

## The Future Of Design Is Here!

By Joe Reghetti

**F**aster than a speeding bullet, able to design tall buildings in a single day... No... It's not a legendary superhero or your favorite video game, but the latest 3D CAD technology.

Long gone are the days of the tedious drafting pencil. In the 60s, drawings were done on a drafting board and used a schedule for pipe sizing. The few hydraulic calculations that were needed were all done by hand.

The 70s introduced the sophisticated adding machine. This used magnetic cards that required the drafter to cut and tape each piece of information onto an 8½" x 11" page, to be copied for submittal.

Slowly but steadily, the evolution began. At first, using CAD was not much of a departure from the old method. Instead of pencil, the drafter used a digitizer pad and viewed his work on a monochrome monitor. The process was still a symbol-by-symbol, line-by-line method. Most hydraulics was done using stand-alone programs with nodes manually added to the computer drawings.

By the mid 80s, people got the idea that perhaps the computer could be programmed to do the calculations and measurements automatically as the lines were being drawn. And, expanding on this idea, why not count up the symbols and produce a material list? These programs were all "line" based and seemed to show well on simple buildings for industry trade shows, but failed miserably on real world projects, such as hospitals and nursing homes. If errors existed anywhere in the system, the program could not function further until *all* were found and corrected.

To overcome these problems, a few software developers started working with a relatively new technology called "3D Modeling." A handful of companies

began marketing software packages with specialized macros tailored for the sprinkler industry. Most sold, with associated hardware, from \$50,000 to \$75,000. Even at this cost, the programs were limited, difficult to use, and provided disappointing results on paper.

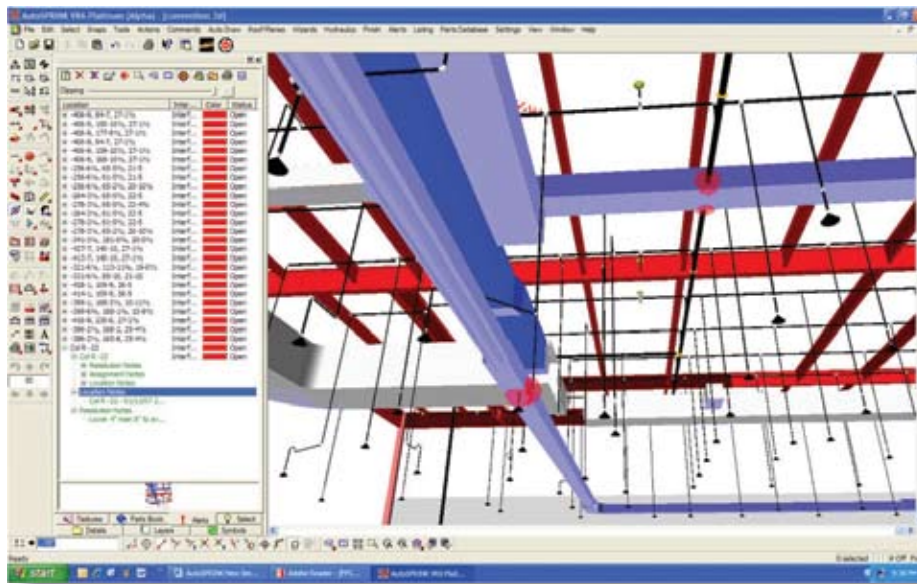
Today, with most major CAD developers employing artificial intelligence and highly sophisticated object-oriented drawing elements, there is finally a solution. Employing one of these engines, in an easy to use, 3D fire sprinkler design program, will effortlessly produce automatic, interactive,

hydraulic calculations and material lists. This is accomplished instantly and accurately from the system model utilizing the "internal intelligence" of each system component.

This ability is nothing new and has been a reality for several years in some programs. The emphasis now is on increasing speed,

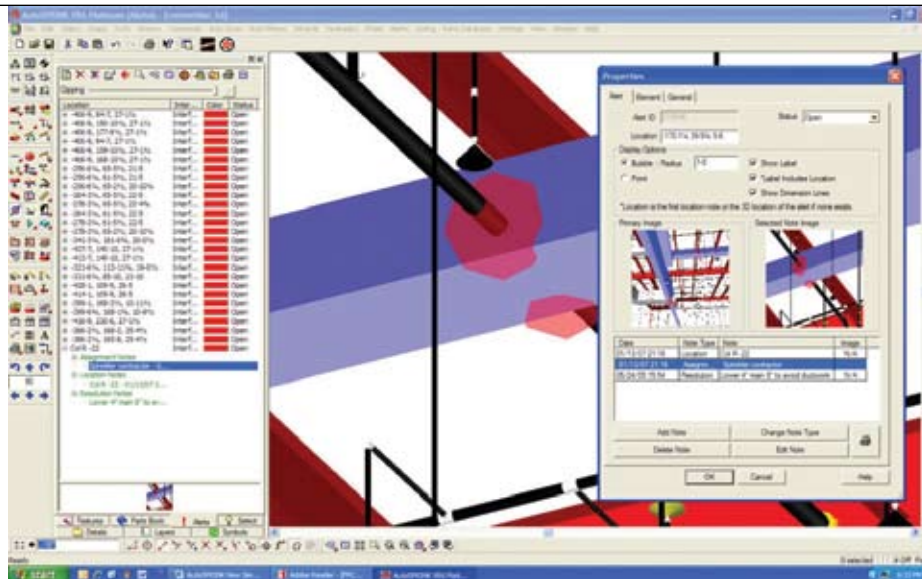
accuracy, and producing high quality drawings that graphically convey design concepts to both reviewing authorities and, most importantly, installation crews.

After all, isn't the main goal getting a comprehensive, accurate system design to those who have to install it? Combining that goal with having it "on time" should be the foundation of any profitable fire sprinkler company. In today's fast paced, understaffed, demanding world, this concept seems to be overshadowed by tailoring the design drawing more toward meeting the needs of approval agencies and consultants. Most designers now come from colleges and universities, with little or no field experience. Consequently, they fail to fully understand that what they are designing needs to be installed in a real



*"You can define all conflicts and establish location for each. The interference checking feature of these programs can define any and all trade conflicts with structure and/or each other."*

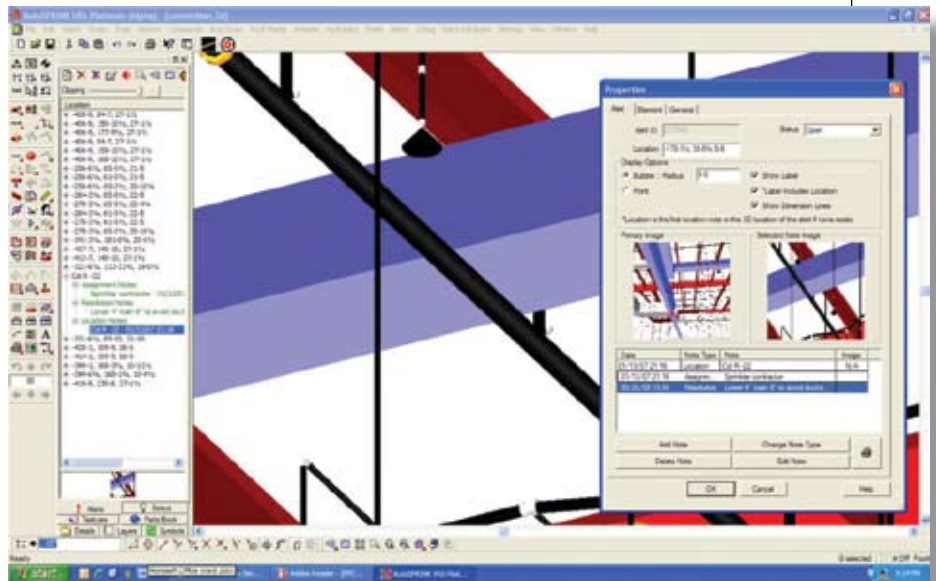
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*Assign conflict responsibility for all attendees to resolve for the next meeting. The program can even print out action sheets with color illustrations for each trade involved, including directions and dimensions.*

***Resolve the Conflict —***  
*You now have the best tool ever to “negotiate work” with any general contractor who wants to minimize change orders, reduce cost overruns to his client, and BE ON TIME!*

*Moreover, users are negotiating Mechanical/ Electrical/Piping (MEP) coordination as an additional contract with the advantage of actually controlling the coordination effort.*  
***What a concept!***

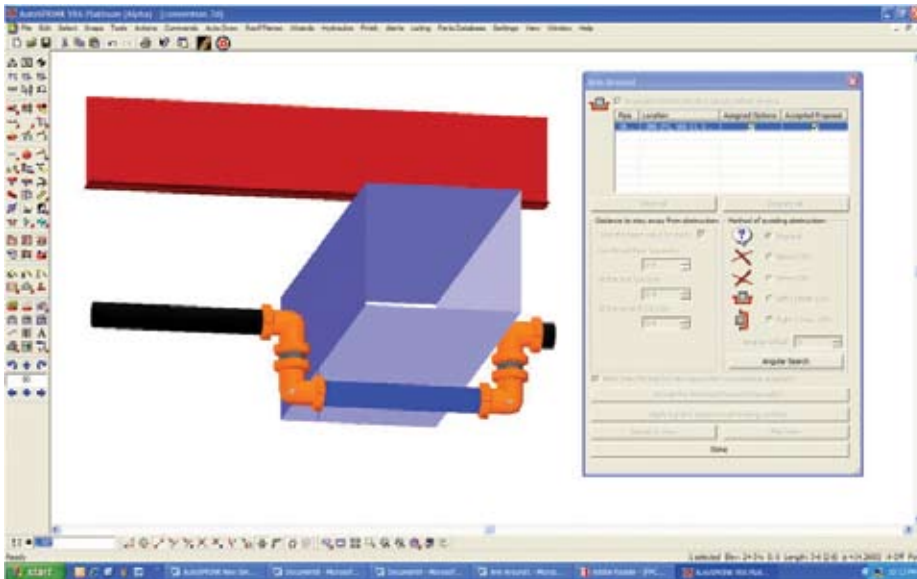
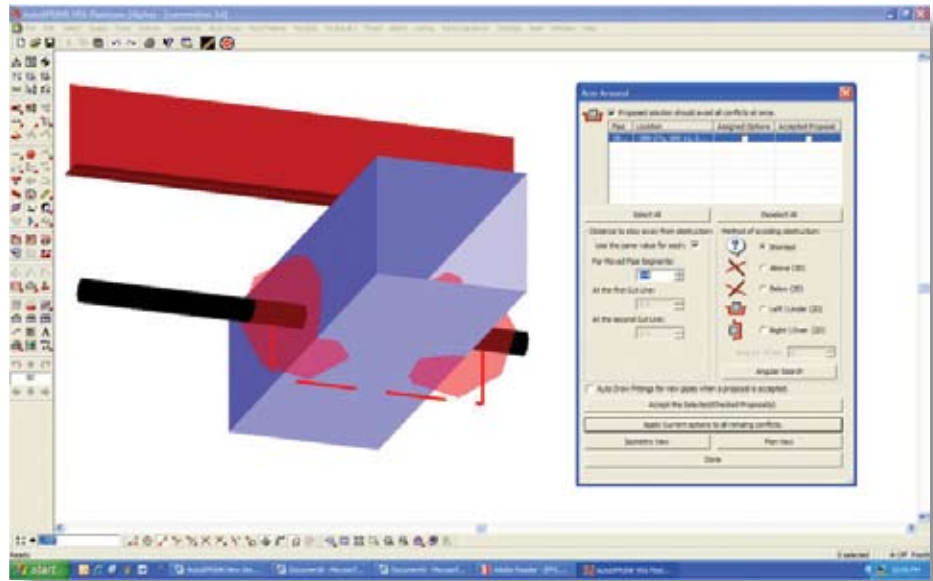


*The latest advances even include automated commands that automatically resolve conflicts throughout the system: conflicts can be resolved individually or cleared for the entire length of the pipeline to clear all obstructions at once. There is also an option to add fittings and re-cut pipes automatically as you go.*

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world building by crews who depend on them to “fit” the building accurately. The most effective way to do that is with a three-dimensional model of the project, of not only the fire sprinkler system, but also of the entire building, including structure and other trades.

Without a completed building to collect the necessary field measurements, this is the only effective way to produce the end result we’re all looking for; an extremely accurate design, graphically detailed enough to reduce field labor costs by unprecedented amounts. This is not only possible, but also more economical than utilizing the out-



installations. Depending on the level of detail you wish, the mere click of the mouse can produce vivid color displays or printouts of any system complexity. Conflicts with the structure and/or other trades can be instantly defined and documented for use in coordination meetings.

So what is next? Where will we go from here? Just use your imagination...

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dated, 2D “line based” programs used for the last 20 years. The new modeling programs are exceptionally user friendly and have the ability to accurately convert simple, line-based drawings into intelligent objects that depict real world building elements. Roof planes can be established from structural drawings and, in minutes, automated tools can create a real world model with as much or as little detail as desired.

A bonus is the ability to virtually walk through the building as if you were the installer. You can get realistic depictions for detailing, which are hard to distinguish from actual pictures taken of finished

