

# Making the Case for Metal Roofs

By Ronnie Wendt, Contributing Writer

Managers see benefits through fewer replacements, improved sustainability

Despite the availability and popularity of metal roofs, shingled roofs remain the more popular choice for many commercial building owners and facility managers due to their cheaper upfront costs.

However, being aware of the inherent advantages of a metal roof will quickly change this perception. With its durability, energy efficiency and minimal maintenance requirements, metal roofing quickly pays for itself, says Richard Off, senior architect for Hoffmann Architects + Engineers.

Off's specialty is historic building restorations, where façade systems, roofing systems and windows are often a concern. In a recent New York restoration project, the firm replaced the batten-seam copper roof of an 80,000-square-foot university building.

Though Off admits most commercial building roofing projects do not involve copper for historic preservation purposes, he suggests there are many advantages to selecting a metal roof. The greatest of which is the resiliency and durability of the material.

"One of the biggest reasons to choose a metal roof is longevity. There are metal roofs in Europe, especially copper roofs, which date back to the Middle Ages," he says. "In Philadelphia, there are metal roofs as old as the 1700s."

In contrast, a shingled roof must be replaced every 15-30 years, with the exact time-frame dependent on shingle quality.

"If you opt for a metal roof, chances are it will be there for as long as you live, own or work in the building. A metal roof is a roof for life," he says.



A metal roof installed at Lupton Hall at SUNY Farmingdale in New York.

HOFFMANN ARCHITECTS + ENGINEERS





A painted aluminum roof on a remaining portion of an historic structure of the former Audubon Ballroom in Manhattan.

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### Consider the slope

Most roofs fall into one of two groups: hydrostatic roofs, also called low-slope roofs, and hydrokinetic roofs, steep-slope roofs.

“The fundamental difference between the two is how they shed water,” says Bob Zabcik, technical director for the Metal Construction Association (MCA). “A hydrostatic roof must be tested and built in a way to withhold ponded water, whereas a hydrokinetic roof is designed and built to keep water moving across the roof surface, so it doesn’t intrude in the building.”

Both roof types can benefit from metal construction, Zabcik maintains.

“Metal is not the material of choice for a completely flat roof. There needs to be some slope for a roof to be done in metal,” says Jeff Henry, MCA executive director.

Off recommends having a roofing contractor field verify the roof to determine if it has enough slope to accommodate a metal roof, as many roofs considered “flat” actually have a slight slope and a flat seam system fully sealed may be possible depending on the configuration.

A snow guard or fence system is also necessary for steep-slope roofs in snowy regions, Off adds.

“When a metal roof gets warm, snow will slide off of it,” he says. “You don’t want massive piles of snow falling off in areas where people are walking or have their cars parked. You also want to protect roof drainage systems, because metal roofs typically rely on gutters versus internal drains. You don’t want those gutters blocked off or clogged up by extensive snow and ice.”

### Pick a metal

Metal roofs are sustainable and durable because they are made from recycled and recyclable materials, Zabcik adds. The materials used for metal roofs include:

**Galvanized steel:** One of the most common types of metal roofing, this material comes in a variety of styles and color options. Galvanized steel can last over 40 years. However, it can be more susceptible to corrosion than copper.

**Aluminum:** Both versatile and affordable, aluminum roofing material also comes in many color options. The panels are lighter than steel, which makes them easier to install and less expensive to manufacture. On the downside, the material doesn’t last as long as steel and may need more maintenance.

**Copper:** This material is popular because it resists rust and corrosion and can last a lifetime. Copper also develops a patina over time, making it a striking element of building design. The catch is that this material is expensive, so it’s not a practical option on many commercial buildings.

Each roof material also has specific applications, adds Off. For historic roof repairs or replacements, copper is the recommended material, but for building owners looking to save money, aluminum or steel are cheaper alternatives.

“The biggest thing to consider when choosing steel is how it’s treated and where the building is located,” he says. “If it’s in a coastal area near a body of salt water, steel may corrode more rapidly than aluminum, which is naturally corrosion resistant!”

He also recommends applying a pro-

TECTIVE COATING to make the material more resistant to corrosion.

“Most people dislike the mill finish of steel, so they put a powder coating on it already,” Off says. “A fluoropolymer powder coating comes in a variety of colors and will help protect the metal and increase its service life. There are also high-end coatings and installation techniques that can maximize the coating longevity. There is concern that if the coating is not maintained and deteriorates, the metal will be exposed. And if steel is exposed, it will corrode.”

Besides coating it, steel can also undergo galvanization, which involves hot dipping it in zinc to prevent corrosion. There is also Galvalume steel, which coats steel with aluminum and zinc to increase its corrosion resistance.

“The most popular product in terms of market share is galvanized steel,” Henry adds. “But I also see a fair amount of aluminum and copper, which forms its own protective coating as it oxidizes.”

### Choose a color

A metal roof is often a personal decision made by building owners, designers or facility managers to complement the building’s aesthetics. However, certain color choices can also impact building performance, according to Zabcik.

Color can be code driven by the Solar Reflectance Index (SRI), a metric used in building codes to compare the “coolness” of roof surfaces. The SRI is calculated from solar reflectance and thermal emittance values. The higher the SRI, the cooler the roof will be in the sun, Off adds.

“A light-colored roof will reflect more light and protect the building from solar heat gain, which will make it more energy efficient,” he says. “Most metal roofing can reduce energy use, as even a raw metal will reflect infrared light. Reflecting infrared radiation helps reduce solar heat gain on buildings whether the metal is coated.”

Off emphasizes that while energy savings can lead to monetary benefits, the biggest savings with a metal roof comes from fewer roof replacements.

“There will be more material costs and labor costs initially because there is a higher level of craftsmanship involved, but you will only have to replace the roof every 50 to 100 years as compared to 20 years,” he says. “That’s where the major savings comes in.”

Zabcik underscores how often a shingled roof will need replacing throughout a span of 50 to 100 years. “You might replace a shingled roof three to five times over that life cycle,” he says. “Someone recently told me that every time you have



to re-shingle a roof, the cost is double. Even if you only re-shingle that roof two times, you can see that metal becomes a much cheaper alternative."

Plus, as companies focus more on sustainability, a metal roof is better for the planet. A large quantity of landfill space is taken up by outdated roofing materials each year, he reveals. In contrast, metal roofs are highly recycled.

"We focus a lot on carbon when we talk about sustainability," Zabcik says. "But that's just one piece of sustainability. When you avoid putting obsolete roofing materials into a landfill, you are making an enormous impact."

### Double-check standards

Making sure the metal panels used pass applicable standards is vital for a long-lasting roof. Building codes dictate metal roofing materials pass certain standards to ensure their structural capacity, especially with hydrokinetic roofs, according to Zabcik.

He explains a metal roof with a struc-

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tural deck underneath requires the metal to meet UL 580 standards, which tests the roof's ability to stay together under varying pressures. The TAS 125 standard also tests the metal's structural integrity and the deck underneath it under load.

There is also the ASTM E1592 test, which puts a load on the underside of the metal panel.

"ASTM E1592 applies when there is no deck because the metal panel will take the entire load from both the wind and the pressure inside the building because it is not split with a deck," he says. "Manufacturers spend a great deal of time and effort and money testing and producing materials to these standards. They made that investment and it's part and parcel with the long-term performance of the metal roof."

Since the metal materials hold up best when installed to a manufacturer's standards, Zabcik encourages building owners to select an OEM-certified contractor. "There are so many products and paint systems available, so you need to know what

you are purchasing and putting on your roof," he says. "But you also want to do your due diligence once you select a product and make sure that whoever installs it is trained and capable."

Off also stresses the importance of hiring a skilled professional for metal roof installation.

"You want them to have at least five to 10 years of experience in metal roofing, preferably in that type of metal or metal system," he says. "While metal roofing has

historically relied more upon years of field experience, check to see if the installers are certified by the manufacturer. There are many suppliers out there who have certification requirements for installers to make sure they are doing it right." ■

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