

## **Workmanlike Manner**

by Dean K. Wilson, P.E.

**Question:** A county electrical inspector just left one of our job sites. He filed a defect report on our fire alarm installation. He claims we did not install the system in a workmanlike manner. Where did we go wrong?

*Answer:* Without the opportunity to come to your job site, walk the premises, look at every nook and cranny, and check your installation thoroughly, I can only guess why he chose to file this defect report. My immediate temptation, based on many years of experience, prompts me to want to celebrate that this particular electrical inspector had the courage to insist on a quality installation. I realize this makes me seem far less than sympathetic to you, as the installing contractor, so let me set aside my natural inclination and try to address what may constitute the heart of the matter. After all, what is a “workmanlike manner?”

NFPA 70-2005, *National Electrical Code*, offers these requirements:

**110.12 Mechanical Execution of Work.** Electrical equipment shall be installed in a neat and workmanlike manner.

FPN: Accepted industry practices are described in ANSI/NECA 1-2000, *Standard Practices for Good Workmanship in Electrical Contracting*, and other ANSI-approved installation standards.

**(A) Unused Openings.** Unused cable or raceway openings in boxes, raceways, auxiliary gutters, cabinets, cutout boxes, meter socket enclosures, equipment cases, or housings shall be effectively closed to afford protection substantially equivalent to the wall of the equipment. Where metallic plugs or plates are used with nonmetallic enclosures, they shall be recessed at least 6 mm (1/4 in.) from the outer surface of the enclosure.

**(B) Subsurface Enclosures.** Conductors shall be racked to provide ready and safe access in underground and subsurface enclosures into which persons enter for installation and maintenance.

**(C) Integrity of Electrical Equipment and Connections.** Internal parts of electrical equipment, including busbars, wiring terminals, insulators, and other surfaces, shall not be damaged or contaminated by foreign materials such as paint, plaster, cleaners, abrasives, or corrosive residues. There shall be no damaged parts that may adversely affect safe operation or mechanical strength of the equipment such as parts that are broken; bent; cut; or deteriorated by corrosion, chemical action, or overheating.

As you can see from a careful reading of these requirements, the *National Electrical Code* anticipates that any electrical installation, including the installation of a fire alarm system, will meet certain standards of installation practices. A good friend for many years, Bob Gilmore, often described “workmanlike” as “the kind of work a journeyman electrician will perform when he knows the foreman plans to evaluate him for his annual salary review.” Now, of course, Bob had a merit employee in mind, but you get the point. Workmanlike means the very best and most professional work that an installer can perform.

Typical items I have found during my 41 years of inspection experience include improperly bent conduit, improperly secured conduit or cable, covers missing from junction boxes, lack of proper fittings where cables enter boxes, improper labeling or lack of labeling of circuits, improper termination at junction points or terminal strips, improper sizing of overcurrent protection, poor mounting of physical hardware, to name just a few.

Most contractors could prevent problems with inspectors if they would just take a long, hard, and careful look at each job. They should ask themselves if the job represents their very best work. Would you be proud to show this job to your most severe critic? If not, what do you need to fix to make this job meet the high standards you know within your own heart that you should hold onto for your work?

Not long ago, I looked at a dozen new houses. Every house looked close to spectacular on the outside: beautiful design, striking paint job, well-manicured lawn, no visible flaws whatsoever. Even a superficial tour through the rooms of the houses gave one the feeling that each house represented excellent workmanship. A walk through the basements told a very different story. One house in particular stood out from the rest. In that particular basement the most careful and prudent master mechanic would have smiled broadly. The subcontractors had laid out all of the ductwork, all of the piping, and all of the electric cables in straight lines.

The ductwork for the HVAC looked as if someone had spent a great deal of time making certain each connection was placed in perfect harmony with the surrounding space. The ducts all had labels indicating the part of the house they served.

Inside the main electrical cabinet, all circuits had descriptive and professionally prepared labels. Each circuit had a wire number. The electrician had posted a list of wire numbers next to the cabinet for all of the power circuits, all of the telephone circuits, all of the computer circuits, all of the security system circuits, and all of the fire alarm system circuits throughout the house. The list told where each circuit began and where each circuit terminated. Even the door bell circuits had wire numbers on them.

The plumber had similarly labeled each pipe with information about its origin and destination. Wow! What an amazing job.

Did this take time? You bet it did. Was it worth it? Of course it was. No one working on this house would ever have to spend time trying to figure out where a wire or pipe or duct began or ended. Workmanlike, indeed!

The only true measure of any installer's work derives from the impression that work makes on anyone who looks critically at the job. To have an electrical inspector or fire marshal look at a

fire alarm installation and say, “Well done!” gives any contractor a feeling that he or she has certainly heard high praise.

So, I do feel some sympathy for the fact that you received a defect report from the county electrical inspector. At the same time, I am very, very, very glad that he or she had the courage and professionalism to take action to help make certain this installation and future installations meet the requirements of the *Code*.

I encourage you to learn from this experience and elevate your standards. Your customers will certainly benefit. And, in the end, you will benefit, too.

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