

# The Model Plumbing Code: A Limited Design Tool

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A mechanical engineer once told me the plumbing code is the best source for plumbing system design knowledge. He also said the plumbing code adopted in our state has the necessary tools to design all plumbing systems, including domestic water systems, drainage systems, roof-drain systems, and fuel-gas systems. As we discussed the issue, this engineer stated that the plumbing code includes every specific requirement for sizing all plumbing systems. As an example, he used the water pipe sizing table shown in the appendix. He also referenced the fuel-gas tables.

## Designers and Reality

In reality, the International Plumbing Code, the Uniform Plumbing Code, and even the National Standard Plumbing Code provide minimum design guidelines; thus, they are very limited design tools. Designers who use the plumbing code to design a plumbing system are restricted by the limits of the plumbing code's tables and topics.

For example, the plumbing code lists copper and steel as the only water-piping materials for sizing water piping. The only pipe sizing tables included are for copper tubing, fairly smooth pipe, fairly rough pipe, and rough pipe. None of the model plumbing codes have water-pipe sizing tables for plastic piping, including PEX, PVC, or CPVC. The plumbing code does not include correction values to modify the infor-

mation in the tables for use for other materials, nor does the code explain which graph should be used for other materials. In fact, the Uniform Plumbing Code restricts water-pipe sizing to fairly rough pipe and rough pipe sizing tables if you have water that will degrade the piping system over time.

In addition, the drainage sizing tables in the model plumbing codes are limited to one material. There are no differences in sizing based on the pipe material's friction factor. The two major model plumbing codes' fuel-gas pipe sizing tables are limited to 300-foot equivalent length. They don't contain pipe sizing tables for compressed-air or medical-gas systems, requirements for sizing sump basins, nor pipe sizing tables for controlled-flow roof-drainage systems or symphonic roof-drainage systems.

The International Plumbing Code and the Uniform Plumbing Code are based on many engineering principles. The water-pipe sizing tables are based on the Hazen-Williams Equation and the drainage sizing tables on the Manning Formula. Plumbing designers must know the plumbing code, but they also must know the engineering principles behind the code's sizing tables. Many times in plumbing system design, the tables in the plumbing code do not work. When designers use different piping materials, they also must use new tables or formulas. When the system is so large that the tables in the

plumbing code cannot be used, the plumbing designer must revert back to the basic formulas. I know of many plumbing design engineers who have created their own tables to deal with large plumbing systems.

The plumbing designer has a responsibility to know the basic engineering principles that are used in the plumbing code. By knowing these principles, the plumbing designer is aware of the sizing tables' applications and limits and can use the formulas to better determine what the proper pipe sizes should be.

If the model plumbing codes truly are going to become a complete plumbing design tool, they need to contain *all* the necessary information to design *all* plumbing systems, no matter how large or small. Until then, the model plumbing codes are limited design tools. ■



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Figure 2. Dialog Box to Make a New Plumbing Layer



### 11. pj.lsp (Polyline join), Author: © Jonathan Pruet

This routine lets you select a group of lines and turn them into an open or closed polyline.

### 12. tb.lsp (Text break), Author © Yuqun Lian

This routine writes a text string to the drawing and then breaks any lines, polylines, etc. that intersect an imaginary box around the text. The text is placed on the current layer using the current style. This routine's default input and repeat capabilities make multiple labeling very convenient.

### 13. underlin.lsp (Underline text), Author: © Frank Randel

This is another routine that does what its name says. Just pick a line of text (or several), and the routine will underline it (them).

I'm sure that many more of these great time-savers exist; I would

appreciate it if you e-mailed me your favorites. By sharing these routines with others—just like belonging to ASPE—we all gain. ■



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