

The Gap Explained

Mike Smith

Sometimes I wonder how much simpler my day would be if I didn't work for a design/build contractor. I often miss being a plumber in the field. Those were the days: You put in a hard day's work, went home tired but worry free, spent time with your family, went right to sleep, and was up and at 'em the next day. I didn't stay awake at night fretting over a looming deadline or counting code changes instead of sheep.

I truly enjoy the design work I'm doing now, but I wonder if it would be easier if I worked for an engineering firm without the contracting part. Maybe then I could keep estimators, contractors, and owners at arms length while taking the necessary time to design a properly researched plumbing system. I don't know about you, but lately I seem to have less time to do more work.

I've often discussed with colleagues and coworkers the gap that exists between those who design and those who install plumbing systems. I currently am involved with a project that perfectly illustrates the gap, at least to me, and I'd like to try to explain it. This particular job seemed harmless at first, but it ultimately revealed the gap in all its glory.

I first approached this job as a pure theorist (designer). It was a renovation project. The owner had purchased two rather old buildings across the street from his downtown business, and he intended to covert the dilapidated structures into upscale apartments. He had hired a general contractor who, in turn, asked my company to design the mechanical, engineering, and plumbing systems.

The buildings were constructed in the late 1920s or early 1930s. They were three stories tall with 12-foot ceilings and flat tar roofs. I had examined the buildings when demolition was just beginning. The original plaster had reached the end of its life cycle. The demolition revealed the ancient wood framing, erected by true artisans using milled timbers as straight and true as the day they came off the saw. When I see this kind of old framing, I run up to a 2x4 or a 2x6 with a tape line and measure it. They actually measure 2 inches by 4 inches or 2 inches by 6 inches, and the corners will cut you if you're not careful. I love that!

Once the plaster walls and ceilings were removed, the plumbing system was revealed. As enamored as I was with the framing, I was even more fascinated by the plumbing. The buildings were replete with every type of pipe and then some. I'm sure that these old structures had been changed many times over the years. It wasn't hard to identify the original plumbing, or what was left of it. The lead and oakum joints were still tight. The original main soil stack and stack vents were largely intact from below grade through the roof. The branch piping had borne the brunt of the plumbing changes over the years. Cast iron pipe was mixed with ABS, PVC, CPVC, galvanized pipe, and copper tubing.

I saw several solid lead fittings, including drum traps, as well as lead piping. (Wasn't it the Romans who first used lead piping?) The buildings had been heated with steam, then with natural gas, so schedule 40 weld piping was mixed with galvanized screw pipe. All of the plumbing pipe and heating

pipe was installed with a variety of adapter fittings and transition connectors, some homemade.

As I walked the buildings I almost could trace chronologically the plumbing changes that occurred over the years. By looking at such work, one could start to understand just how ancient the plumbing trade is. I could see plumbing installation techniques that have been used for hundreds of years. I couldn't help but try to rate the skill level of those that may have installed the various piping systems. I easily could discern the work of a skilled craftsman versus that of a jackleg or so-and-so's uncle.

With the floor plans in hand, I began to mentally devise a plumbing scheme to fit the new owner's layout. All at once I found myself looking at this job as an applied theorist (installer). I realized that I was astride the gap: I had just planted one foot in the mind of an installer while keeping the other foot at the designer's desk, thereby bridging the gap.

Now I was mired in a left-brain/right-brain conflict about what to do next. My job (left brain) required me to down some quick notes, race back to the office, and quickly start some drawings. After all, the city requires permit drawings for the city engineer's review, and then I would need to make copies of the approved drawings for the owner, the contractor, and of course the plumbing foreman.

Meanwhile the installer in me (right brain) was imagining driving to the supply house with a plumbing takeoff scratched on a piece of five-quarter board found on site. Drawings? I don't need no stinkin' drawings! Just show me where the mains are and where the fixtures go and then get out of my way.

These buildings were really old. Installing a new plumbing system would require skills, old skills that you can't learn at engineering school. Despite the best-laid plans and specs, in many instances the installer would need to make field adjustments, all code compliant of course.

How to resolve this conflict? I could have chosen either direction but decided to build a bridge between the two. Will I prepare drawings? Yes. Will they be accurate? Sort of.

What I mean is this: I will produce a set of plumbing drawings that will satisfy the local code officials who then will issue the required permits. However, the plumber will be hard-pressed to rely completely on those drawings to install the system. Much of the work he will need to figure out in the field. I had observed many areas in these old structures

...continued on page 68



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