidelines can make the vapor retarder layer decision easier

by Mark S. Graham

Many low-slope roof assemblies are designed without proper consideration of whether an impermeable vapor retarder layer is necessary to prevent moisture accumulation. In some instances, this results in unintended moisture accumulation within and possible premature deterioration of the roof system.

Following are guidelines designers should evaluate when considering whether to include a vapor retarder layer in their roof system designs to prevent unwanted moisture accumulation.

### Self-drying roofs

Whether intentionally designed as self-drying, many low-slope roof assemblies are, in effect, self-drying; they are designed and installed without an impermeable vapor retarder layer within a roof assembly's cross-section. As a result, there is little to no protection from moisture accumulation from a building's interior. There also is little to no deterrent for a roof assembly to dry down when conditions are suitable.

A roof assembly without a properly placed vapor retarder layer generally will accumulate some moisture when environmental conditions on the building's exterior are colder than the building's interior. In this scenario, the direction of vapor pressure and moisture vapor flow

EXPOSURE: 17" FOR  
ED PLY SHEETS,  
ETRIC-SIZED PLY  
SHEETS.

is from the building's interior toward its exterior into the building's exterior thermal envelope, including the roof system. In North America, these conditions are most common during winter.

When the conditions are reversed (when the interior temperature is cooler than the exterior temperature), the direction of vapor pressure and moisture vapor flow is from the exterior toward the building's interior. These conditions are most common during summer, particularly if a building is air-conditioned.

For a self-drying roof assembly to properly function, it

needs to dry down the moisture accumulated during periods of accumulation. If conditions are such that a roof assembly accumulates more moisture over time than it dries down, NRCA does not recommend the self-drying roof concept and prefers a properly placed vapor retarder layer within the roof system's cross-section.

### NRCA guidelines

NRCA offers the following additional considerations:

- NRCA suggests a vapor retarder layer be considered for low-slope roof assemblies installed in Climate Zones 6A, 7 and 8.
- NRCA suggests a vapor retarder layer be considered for low-slope roof assemblies if the interior relative humidity is expected to be relatively high, such as

NRCA suggests a vapor retarder layer be considered for low-slope roof assemblies if the outside temperature is below 40 F and the interior relative humidity is 45% ; ;

with swimming pools, museums and specific manufacturing facilities.

- NRCA suggests a vapor retarder layer be considered for low-slope roof assemblies if the outside average temperature during the coldest month is below 40 F and the expected interior relative humidity during winter is 45% or more. A map showing the general region of the continental U.S. where the outside average temperature in January is below 40 F is provided in the Condensation and Air Leakage Control Section of *The NRCA Roofing Manual: Architectural Metal Flashing and Condensation and Air Leakage Control—2018*.

### CRREL guidelines

The U.S. Army Corps of Engineers' Cold Regions Research and Engineering Lab has vapor retarder criteria based, in part, on NRCA's below 40 F and greater than 45% relative humidity criteria.

The CRREL criteria provide a U.S. map of interior relative humidities above which low-slope roof assemblies should include a properly placed vapor retarder layer within a roof system's cross-section. This map shows a threshold range of an 80% indoor relative humidity in the far South to a 30% to 40% indoor relative humidity in the North.

CRREL's map is based on a 68 F indoor temperature. For interior temperatures other than 68 F, CRREL supplies a correction factor graph.

### The design decision

Whether a vapor retarder layer is needed as a component of a low-slope roof system is best-suited for a building's mechanical system designer to determine. When sizing and designing a building's HVAC equipment, the mechanical system designer needs to consider outside conditions specific to the building's geographic location, climate conditions and desired interior design conditions. These same considerations form the basis for determining whether a vapor retarder layer is necessary for the building's exterior envelope, which includes the roof system.

In the absence of the building's mechanical system designer deciding whether a vapor retarder layer is necessary, this decision should reside with the building or roof system designer. The NRCA and CRREL guideline criteria are intended to provide designers with some roofing-specific guidance.

If a vapor retarder layer is deemed necessary for a building's exterior wall assembly, the designer also should consider a vapor retarder layer as a roof system component.

The design decision on whether to include a vapor retarder layer as a roof assembly component typically does not reside with the installing roofing contractor.

Additional information about NRCA's and CRREL's guidelines for vapor retarder layer usage is provided in Chapter 2 of the Condensation and Air Leakage Control Section of *The NRCA Roofing Manual: Architectural Metal Flashing and Condensation and Air Leakage Control—2018*, which can be downloaded or purchased from [shop.nrca.net](http://shop.nrca.net). 📄📖📄

Information about proper vapor retarder layer placement within a roof assembly's cross-section is provided in "Positioning is everything," May 2021 issue.

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## AEC firms are more likely to face ransomware attacks

Research by cloud-security provider Egnyte, Mountain View, Calif., shows architecture, engineering and construction firms are more than twice as likely to suffer ransomware attacks than all other industries studied, according to forconstructionpros.com.

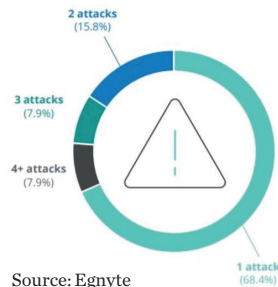
Thirty-one percent of AEC companies that were victims of ransomware were attacked at least twice during a 16-month period, and nearly 16% were attacked even more frequently.

Egnyte's "State of Ransomware Research Report for Architecture, Engineering and Construction" gathered insights from more than 2,700 AEC firms. The report showed companies with more than 1,000 employees were at the highest risk of attack, with most ransomware attacks targeting North American companies.

Egnyte's analysis revealed various factors specific to AEC firms that make them prime targets, including:

- The construction industry runs on a strict schedule, so delays resulting from lack of access to project files significantly can affect costs and project timelines and damage company reputations.
- Many AEC employees work remotely, and companies maintain a shared information environment with outside contractors on job sites, creating additional entry points for attackers.
- Tight profit margins along with the other factors mentioned make AEC firms more likely to pay a ransom so they can get back to work more quickly.

Frequency of Attack on AEC Firms



Source: Egnyte

"The threat of ransomware continues to rise as economic and technological factors make AEC firms prime targets for threat actors," says Ronen Vengosh, vice president of AEC for Egnyte. "Firms need to invest in a holistic defense program, which is a combination of the right prevention technologies, content governance and user-education so they can mitigate potential attacks and avoid any business disruptions."

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## Motion alert technology can help prevent equipment theft

In 2016, the National Equipment Register reported theft was more abundant than vandalism, fire, water and hail damage combined and estimated the value of construction equipment stolen each year is

between \$300 million and \$1 billion. That estimate is for equipment only and does not include tools and building materials, which often are easy targets for thieves. Theft also can lead to lost productivity, schedule delays and increased insurance premiums.

Security cameras on job sites reportedly can deter theft and help recover stolen property. TrueLook's 2020 Jobsite Security Report surveyed 739 construction professionals and revealed only 24% of stolen goods were recovered in 2019. Job sites with cameras were more likely to recover stolen equipment through police involvement.

Motion alert technology installed on a job site can send an alert via text and email with a picture when motion is detected and indicate which camera was triggered so an individual can pinpoint where an incident is occurring. It also can track and record high-definition video.

According to EMC Insurance, Des Moines, Iowa, job sites are most likely to be targeted when they are not actively staffed—most losses from theft and vandalism happen during weekends and on holidays. Equipment also is more likely to be stolen during warm weather months (from April to September), peaking in May, June and July.

Theft or vandalism should immediately be reported to local law enforcement. Stolen equipment should be reported to the owner's insurance provider and the National Equipment Registry as soon as possible at [ner.net/solutions/report-a-theft](http://ner.net/solutions/report-a-theft).

## Nearly 25% of employees have access to accounts from past jobs

A new report by Beyond Identity, New York, reveals nearly one in four employees said they still have access to emails and accounts from past jobs, according to forconstructionpros.com. The company surveyed more than 1,000 current employees about their password habits and tendencies.

Additionally, 41.7% of employees said they have shared workplace passwords; 42.5% of employees believed sharing work passwords should be a fireable offense; and more than 20% of employees said they have used the same password for their personal bank accounts as they did for work-related accounts.

The report comes as cyberattacks on businesses, government organizations and other groups are up by the thousands.

Regarding the safety of passwords, about 45% of respondents believed their passwords were very secure and 26.3% believed their passwords were extremely secure.

However, many employees remember their secure passwords through methods that are not so secure. Thirty-four percent of people said they wrote their passwords in a notebook or on a scrap of paper. Recording passwords digitally also was a popular option.

Two-thirds of employees shared their passwords with co-workers, and many also gave their family members or significant others access to their work information. People typically shared their passwords via email, orally or by text.



To access Egnyte's "State of Ransomware Research Report for Architecture, Engineering and Construction" and view steps you can take to prevent ransomware attacks, go to [professionalroofing.net](http://professionalroofing.net).