



“Up On Top” Newsletter

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Lightening Protection Systems

Lightning-protection systems commonly are installed on roofs located in areas prone to frequent lightning strikes. Although roofing contractors typically do not install lightning-protection systems, when such systems are integrated inadequately into a roof system or not maintained, roof-related problems can arise and the lightning-protection systems may be rendered ineffective.

The most common lightning-protection system is the traditional Franklin rod system, which is based on the lightning rod Benjamin Franklin invented in 1752. This type of system does not prevent lightning from striking a building; rather, it controls a lightning strike and prevents damage to nonconducting parts of a building by providing a low-resistance path for the discharge of lightning energy.

The Franklin rod system consists of placing air terminals (commonly referred to as lightning rods) around a roof's perimeter (and also in the field of the roof on large roof areas) and along ridges of steep-slope roofs. The air terminals are connected with either copper or aluminum conductors, or cables. Metal bodies, such as mechanical equipment and roof hatches, often need to be "bonded" to a lightning-protection system by secondary conductors connected to the primary conductors that interconnect the air terminals.

Conductors are attached to a roof and/or parapet with various types of connectors, or clips, spaced at a maximum of 3 feet on center. The roof conductors are connected to through-roof or through-wall connectors, which are specially made bolted assemblies. Down conductors are connected to the interior side of through-

roof or through-wall connectors and then connected to ground rods.

When inadequately integrated into a roof system, a lightning-protection system can damage the roof and/or no longer be capable of providing lightning protection. For example, bitumen displacement can occur in hot climates when conductors rest directly on smooth or mineral-surfaced built-up or modified bituminous membranes. The conductors can sink into the membrane, thereby displacing the bitumen above the reinforcement. Bitumen displacement has the potential to shorten a membrane's service life.

Roof surface abrasion also is a concern. Conductors resting directly on a roof surface can abrade it. On metal roofs, abrasion can result in loss of corrosion protection and subsequent corrosion-induced penetration of the metal. Loss of protective granules or wearing away of polymer matrices can shorten a roof's service life. Surface abrasion can be accelerated if the distance between conductor connectors is excessive because of a lack of connectors or a connector was not attached to or becomes detached from the roof.

When reroofing a building that has an existing lightning protection system you should have the system disconnected and reconnected by a certified lightning protection contractor that is listed by U.L. (Underwriters Laboratory). The selected contractor should also visually inspect the system each year to verify air terminal base plates and conductor connections are still attached to the roof surface and connectors are still engaged to conductors.

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