ROOF HATCH BASICS

Learn how to choose a roof hatch and comply with applicable safety regulations

by Michael Toohey
Most commercial buildings require access to their rooftops to maintain HVAC or other rooftop-mounted equipment. Although there are several ways to access roof areas, the most common way is to use roof hatches. Roof hatches provide direct access to rooftop areas and are designed with many features and options to ensure safe access for maintenance workers and weather-proof performance for building owners.

When working with roof hatches, it is important to know about basic roof hatch specifications, including hatch selection considerations, and the various options available. Also, being familiar with the Occupational Safety and Health Administration’s (OSHA’s) fall-protection regulations for roof openings that pertain to roof hatches, specifically 29 CFR 1910.23, “Guarding floor and wall openings and holes,” as well as several safety options and penalties for noncompliance, is necessary to keep workers safe on job sites.
Size matters

Roof hatches are available in a wide range of sizes. There are numerous factors to consider when selecting a hatch size for a particular application. First, determine whether the hatch will be used simply to gain access to a roof or whether it is needed to install or remove equipment from a building.

If a hatch is to be used for personnel access only, small or single-cover models should be specified. These models typically are used with a fixed ladder, ship stair or service (full-size) stair. Roof hatch size is defined by measuring its inside frame opening, and the roof opening should be roughly the same as the hatch size. Some industry-standard sizes follow:

- 36 by 30 inches for ladder access
- 30 by 54 inches for ship- or steep-stair access
- 30 by 96 inches for service stair access

A building’s type and size generally will determine the method of egress, which, in turn, determines roof hatch size.

For example, a large building, such as a manufacturing facility with high ceilings, may require the use of a fixed ladder to gain access to a roof area, but an office building or school could incorporate a staircase into a structure’s upper level. The frequency and reason individuals need to access a roof area also can affect hatch size. If maintenance personnel will be required to carry large tools or parts onto a roof for service, a larger hatch with stair access should be considered.

In addition to personnel access, larger roof hatch sizes are available to allow for installation or removal of equipment from a building. Whether a building is an office building, hospital or manufacturing facility, equipment type and dimensions will determine its roof hatch size.

Roof hatches designed for equipment access generally are two-cover models that are custom-manufactured to specific size requirements. When determining the size of a hatch for a particular piece of equipment, it is important to contact the roof hatch manufacturer to verify the hardware locations on the hatch and the clear opening of a particular size.

Material choice

Another important consideration when selecting a roof hatch is its material. Typically, this decision is based on cost, aesthetics, maintenance considerations and a hatch’s geographic location. Hatches are manufactured in galvanized steel, aluminum, stainless steel and copper.

Galvanized steel is the most common material choice. It provides a basic degree of corrosion resistance and typically is supplied with a primer paint finish. Aluminum hatches are supplied with a mill finish and are slightly more expensive than galvanized steel. However, they offer a higher level of corrosion resistance, particularly in coastal areas, and require little or no finish maintenance.

Stainless-steel and copper roof hatches also are available, but there is a significant
premium for these products. Stainless-steel hatches offer the highest level of corrosion resistance and are installed in environments such as chemical plants or coastal areas with extreme weather conditions. Copper roof hatches are fabricated to match the aesthetics of historical projects or for buildings located in historical districts.

**Safe, easy operation**

Operation is one of the key factors to consider when selecting a roof hatch. Workers usually need to raise a hatch upward from inside while standing on a ladder or stairs, often with tools in hand, so every hatch should be equipped with lifting mechanisms. These devices should provide uniform lift assistance to ensure smooth, easy operation and minimize the effort required to open and close the hatch.

In addition, proper lift assistance, along with an automatic hold-open arm, ensures the cover will not slam shut on a user while he or she is entering or exiting a hatch.

**Thinking green**

Energy efficiency is an important consideration for all buildings, and a properly constructed roof hatch will help maintain the energy performance levels of an efficiently constructed building.

To help maximize energy efficiency, it is important to select hatches that feature fully welded corners and insulation in the cover and curb. Many hatch manufacturers also offer insulation options for enhanced thermal performance. Roof hatches also should feature an overlapping cover design and full perimeter gasketing to ensure complete weatherproofness.

**Custom options**

Roof hatch manufacturers offer options to customize a product to suit a particular application without compromising features or performance. Some custom options include the following:

- Curb options can simplify installation on various roof systems. Roof hatches can be supplied with curb liners or fully enclosed curbs for installation on existing curbs. Curbs also can be modified so they can be installed directly on standing-seam metal roof panels. This modification allows a hatch to sit directly on a metal roof, eliminating the need for a job-built curb. (*Editor’s note: In these situations, NRCA recommends using flashing installation techniques that do not back water.*)
- Most roof hatches are supplied with interior and exterior padlock hasps as a standard feature to prevent unauthorized access. Custom security options can include keyed cylinder locks and contact switches for alarm systems. For high-security buildings such as prisons, banks or pharmacies, hatches can be fabricated from heavier gauge materials and modified with numerous options to provide enhanced security.
- Hatches can be specified with a polycarbonate dome cover to provide the added benefits of a skylight. The cover allows natural light into a building, possibly reducing energy costs and providing a more pleasant building environment.
- Hatches can have louvers incorporated into the curb to provide continuous ventilation into a building.
- Hatches can be designed to open and close remotely via an electric motor or a winch. Both options provide ventilation and simplify operation.
- Special finishes are available from hatch manufacturers for added corrosion resistance or to allow a hatch to match a building’s exterior. Common finish options include anodized aluminum and paint finishes such as Kynar®, Tnemec® and powder coats.

**Out with the old**

Roof hatches primarily are designed to be installed during new roof system installation. But in many cases, a hatch is damaged or requires replacement before a new
roof system is needed. In these cases, a low-profile replacement hatch can be used.

Low-profile replacement hatches are designed to be installed on an existing hatch curb, eliminating the need to replace roofing materials. The old hatch cover is removed, and the new, low-profile curb simply mounts directly onto the existing curb. A flanged design and full apron ensure a weatherproof connection.

Safety first

Although they serve various purposes, roof hatches left open can create potential fall hazards. According to the U.S. Department of Labor, in 2006 alone, 200 falls through existing roof openings were reported—13 of which were fatal.

To help prevent people from falling into holes and openings on roofs, OSHA has created rules to protect workers and products are available to ensure compliance.

Since the early 1970s, OSHA has promulgated regulations to protect workers from fall hazards associated with roof openings by enforcing 29 CFR 1910.23 and 29 CFR 1926; the full text of both are available at www.osha.gov. (29 CFR 1910.23 applies to “general industry,” which means it applies to building owners who send maintenance workers to roofs through hatches, for example. 29 CFR 1926 specifically applies to construction workers, such as roofing workers, who must be protected from holes on roofs according to 29 CFR 1926.501 (b)(4).)

29 CFR 1910.23 applies to every type of opening, including roof hatches, and states: “Every ladderway, 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.”

To address this, many manufacturers offer railing systems that can be installed around roof hatches as a way of providing fall protection. Because railing systems are permanently affixed to roof hatches, it is not necessary for maintenance personnel to close a hatch cover when on a roof if a railing system meets OSHA requirements. There may be times a roof hatch cover must be closed under 29 CFR 1926 to prevent tools or objects from falling on workers below the hatch opening.

A railing system should be equipped with a self-closing gate or safety chain enclosure to meet OSHA standards to protect the railing system’s entrance. The main difference between a safety chain enclosure and self-closing gate is that the former requires personnel to latch the chain to maintain the safety barrier.

OSHA stipulates a safety chain must afford protection “at least as effective as” a swinging gate. An interpretation of 29 CFR 1910.23 recognizes the use of safety chains in lieu of a gate if the chains provide protection that is at least as effective as the gate.

Regardless of the method chosen to protect the railing system’s entrance, 29 CFR 1910.23 lists the following requirements for railing systems:

• A smooth-surfaced top rail at a height of 42 inches nominal above the floor, platform, runway or ramp
• Strength to withstand at least 200 pounds of top rail pressure

In addition to these OSHA requirements, it is important to consider the features and benefits developed by manufacturers for hatch railing systems. Some common factors to consider when choosing a railing system are:

• The design should allow the railing to fit on the vertical leg of the frame of any brand of roof hatch without penetrating the roofing material. If designed otherwise, the installation of a railing might result in a potential leak path.
• Installation should be simple and require only basic hand tools with no installation training or certification necessary.
A railing attachment system should allow easy installation and adjust to accommodate various mounting conditions.

The railing system should be constructed of corrosion-resistant materials such as stainless steel, aluminum, or fire-retardant and fiberglass-reinforced polymer to protect against the elements and reduce maintenance.

The roof hatch manufacturer should provide a warranty to ensure product quality.

The roof hatch industry also has made products available to complement railing systems for additional worker safety. One such product is a ladder safety post, an extension device that permanently mounts to the top two rungs of a fixed ladder. It provides a steady handhold that enables a worker to enter or exit an opening in an upright, balanced position. This type of product should feature adjustable mounting hardware to accommodate any ladder rung size or spacing.

An important component

Roof hatches are an important part of any commercial building and provide access to roof areas for a variety of purposes. Careful selection of a roof hatch, including its construction material, ease of operation, safety features and any necessary options, will determine its service life and required maintenance.

Although roof hatches are of great convenience to personnel who work on rooftops, they can create a hazard when left open and unattended. To ensure worker safety, it is important you understand OSHA regulations regarding fall protection and roof hatches. In addition, some roof hatch manufacturers provide OSHA-compliant safety devices and can help identify which products are best-suited for use with specific roof openings. Specifying proper roof hatches and code-compliant safety equipment is paramount to making rooftop environments safe, comfortable places to work.

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