



ROOFING

COMMERCIAL ROOFING GUIDE

PROTECTING YOUR INVESTMENT



AN EBOOK FROM PB ROOFING

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A building's roof is one of its most important structural components. The roof is an investment that protects everything and everyone within.

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There are a few common hazards that can occur on a flat roof, that if not properly addressed, can develop into a serious and expensive concern.

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Commercial properties face the brunt of winter. It can lead to various issues that can shorten the lifespan of your roofing materials.





A typical commercial flat roof should last on average 20-25 years before needing to be replaced. On the shorter end it could need replacing in 10 years, and on the longer end, it could last even 50 or more years.

FLAT ROOF MEMBRANES

Infographic

EPDM

LIFESPAN: 20 - 25 YEARS

EPDM is a synthetic rubber material commonly used because it's low-cost, and easy to apply.

1. EPDM Non-Reinforced Roofing Membrane
2. EPDM Tape Primer & Seam Tape
3. EPDM Bonding Cement
4. Roof Board (Mechanically Attached)
5. Roof Insulation (Mechanically Attached)
6. Fasteners
7. 18 - 22 Gauge Steel Deck

PVC

LIFESPAN: 20 - 25 YEARS

PVC (vinyl) membrane roofing provides energy efficiency because of its UV resistance and white color.

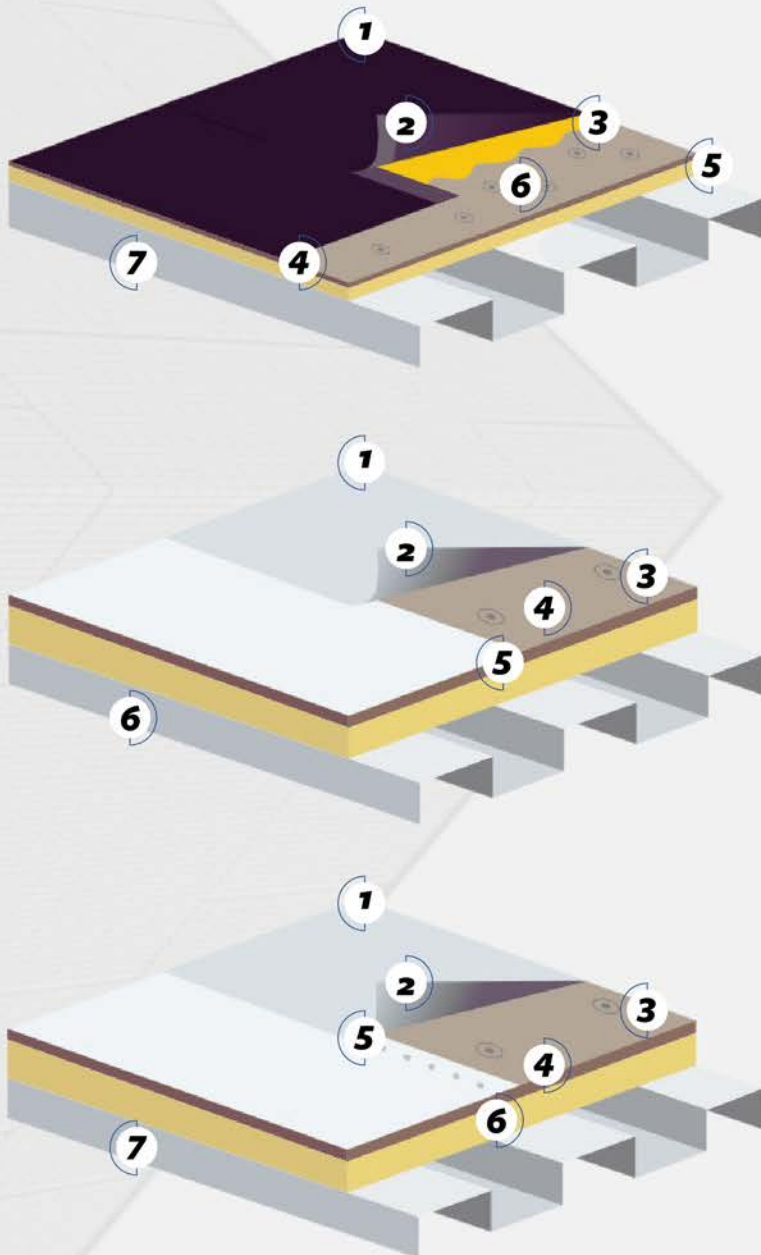
1. PVC Adhered Membrane
2. PVC Membrane Adhesive
3. Fasteners
4. Roof Board (Mechanically Attached)
5. Roof Insulation (Mechanically Attached)
6. 18 - 22 Gauge Steel Deck

TPO

LIFESPAN: 20 - 25 YEARS

TPO flat roof membrane is Thermoplastic Polyolefin, which is a single-ply roofing.

1. TPO Membrane (Mechanically Attached)
2. Lap Heat Weld
3. Fasteners
4. Roof Board (Mechanically Attached)
5. Fasteners
6. Roof Insulation (Mechanically Attached)
7. 18 - 22 Steel Gauge Deck





Making the Most of Your Commercial Roof Warranty

A commercial roof warranty is a legally bound association with three different groups that are involved in the roofing process. These groups are the commercial roofing contractor, the property owner, as well as the roofing materials manufacturers.

It is crucial to the longevity of your roofing system that you understand the details of your warranty prior to needing it for repair.

In most cases, the power of the warranty covers the workmanship and is backed by the manufacturer. A primary benefit of a manufacturer-backed warranty is that a manufacturer-trained inspector will thoroughly inspect your roof to ensure that no shortcuts have been taken. Most issues with a roof are attributed to workmanship and improper flashing details at pipes, penetrations, curbs, walls or edge metals, these issues would be covered with a labor warranty.

Now that you know what is covered, there are a few things that are not. Disrepair caused by neglect (annual inspection is required to keep your warranties effective), failure to address damage caused by severe or rare weather conditions, failure to perform regular maintenance on common leaks or repairs, and any unauthorized modifications or upgrades

When selecting a commercial roof warranty, look closely at the length, what's covered, and any limitations on the dollar amount of the coverage. Annual or periodic maintenance by your commercial contractor is required by most manufacturers to maintain the roof warranty. A 20-year manufacturer No Dollar Limit (NDL) warranty covering both materials and labor is the most common warranty.

Most building owners tend to opt-in to a roofing warranty for peace of mind, knowing that their asset is protected and covered. On the east coast, many building owners will choose to use weather-resistant materials. While a warranty won't cover weather-caused damage, it may cover the replacement or repair of a material that had claimed to be weather resistant. Warranties can also help save money down the line if, years later, a material-related repair or replacement needs to be performed.



The Dangers Above: Common Commercial Roof Damage

The commercial roof is a vital component of a building's working utility system. Installations such as: HVAC units, skylights, solar panels, electrical wiring, and communication systems each require their own installation, replacement, and maintenance.

Every time someone sets foot on a commercial roof, inevitable damage occurs. Tools and machinery can be dropped, potentially puncturing the roof membrane. Nails, screws, and other hardware are often left behind during an installation or maintenance project. These build up over time and spread across the roof's surface, each acting as a potential puncture hazard waiting to happen.

Because of their low-slope, flat roofs sometimes do not offer the appropriate drainage for rainfall run-off. Most flat roofs are built with a minor slope to allow for drainage, but the lack of a significant natural slope can produce challenges.

Leaves, branches, and other debris carried by the wind and blown about the roof surface, easily clogging the drainage systems. This creates areas of standing water, where weight can suddenly weaken the roof's surface.

Standing, or ponding water, collects in low sections of the flat roof's surface. Dirt, debris, and other matter quickly settle within these puddles and over time and eat away at the roofing membrane. As time passes, standing water can cause more severe damage. Two common types of damage caused by standing water are soft spots and leaking.

Rainfall collects in standing ponds on the roof. The weight of this water will eventually cause the roof to sag. Soft spots occur when the roofing structure below the surface becomes compromised by water and weakens.



Leaks are what occur to the interior of a building when the roof is in a state of disrepair. Leaks cause damage to your property investment and equipment.

Exposure is arguably the basis of all flat roof problems. Since a building's roof is constantly exposed to the sun and other elements, damage is unavoidable. No roof, regardless of durability, is built to last forever.

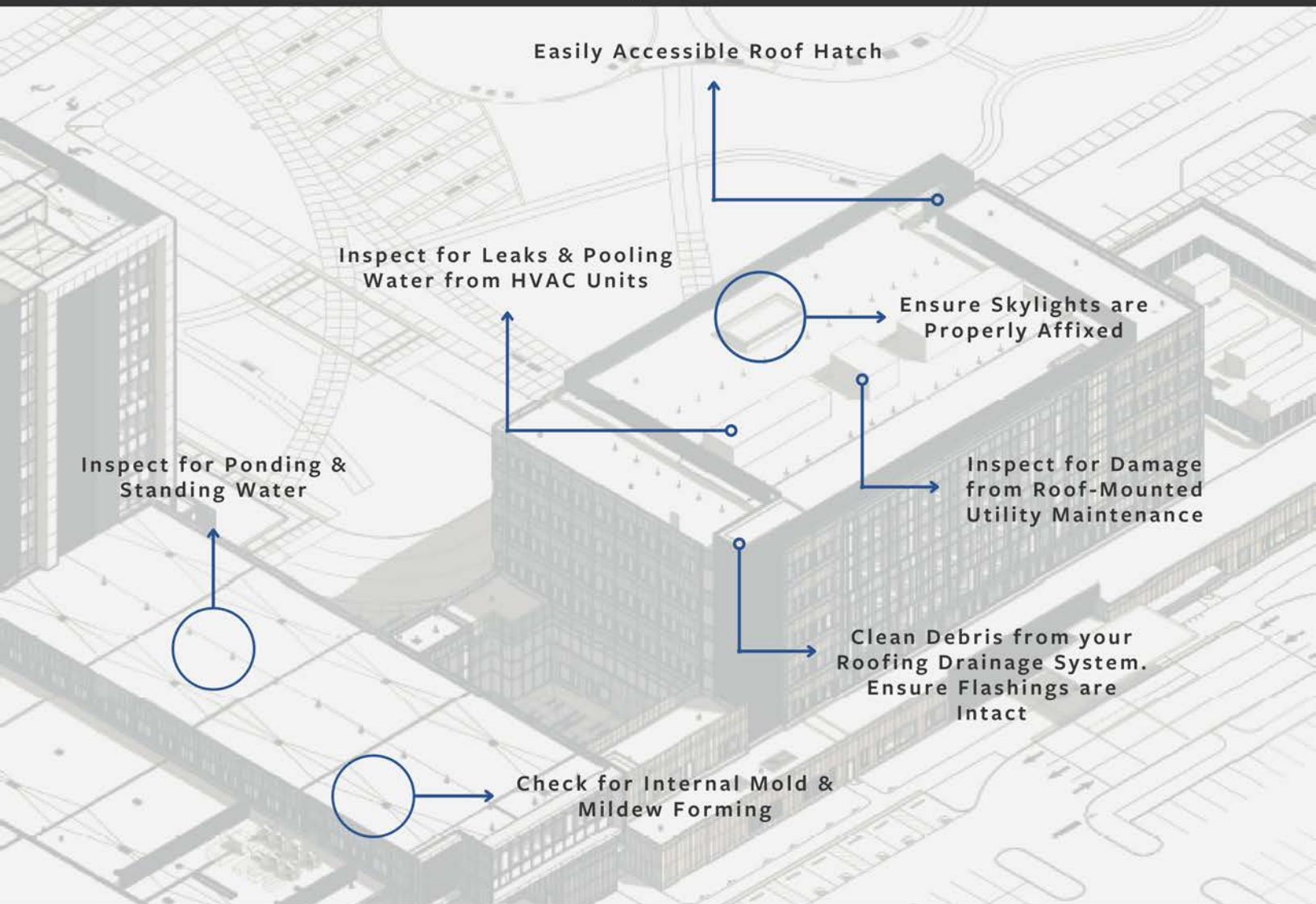
Other than over-exposure to the sun, other common weather events are lightning strikes, freezing temperatures, hail, and wind damage. There are even lesser-known exposure issues such as oil damage and exposure from outside contaminants and chemicals.

Expansion and contraction of roofing materials defines the phenomena known as Thermal Shock. It occurs when temperatures quickly fluctuate and stress the roof system's material components, damaging older materials with a reduced elasticity.

Various sections of the roofing system expand and contract differently, pushing and pulling against each other. Horizontal-to-vertical transition areas such as: curb flashings, parapet walls, exhaust systems, pitch pans, and pipe entrances are most susceptible to Thermal Shock. Areas that require sealants and drainage components should be monitored closely as well as transition areas.

PREVENTATIVE MAINTENANCE

Infographic



The longevity of a flat roof is dependent upon: climate, quality of installation, system type, roof penetration and proper maintenance.

Checking the seams, flashings, and all around the rooftop penetrations, periodically and after rainstorms should be done.

Detecting any damage or worn areas before there's water leakage will increase the longevity of the membrane and save any costly damage to the foundation of the building underneath.

Fighting the Freeze: Winter Weather Effects

Heavy snowfall and freeze-thaw cycles can quickly create dangerous conditions for your commercial roof. A potential roof collapse can result in hazardous damage to your building and those inside.



A flat roof can potentially collect several feet of snow throughout the winter months. Snow can cause damage to the internal structure and cause safety risks at ground level, which is the liability of the property owner. Consequently, roof snow should always be removed. However, it should be done strategically, and not haphazardly. Damage can easily occur to the roofing membrane and roof-mounted utilities if the project is not completed by a professional.

We recommend making sure the roof is properly insulated and attics are properly vented. Insufficient insulation and venting can contribute to the melting of snow closest to the roof surface and can cause an ice dam, or an accumulation of frozen water at the edge of the roof that prevents water from running off.

One cubic foot of snow may weigh from seven pounds to 30 pounds. This is not considering that if it subsequently rains or sleet on a snowy roof, the weight will significantly increase.

Due to these weight variations, it is vital that your roof be monitored by professionals during and after winter storms.

Windy conditions can result in added snow and cause it to unevenly disperse from one flat roof plane to another.

FEMA provides a list of signs that indicate a building may be too stressed by the snow load.

- Ceiling problems: A ceiling that appears to sag, or sprinkler lines and sprinkler heads that look lower than normal.
- Unusual noises: Creaking, popping, and cracking can be a sign of a stressed roof.
- Door and window problems: If a door or window can no longer be opened or closed it may be a sign the roof or walls have shifted under the weight of snow.
- Wall problems: Drywall, masonry and other wall materials may crack under pressure from an overloaded roof.
- Restricted Access Points: Excessive snow accumulation can block access to the roof hatch. Reliance on secondary access points such as ladder usage in adverse weather conditions is not recommended and reduces the safety of the overall project.



Unremoved snow ultimately melts and moves into the roof drainage system. External drainage systems cannot retain enough heat in the winter to prevent water re-freezing inside. The expansion of this ice within the pipes severely damages the drainage system. Gutters become congested with snow and ice, exceeding their maximum weight capacity, causing them to bend or dislodge. This allows melted snow to flow directly down the sides of the external structure, leading to possible concerns with the masonry, siding, and/or the foundation.

The freeze and thaw cycle can deteriorate the quality of roof membranes. As thermal expansion occurs, drastic shifts in temperature from day to night affect the exposed roof. When the roof absorbs heat from the sun, the materials can expand, pushing against its own seams, causing gaps.

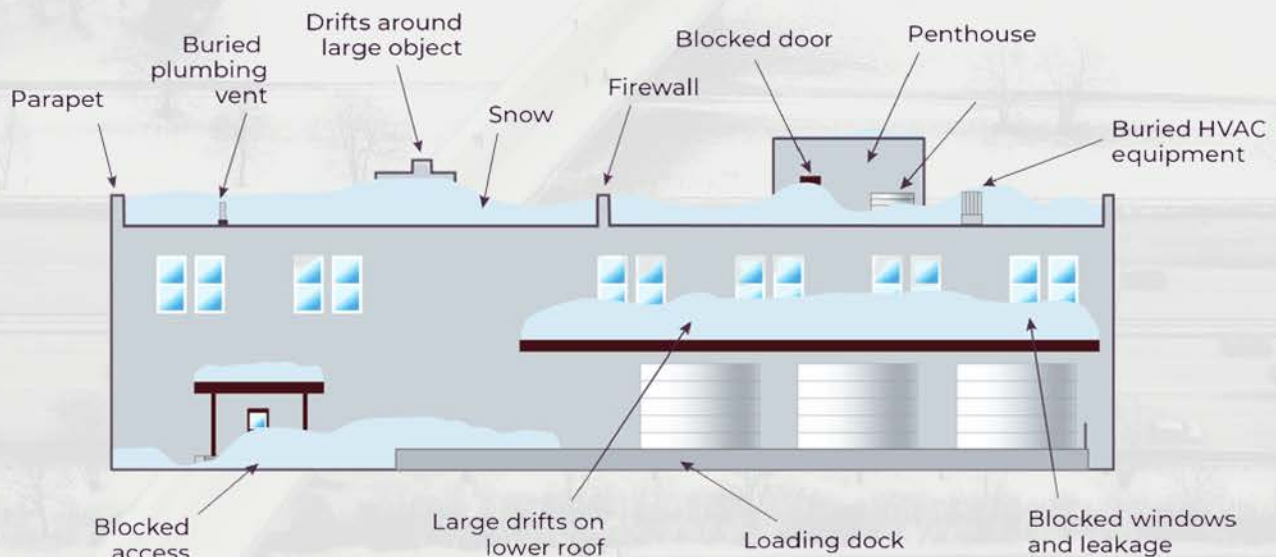
This process then reverses during lower night temperatures. Water is then free to work its way into minor crevices and weaknesses in the roof membrane, worsening the condition as it re-freezes and expands. As this cycle occurs daily, the damage can become serious.

A building's HVAC system may fail to operate if it becomes covered in ice and snow, which can pile up on the aluminum fan and bend the blades. If this occurs, the HVAC unit might produce strange noises while operating, and the fan blades can potentially shatter.

Water can puddle around external equipment such as skylights, vents, and flashing whose caulking or insulations are susceptible to the same type of freeze / re-freeze damage as the roofing membrane.

Gas lines and electrical conduits can also become brittle in extremely low temperatures, leading to damage or improper functionality. Frozen pipes result in obstructions, which will gradually back up in the direction of the source.

While ice falling long distances can be fatal, ice doesn't have to fall from tall structures to cause damage. Icicles detaching from buildings can often be enough to cause lacerations, head injuries, broken bones, and even death in rare cases. In addition, dripping water from melting icicles may pool on the ground below and refreeze, creating a serious slip-and-fall hazard.





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