

# Safety Zone: Benefits of Properly Maintaining Roof-Mounted Equipment

Roof damage is a major source of property loss each year when buildings are subjected to high winds, wind-driven rain, hail, ice, snow and wildfire. A compromised roof can lead to significant damage to internal fixtures, furniture and equipment.

What's more, rooftop equipment or pieces of the roof itself can take flight during a windstorm, causing damage to the building, nearby vehicles or even neighboring property. Proper attention to all aspects of a roof can make the difference between minimal damage and catastrophic failure during high winds.

To help business owners tackle roof issues, the [Insurance Institute for Business & Home Safety \(IBHS\)](#) has produced a series of short papers on the installation, maintenance and repair of commercial roofs.

The focus here is on roof-mounted equipment, such as HVAC, solar panels, exhaust fans, and other mechanical units, all of which are common features on many commercial rooftops. Proper maintenance of this equipment leads to long-term savings by prolonging the life of the equipment, lowering utility bills and affording greater protection in a storm.



## Energy Efficiency

Proper ventilation of roof-mounted air conditioners and air makeup units means greater energy efficiency, which leads to lower electric bills, a smaller carbon footprint and a more comfortable indoor climate for the building's occupants. Clogged and soiled air filters can reduce airflow and affect the unit's heating and cooling abilities. Poor ventilation also requires the unit to run for longer intervals, causing greater wear and tear on the motors and a shorter operating lifetime.

Steps business owners can take:

- Replace the air filter per the manufacturer's guidelines. This is an easy and cost-effective way to help maintain a ventilation system's efficiency.

## Keep Parts in Good Working Order

Motors, bearings and belts should be well maintained following the manufacturer's maintenance guidelines to ensure proper operation of rooftop units. This will help prolong the life of the unit and prevent breakdowns, which can have cascading effects on many aspects of business operations.

Steps business owners can take:

- Keep motor and fan bearings well lubricated.
- Ensure that rubber belts have the proper tension. Belts that slip will emit a high-pitched whining sound similar to an automobile's belt slipping.
- Watch for signs that rubber belts have become brittle and cracked. Remember, belts have a limited lifespan and should be inspected and replaced when directed by the manufacturer or upon signs of deterioration.

## The Importance of Balance

Fan blades operate most effectively when they are well balanced. When the blades are unbalanced, the unit will vibrate and this may cause screws and other parts to loosen. An unbalanced fan reduces efficiency and compromises the unit's secure attachment.

Steps business owners can take:

- The greater the imbalance, the greater the vibration. This vibration may become obvious on smaller-sized units but should be part of regular inspections.
- When a rooftop unit begins to vibrate and shake, contact a reliable contractor to correct problems that may cause the fans to be unbalanced.

## Exterior Maintenance and Secure Attachment

Because rooftop equipment is exposed to all weather elements, it is vital to maintain the unit's exterior and make sure it is securely attached. Corrosion and deterioration are the most common problems and can allow panels or other parts to become airborne in the event of high winds. Additionally, most commercial roofs have one or more roof curbs associated with the roof-mounted equipment. A roof curb is an elevated platform that supports rooftop equipment and roof penetration points such as HVAC ducts, exhaust fans, etc. In addition to holding equipment, it must also maintain the weather-proof envelope of the building and keep water out.

Steps business owners can take:

- Inspect for rusted metal panels, screws and metal flashing on curbs, and replace as soon as possible.
- Inspect around the unit's connection to the curb it sits on. Check for any visible signs of potential leaks; these can be repaired using various roof sealants and caulks that are readily available.
- If it is suspected that a water leak has occurred, the curbing itself should be inspected for corrosion, rotting or other failure and replaced if needed.

## Check and Recheck

While a local contractor or maintenance worker can perform most of the inspections and repairs that are necessary to keep rooftop equipment in good working order, it is important to inspect the equipment after the work is done to make sure all screws, cables and cable straps are tightened and back in place.

Failure to correctly reinstall screws and cables can compromise the unit's overall structural integrity and leave it vulnerable to potential damage during a windstorm. For example, the panels can tear away and skip across the roof cover. This creates water leaks and, in some cases, causes the roof cover to fail.

Steps business owners can take:

- Remind the contractor that you will not consider the job done until all parts of the unit are back in place and properly secured and all debris is removed.
- After rooftop equipment repair, have maintenance staff inspect the unit to ensure that screws, cables and cable straps are tightened and reconnected.
- Check the roof for miscellaneous debris, as well as tools that may have been left behind. Anything that is not firmly attached to the roof can become windborne debris in the event of a storm.

For additional information about maintaining commercial properties, please visit:

<https://disastersafety.org/maintenance/how-to-inspect-and-maintain-your-commercial-roof/>

## About the IBHS

IBHS is a non-profit applied research and communications organization dedicated to reducing property losses due to natural and man-made disasters by building stronger, more resilient communities.

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