

Condensation Consternation

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Sometimes, despite one's best intentions, a design/build job goes bad. It happens for hundreds of reasons, and once you have experienced the misery of working on a job gone bad, you tend to remember it for a while. It doesn't help when other trades and mechanical systems seem to conspire against the lonely plumbing designer. Allow me to tell a short story that illustrates this.

I clearly recall the afternoon I received the note. Scrawled across a bright yellow Post-it was the name and phone number of a property manager at a project my company had designed and recently completed. I remember rolling my eyes and groaning as soon as I recognized the name and muttering, "Oh jeez! What do they want now?"

The customer was complaining of sewer gas odors, and that, despite several visits, our service department could not find the offending smells' source. I desperately tried to think of a way to avoid dealing with this problem but quickly realized the buck had been passed and stopped with me. My shoulders sagged, and I let out a sigh while walking slowly to my office to make the call. My lousy mood had nothing to do with the complaint; I love solving plumbing problems. It was the name of the project that had ruined my day.

I trust most of you have had one of *those* projects: the design job that begins normally but then suddenly changes and becomes the bane of your existence. This project had been all of that and more for me. It involved the renovation of a mid-1930s, six-story, wood and brick waterfront warehouse into commercial and residential spaces.

I can't even begin to describe everything that went wrong with this project or the incredible amount of time it took to design, estimate, redesign, re-estimate, negotiate, and renegotiate this job. The mere mention of the project in our office sends people running and hiding. Now you should understand why I was so reluctant to reenter the abyss.

I called the property manager, and she told me that two of the apartment owners had complained of sewer gas odors over the past few months. The building contained 36 apartments, so I figured the problem might not be so bad after all. Also, the odor was not present all the time, which could explain why our service personnel couldn't locate the source.

Over the years I have learned a few basic truths about sewer gas odors: The source is either a broken soil pipe or a dried-out P-trap, and when a customer complains of sewer smells, they are not making it up.

I reviewed a set of plans with which I was very familiar, looking for possible design flaws. The plans didn't reveal anything (as they usually don't), and I realized the only good way to diagnose this kind of problem was to visit the scene of the crime. I called one of the residents who had registered a complaint and arranged to meet.

After arriving at the appointed time, I introduced myself and began my investigation. The apartments were pretty basic. The exterior walls and ceilings were exposed brick and wood planks, except for the new gypsum-clad partition walls. There was an open area for the kitchen sink and appliances and a walled-in bathroom in the far corner.

I briefly questioned the homeowner, asking the usual stuff: where the sewer smells were coming from, when the odor was most intense, etc. While listening to the occupant's weak answers, I was staring at the bathroom, remembering how the architect's design had placed the air handler, water heater, and other mechanical appurtenances in a very small space above the bathroom ceiling, and the solution suddenly hit me. Wiggling my way into the tiny and cramped space, I wondered how anyone possibly could service any of the equipment that was crammed into such a ridiculously small area.

Then I found it: the 3/4-inch PVC pipe coming off the drain pan in the air handler. The condensate drain. It ran from the air handler across the bathroom ceiling and turned down into a 2-inch, cast iron P-trap. I sniffed the P-trap and eureka! I had found the culprit: a dried-out P-trap.

My satisfaction immediately was replaced by consternation because this was not how the drain was designed to be installed. The design had shown a separate condensate riser routed to a floor drain in the basement. Sometime during construction, some well-meaning soul had decided to eliminate the planned condensate riser and install individual hub-drains connected to the nearest plumbing riser at every mechanical space above the bathrooms. With the water heater and air handler stuffed in close proximity and the P-trap's remote location, conditions were perfect for a dry trap. Because of this "design change," I was crawling around in the dust sniffing sewer gas. I also was looking at the cost of adding trap primers to 36 apartments. It was another classic case of an apparent shortcut lowering profits.

When designing a plumbing system, I rarely give much thought to heating, ventilation, and air conditioning condensate drains. I typically don't have time to find out where and how many HVAC units are included in the project, much less figure out a piping layout or calculate sizes. Unfortunately, I'm usually forced to deal with this often-forgotten system.

I frequently wonder if condensate drains are even a plumber's responsibility. After all, the plumber did not introduce this HVAC by-product to the project. Yet just like elevators and hydraulic oil, the plumber is expected to properly and safely dispose of air handler condensation. So you tell me. On which drawings should condensate piping be shown: HVAC or plumbing sheets? Who should be responsible for a building's condensate drain piping design and layout?

This episode taught me to follow up on everything when I design a project. I mean everything! You never know when someone will think they have a better idea than you. ♦



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