

Commercial Series

PROTECTING ROOF-MOUNTED HVAC UNITS FROM SEVERE WEATHER

Roof-mounted HVAC units are exposed to severe weather year-round, resulting in a significant amount of property loss across the country. Extreme conditions such as high winds, hail and winter weather can directly impact the integrity of equipment, and cause damage to the roof and surrounding areas. Fortunately, through preventive design and routine maintenance, you can protect your equipment, reduce damage and minimize downtime for your business.

HIGH WINDS

During a high-wind event, unsecured equipment is subject to sliding, lifting and overturning. To prevent this, equipment should be securely attached to a curb (see photo) which is attached to the roofing structure. An equipment-to-curb connection can provide adequate uplift resistance in some instances.

If the equipment connection to the curb alone is not adequate, high-strength, corrosion-resistant cables or straps should be tightly installed over the top of equipment and extend down to the curb or roofing structure. Hire a licensed contractor to help with installation. Lastly, ensure all service panels have all fasteners in place so panels do not become dislodged.

For more information on attachment of roof-mounted mechanical equipment, please refer to FEMA's "[USVI-RA2 Attachment of Rooftop Equipment in High-Wind Regions](#)."



Don't leave roof-mounted HVAC systems exposed to severe weather without proper protection.



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Is your business located in a high wind-prone area? Reinforce roof-mounted equipment with stainless steel cables and turnbuckles (shown above) to reduce risks.

DID YOU KNOW?

Reinforced curbs, brackets, turnbuckles, cables and straps can also help combat wind forces; this is especially important in high-wind zones.



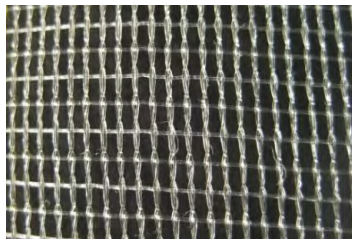
Note the reinforced cables helping secure the HVAC system on the commercial roof pictured above.

High Winds - Routine Maintenance

- ✓ Check equipment for rust on metal panels, screws, and metal flashing on curbs.
- ✓ Inspect equipment's connection to the curb it sits on. Look for visible signs of curb leaks; these can be repaired using readily available roof sealant and caulk. If a water leak is suspected, check curbing for rot, and replace if needed.
- ✓ Pull on all cables and straps to verify they are tightly secured; there should be little to no slack. Check manufacturer guidelines for more specific information.
- ✓ After all inspections and repairs are complete, re-inspect equipment to make sure all screws, cables and straps are tightened and back in place.

HAIL

Hailstorms can cause significant damage to roof-mounted HVAC units. However, equipment can be protected with hail guards, which are specially designed protection systems that cover outdoor equipment components while allowing for adequate airflow.



Hail nets (shown above) can reduce HVAC system damage.

Although there are no standardized tests to compare the performance of specific systems, coil-based hail guard systems and hail guard netting seem to offer better protection in many hailstorm scenarios. These can be purchased as part of new equipment or can be installed on existing equipment. For more information, see ["Hail Guards: Protection for Roof-Mounted HVAC Equipment."](#)

Hail - Routine Maintenance

- ✓ Ensure hail guards are properly installed and securely fastened to prevent movement during high-wind or hail events. Contact the manufacturer immediately to address any loose or missing guards.
- ✓ Monitor guards for any reduction in airflow to minimize compressor failure.
- ✓ Keep guards clean and free of debris.

WINTER WEATHER

Snow drifts can cause snow and ice to accumulate on and around roof-mounted equipment; this can result in increased loads on your roof, make leaks more likely, and affect equipment operation. Additionally, melting snow and ice can produce excess water runoff, which could cause leaks without proper drainage. One effective mitigation strategy is sloping the roofing insulation during the construction or re-roofing of a building. This guides water off the roof or to a roof drain.

SNOW DRIFTS

For more information on snow drifts, see ["Snow Load Risks for Commercial Roofs."](#)



Keeping roof drains clear of debris (shown above) allows for proper drainage during severe winter weather, preventing water damage.

Winter - Routine Maintenance

- ✓ Clear debris from roof drains to allow proper water drainage.
- ✓ Check for and repair cracks and sealing around roof drains.
- ✓ Before a snow storm, clear any debris that could cause excessive ponding around and under equipment—this water can refreeze later and become very heavy.
- ✓ If temperatures do not rise above freezing after a heavy snow storm, have a licensed contractor remove excess snow from the roof and from around equipment.

CONCLUSION

With proper design, retrofits, preventive maintenance and appropriate care of roof-mounted HVAC units, it is possible to reduce losses associated with high winds, hail and winter weather. Following the essential steps outlined above can help cut down on the need for expensive repairs, mitigate business downtime, and ultimately prevent serious damage to your business and your bottom line.