

Carefully Planning the Design/Build

by Dean K. Wilson, P.E.

***Question:* A long-time customer has recently bought an old factory building and intends to remodel it into a production facility. Because we have a very satisfactory business relationship, the owner has asked our firm to design and install a complete fire alarm system for the renovated plant. Can you offer any suggestions on how to avoid common pitfalls?**

Naturally, I prefer to have all fire protection system designs come from a knowledgeable fire protection engineer. Or, at the very least, to have a fire protection engineer review the design of a skilled technician.

But, I also recognize that a technician who has completed the rigorous certification program of the International Municipal Signal Association (IMSA), or who has met the Level IV fire protection/fire alarm system qualifications of the National Institute for Certification in Engineering Technologies (NICET), may also have the knowledge, insight, skill, and understanding to produce a credible fire alarm system design.

The key to avoiding most of the pitfalls in creating such a design rests with careful planning. Spend all the time you need to thoughtfully consider every detail of the design, even before you begin to put pen to paper. Once you begin to sketch out the preliminary design, take time to study the location of cable runs and equipment locations.

Don't leave anything to chance. Even if your firm will rely on an electrical contractor to install conduit or pull cabling, make certain your design reflects the optimum location for those conduits and cable runs.

Assign a number to every conductor. Provide detailed drawings of every termination. Plan the location of ancillary power supplies and other field-located equipment. Leave nothing to chance. Specify mounting heights for all equipment. Consider the need for extra space that any future expansion of equipment may require.

Select equipment with consideration for later expansion. Even if you do not choose to install visible notification appliances in every room in the building, make provision in your wiring plan for the cabling necessary to connect such appliances at a later time. Then, if a hearing-impaired person is hired, the owner can easily add a visible notification appliance in the spaces where that individual will work.

Make provision for point identification of all initiating devices. Public Proposals have already been made to the Technical Committees working on the draft of NFPA 72-2013, *National Fire Alarm and Signaling Code*[®], that will require the transmission of point identification information for each initiating device to any supervising station. Don't shortchange the owner of this property by failing to make provision for such a future requirement.

Carefully determine which type of initiating device will best provide the necessary detection. Likewise, carefully determine which type of notification appliance will best provide the necessary notification. Take into consideration all furniture, storage racks, cranes, industrial trucks, machinery, conveyors, and all other materials handling equipment that might interfere with the location of the fire alarm system devices and appliances.

Make certain you carefully review the heating, ventilating, and air conditioning equipment design drawings to determine the necessary location of smoke detectors for air handling system shut down. Know which dampers the fire alarm system may need to operate.

By focusing your attention on careful planning, not only will you help ensure that you won't miss any critical detail, you will also make certain that the solutions your design provides will have the most cost-effective outcomes.

Plan the size of various power supplies to account for possible future expansion. Make certain that integral battery chargers have the capacity to serve larger batteries should they become necessary at a later time.

Make certain you carefully consider the kind of information that will be most useful to the emergency responders when you design the remote annunciator. Does the wording of the display make sense? Have you provided a diagram of the facility that will help the emergency responders quickly locate the actuated initiating devices during an emergency? Have you standardized your annunciation to comply with that commonly used in the particular jurisdiction?

In every aspect of your design, make certain you carefully reference the requirements of the building code adopted by the jurisdiction, the requirements of NFPA 72-2010, *National Fire Alarm and Signaling Code*[®], and the requirements of NFPA 70-2011, *National Electrical Code*[®].

Then, document your design both in writing and by use of appropriate drawings. When in doubt, provide more information than you think people might need, rather than providing less information. The more thorough your documentation, the more likely that other tradesmen will properly execute your design.

Once you have completed your design, have someone you trust review that design. Let his or her fresh eyes pick up anything you may have overlooked. This step is critical. Have your

reviewer treat your design as if he or she was the Authority Having Jurisdiction. Then, ask your reviewer to play the role of an installing contractor. In each case, has your design provided all the necessary information? Has your careful planning resulted in the most efficient installation? Have you met the overall fire protection goals of your customer? Have you created a cost-effect design?

Once you have invested the time to carefully plan and execute the fire alarm system design for your customer, you will have the satisfaction of knowing that your diligence has helped maximize your customer's investment and given him or her a design that will help preserve and protect the renovated facility.

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