

ROOF HATCH SAFETY:

Meeting OSHA Fall Protection Regulations

By Michael Toohey

Throughout the world, roof hatches provide access to roof areas for the maintenance of HVAC and other roof-mounted equipment, as well as facilitate the installation or removal of large pieces of equipment in commercial buildings. Although roof hatches offer great convenience to building owners and maintenance personnel, if left open, they can pose a potential fall hazard that can result in severe or deadly injuries. (See *Photo 1*.)

The Occupational Safety and Health Administration (OSHA) is a government agency that “aims to ensure employee safety and health in the United States by working with employers and employees to create better working environments.”¹ As such, OSHA has enacted fall protection regulations for roof openings and has made available multiple options to ensure a safe roof environment. This article will discuss basic hatch specifications, the OSHA fall protection requirements for roof openings pertaining to

roof hatches in finished buildings, compliance options, and noncompliance penalties.

ROOF HATCH BASICS

The hatches examined in this article are horizontal doors that cover roof openings and provide access to roof areas by means of an interior ladder, ship stair, or service

stair. The method of access depends on the size and type of the structure and the hatch’s intended purpose. For example, a manufacturing facility with a high ceiling typically requires a ladder to access the roof; whereas, an office building or school might have a traditional set of stairs or a ship stair leading to the roof. Roof hatches



Photo 1 – Installed in commercial buildings throughout the world, roof hatches are used for a variety of purposes and can accommodate the access requirements of any application. However, unprotected openings for roof hatches create a potential fall hazard for service personnel; therefore, OSHA enforces strict regulations to protect roof openings.



Photo 2 – Equipment-access roof hatches serve as a means of entry for large pieces of equipment and are generally double-cover models that are custom-manufactured to specific size requirements.

are installed on many nonresidential buildings, including factories, offices, shopping centers, and storage facilities. (See *Photo 2*.)

Roof hatches come in a variety of sizes that range from small, single-leaf (one-cover) models that accommodate a single person at a time to very large, double-leaf (two-cover) models designed to facilitate access for large pieces of equipment. Additionally, most manufacturers provide custom sizes to accommodate nearly any application. The project size and the type of building will determine the number of roof hatches that are required.

When selecting a roof hatch, it is important to establish a systems-appropriate material for its construction. Roof hatches are available in a variety of materials. Galvanized steel is the most common material, primarily due to price considerations. Aluminum hatches carry a slight price premium, but they offer a higher level of corrosion resistance and require little or no maintenance. Hatches can also be provided in stainless steel and copper construction. While these products carry a price premium, they are required in unique applications such as extremely corrosive environments (such as a chemical plant) as well as heritage projects that require the use of copper to

match the aesthetics in historical districts.

KEY DESIGN ELEMENTS

Ease of operation, energy efficiency, and weathertightness are key design elements to take into consideration when selecting a roof hatch. Since facility staff and other maintenance professionals often need to be able to open the hatch cover with tools or

equipment in hand, the hatch should have uniform lift assistance to provide smooth, safe operation and to prevent the cover from slamming. A mechanical method of lifting the hatch, such as compression springs, allows the cover to be safely opened and closed regardless of cover size and weight. The hatch should also include automatic hold-open arm(s) to lock the cover(s) in the open position to further ensure worker safety.

Fully welded corners and full insulation in the hatch cover and curb will help maintain energy performance levels in a building. Many manufacturers also offer insulation options for enhanced thermal performance. In addition to

proper insulation, a high-quality roof hatch should also feature an overlapping cover design and full perimeter gasketing for complete weathertightness.

OSHA FALL PROTECTION REGULATIONS

When left in an open position, any size roof hatch can create a potential fall hazard. Workers can sustain an injury by losing



Photo 3 – This ladder-access hatch has a hatch railing system, which satisfies OSHA 29 CFR 1910.23 standard by ensuring continuous fall protection around the hatch opening.

their footing, tripping, or stepping backward without looking. To improve safety concerning roof openings, OSHA created the 29 Code of Federal Regulations (CFR) 1910.23, Guarding Floor and Wall Openings and Holes. This standard states, "Every ladder-way, floor opening, or platform shall be guarded by a standard railing with standard toe board on all exposed sides (except at the entrance to an opening), with the passage through the railing either provided with a swinging gate or so offset that a person cannot walk directly into an opening."²

REGULATORY COMPLIANCE

Consultants and other industry professionals have several options to protect roof hatch openings in accordance with the above-stated OSHA fall protection standards. While on the roof, personnel can simply close the hatch cover behind them to reduce the potential of a fall hazard. It is important that the cover be securely closed and latched to ensure that it cannot be accidentally opened. Workers, however, often hesitate to perform this operation for fear of being locked out on the roof.

Another approved fall protection method is a railing system installed around the roof hatch to protect the opening when the cover is in the open position (*Photo 3*). Railing systems are permanently affixed to the hatch and, as a result, workers do not need to close the cover when they are on the roof.

To maintain a constant protective barrier around the hatch, a railing system should be equipped with a self-closing gate or a safety chain enclosure to meet OSHA standards. The main difference between these two options is that the latter requires personnel to latch the chain in order to maintain the safety barrier. OSHA does, however, require that the safety chain afford protection "at least as effective as" the swinging gate. An interpretation of standard 1910.23 states:

...The safety chains would be adequate and noted as a *de minimus* violation. [This type of violation is defined by OSHA as one] which has no direct or immediate relationship to the safety or health of employees, carries no penalties, and does not require abatement of the violation.³

Regardless of the method chosen to protect the entrance, the 1910.23 standard lists the following requirements for the rail-

ing system itself (for more details, visit the OSHA Web site):

- A smooth-surfaced top rail at a height above the floor, platform, runway, or ramp at a level of 42 in nominal;
- Strength to withstand at least the minimum requirement of 200 lbs of top-rail force;
- Protection between the top rail and floor, platform, runway, ramp, or stair treads, equivalent at least to that afforded by a standard intermediate rail.⁴

In addition to these OSHA requirements, a well-designed railing system should feature other industry-prompted specifications, such as the following:

- It should be designed to fit on the capflashing of any brand of a roof hatch, without penetrating the roofing material (a potential leak path).
- It should be simple to install and require only basic hand tools. No installation training or certification should be needed.
- The attachment system should allow the railing to be easily installed and



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Photo 4 – The ladder-access hatch is featured here with a retractable safety post that helps ensure additional worker safety. This post permanently mounts to the top two rungs of any fixed ladder, providing a positive handhold and enabling the user to enter or exit an opening in an upright and balanced position.

have provisions for adjustability to accommodate varying mounting conditions.

- It should be constructed of a durable, corrosion-resistant material and supplied with a warranty that protects the building owner against product defects and flaws in workmanship.

The industry has also made products available to complement the railing system for additional worker safety. One such product is a telescoping ladder safety post (*Photo 4*), an extension device that permanently mounts to the top of two rungs of any fixed ladder. It provides a steady handhold that enables a worker to enter or exit an opening in an upright and balanced position. For maximum flexibility, a ladder safety post should feature adjustable mounting hardware to accommodate any ladder-rung size or spacing.

NONCOMPLIANCE PENALTIES

If consultants fail to ensure a safe roof environment, building owners may face serious consequences, with a workplace accident as the most devastating potential


outcome. In addition to the safety and liability concerns, OSHA imposes penalties and fines for noncompliance:

- A willful violation is one that the employer intentionally and knowingly commits, and it carries penalties of between \$5,000 and \$70,000.
- Penalties up to \$7,000 may be proposed for serious violations when there is substantial probability that death or serious physical harm could result and that the employer either knew or should have known of the hazard.
- Repeat violations can incur penalties of up to \$70,000.
- For the failure to correct a prior violation, an employer may be charged

a civil penalty of up to \$7,000 for each day past the due date.

- Other violations are ones that are unlikely to cause death or serious harm but are still violations of agency policy. These can bring fines of up to \$7,000.⁵

CONCLUSION

Hatches provide convenient, reliable access to roof areas. These openings can, however, create a fall hazard and potential OSHA violation if not properly protected. It is important that consultants take into consideration the roof hatch safety measures discussed here. While there are many factors to consider in the hatch selection process, user safety should always remain a priority. 

REFERENCES

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