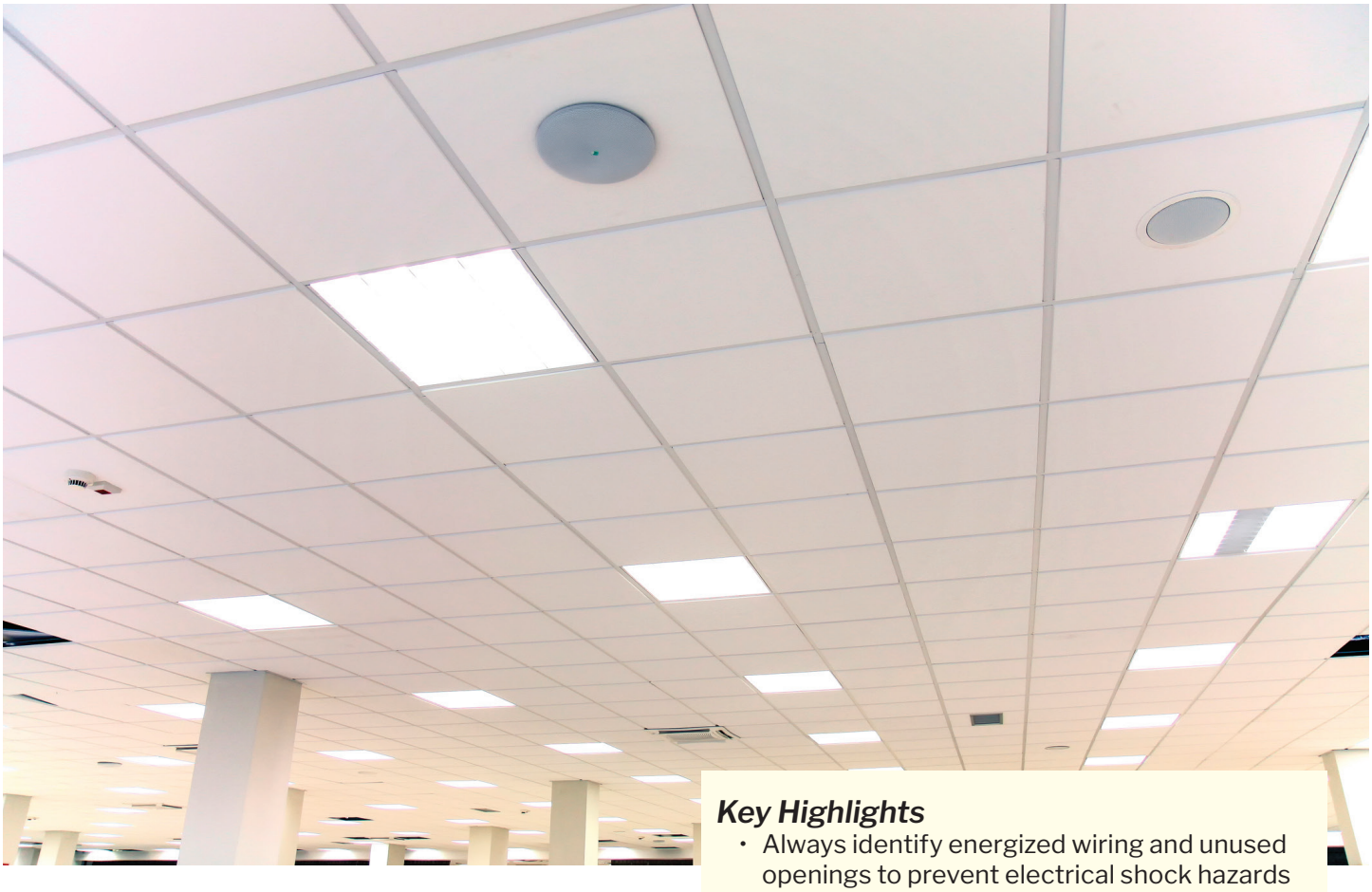

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Safety Concerns for Electrical Work in Commercial Ceiling Spaces

The ceiling spaces in today's commercial buildings are increasingly crammed with circuits and equipment. Do you know how to access them safely and stay safe while working on them?

by Mark Lamendola

Key Highlights

- Always identify energized wiring and unused openings to prevent electrical shock hazards and ensure Code compliance.
- Use the correct ladder or scaffolding, inspect equipment beforehand, and avoid relying solely on tags for fall safety.
- Maintain proper work level to reduce neck and shoulder strain.
- Wear appropriate respiratory protection, such as N95 masks or HEPA filters, especially when dealing with fine dust or fibers.
- Keep safety glasses on at all times, use anti-fog solutions if needed, and ensure adequate lighting in tight ceiling spaces.

Ceiling spaces are often right above office spaces where people are working without personal protective equipment (PPE) or any concern for their safety. Don't let that lull you into a false sense of security. Working in a ceiling space can be dangerous. So how can you protect yourself?

Protect against shock hazards

Before placing any part of your body into the space — much less entering it — identify energized wiring that is 120V or greater. This should be fairly easy to do. Then

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identify any unused enclosure openings or exposed terminations. You should not have to unplug anything or go through lockout/tagout unless these hazards are in your intended work area. Make a note of their location and also note what needs to be addressed. Unused enclosure openings violate 110.12(A) and thus are Code violations. What other Code violations can you readily spot? For example, SO cord is prohibited for use in these spaces. If you see one Code violation, there are probably others.

If you see Code violations in your immediate work area, consider that area an unsafe work location. You will need to render it electrically safe per NFPA 70E, Art. 120, which means unplugging things and/or going through lockout/tagout. If this wasn't expected, inform your foreman and get the okay from the operations manager or similar facility contact before proceeding. If they insist you proceed without establishing an electrically safe work condition, then you have to go with a hot work permit per Article 130.

Protect against fall hazards

There is almost no chance to use fall protection in these spaces. Fall safety is usually a ladder safety proposition.

- Use the right size ladder for the job. Using the wrong ladder just for a minute can mean years of physical therapy or even paralysis.
- Use the ladder correctly. That means, for example, not standing on the top step. It may also mean, depending upon the ladder, not standing above the "Do not stand above this line" tag of the ladder.
- Sometimes, these jobs involve scaffolding instead of ladders. Don't rely entirely on the scaffolding tag; inspect the scaffolding yourself. If you're not a qualified person, at least use your smartphone to find some basic tips online and perform that minimal inspection. If you're unsure about the scaffolding or see something that doesn't look right, run the issue past your foreman before using the scaffolding.

Protect against neck and shoulder injuries

Your shoulder sits in a girdle of three muscle bundles: front deltoid, lateral deltoid, and rear deltoid. It's normal for the rear deltoid to be weak relative to the rest of the shoulder, resulting in a joint that isn't stable.

People who are glued to their phones or computer screens all day neck strain from looking down. Electricians doing overhead work get neck strain from looking up. In either case, the strain can be greatly reduced by having the work level with your eyes or your eyes level with the work. Pausing occasionally to gently rotate your head (and also move it in the opposite direction from which you've been using it) will reduce neck strain by relieving the tension built up in the neck.

Protect your lungs

If the space has a lot of fibers (for example, acoustic or thermal insulation), a standard N95 mask will offer sufficient protection as long as it fits snugly and you don't stir too many of those fibers into the air. But the smaller particles, that mask will be less effective. It is rated to block "up to" 95% of particles 300 nm or larger. That's a lot of ifs regarding particles. If there's much fine dust, either wear a canister respirator or use a HEPA vacuum to remove the dust prior to working in that space.

Protect your eyes

Removing your safety glasses so you can see better is not smart. If it's hard to see, that's the last thing you want to do. These spaces are tight and could easily have a large quantity of eye hazards jammed into them. If your glasses fog up, perhaps because you are wearing a respirator, treat them with an anti-fogging spray or solution. There is nothing you can spray on a punctured eyeball to restore vision. So, go with the anti-fogging spray rather than go without eye protection.

Still can't see? Light the area up. Many portable lights today use lithium batteries and have innovative means of mounting and attachment. Most offer magnetic mounts and some type of hook or strap.

Mark Lamendola is an expert in maintenance management, having racked up an impressive track record during his time working in the field. He also has extensive knowledge of, and practical expertise with, the National Electrical Code (NEC). Through his consulting business, he provides articles and training materials on electrical topics, specializing in making difficult subjects easy to understand and focusing on the practical aspects of electrical work.

Prior to starting his own business, Mark served as the Technical Editor on EC&M for six years, worked three years in nuclear maintenance, six years as a contract project engineer/project manager, three years as a systems engineer, and three years in plant maintenance management.

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Mark earned an AAS degree from Rock Valley College, a BSEET from Columbia Pacific University, and an MBA from Lake Erie College. He's also completed several related certifications over the years and even was formerly licensed as a Master Electrician. He is a Senior Member of the IEEE and past Chairman of the Kansas City Chapters of both the IEEE and the IEEE Computer Society. Mark also served as the program director for, a board member of, and webmaster of, the Midwest Chapter of the 7x24 Exchange. He has also held memberships with the following organizations: NETA, NFPA, International Association of Webmasters, and Institute of Certified Professional Managers.