

## FROM THE FIELD

## Early system start-up

BY DAN FOLEY CONTRIBUTING WRITER

This time of year, as it starts to get hot, or in the fall around the first frost, I get the call. It is from the GC on our current project.

"Hey Dan, get on out here and get the cooling (or heating) started up."

It has nothing to do with the completion status of the project and everything to do with the weather. I have received this call when windows were still missing!

The GC wants the cooling (or heating) on for the following reasons:

1. The hardwood can't go down without space conditioning.
2. The trim will move, warp or crack.
3. The drywall will gap or crack.
4. The framing will move or shift cracking the drywall.
5. The paint won't dry without conditioning.
6. The faux finishes and wallpaper cannot go on without conditioning.
7. The carpet cannot be installed without conditioning.

Any other excuse you can think of to start the mechanical system. I have heard some variation of all of these over the years.

Some of these may be legitimate. Some may be lame excuses to start the system so the GC and other subs can work in comfort. It does not matter. I am responsible for delivering a new, complete, undamaged mechanical system to the client. I promise you that you cannot do this if you run the system during construction. Residential equipment is not designed to provide construction heating or cooling, and you absolutely will damage the equipment if it is run during construction.

My responsibility is to the client, not the GC. This can lead to a sticky situation at times, especially since the GC may sign the checks in most situations. In reality, though, he is just passing on the dollars paid by the client.

It is short-sighted to start up the system before interior finishes are complete. You are the one who will be responsible for the damage caused by running the system during construction. Typically, the problems will not surface until the GC and other subs are long gone.

The client will call you on Fourth of July weekend wondering why their new \$500,000 mechanical system is not performing to their expectations. You cancel your holiday plans to respond to the call, only to find a filter clogged with sawdust or a coil clogged with a mixture of paint, fine powdery hardwood floor dust, sheetrock dust, and other construction debris, all cemented together with condensation from the coil. I can tell you from experience that once this mixture dries, it is harder than concrete and impossible to remove from between the fins of the coil stock. I once removed a coil and tried to clean it with a pressure washer. I succeeded in bending all of the fins, but the "concrete" did not budge. The only solution is to replace the coil.

Dust and debris will get into bearings and motor windings causing premature failures. Again the GC is long gone as you are in the hot seat trying to explain to a client

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why he has a large bill to replace components just out of warranty. Now that many manufacturers have extended parts warranties to five or even 10 years (to be addressed in a future column), I wonder how many parts that failed under warranty will be due to the abuse suffered while running in a construction environment.

I used to think that starting up radiant floors were OK for construction heat, as there would be no air movement. I was wrong. After suffering multiple component failures caused by running the radiant system during construction, I learned the hard way that even these systems are not immune to construction abuse.

In most cases, you are not on site every day to observe how these systems are affected by the construction process. In one case, the GC had to cut into a concrete slab with a gas powered concrete saw. The powdery concrete dust got into every crevice of two condensing boilers, as well as the bearing assembly of an expensive commercial circulator pump causing multiple component failures. On another project, the sealed combustion boilers sucked in the fine Virginia red clay dust stirred up by the site grading going on outside. This red clay dust got into the draft motor assembly causing failure.

I have come to the conclusion that it is impossible to protect the equipment if it is run during construction. Components can, and will, fail prematurely if the permanent mechanical system is used for construction site conditioning. I don't care what precautions are promised: blue filter cloth over the returns, mechanical rooms sealed shut, filters changed monthly, weekly or even daily. First off, if you are relying on the GC for the above, it won't be done. He has enough to worry about. Your mechanical system is way down on his list of concerns. Even if you take on the responsibility to protect the equipment, I assure it is impossible to deliver a new, clean system to the client if it is run during construction.

I will agree that some form of construction conditioning is a requirement in most climates. There are ways of providing it without destroying the very

## | FROM THE FIELD | CONTINUED FROM PAGE 60

mechanical system you have been contracted to provide. I will share a few of our solutions.

First, I will emphatically state that most of the reasons the GC and other subs claim are reasons for early start-up have nothing to do with the materials being installed and everything to do with the comfort of the person installing the materials. I call BS on many of the reasons stated for start-up. Millions of houses have been built with hardwood floors, plaster, trim, paint, wallpaper, etc., and no central air. How could this have been done? How can you install hardwood without central air? I can show you entire neighborhoods of houses in D.C. and close-in suburbs built from 1900-1930 with hardwood floors that, to this day, still do not have central air. Apparently, the hardwood was installed just fine without central air.

I am a team player and look to provide solutions rather than problems for my GCs. We have several solutions for providing construction conditioning on our job sites. I am not a fan of salamander or mushroom heaters that have an open flame. They are not safe left unattended on a construction site. As some of our projects have a value of tens of millions of dollars, I do not intend to burn one to the ground. Instead, we have used other solutions. On one project with three-phase power, we used multiple electric heaters. On another project, we installed a hydronic fan coil on wheels and connected it to the existing cast iron boiler that was slated to be demolished and replaced. We connected it with ¾-inch flexible rubber Onix tubing, which allowed the fan coil to be wheeled into whichever room required the most heat. At 90,000 BTU output, this was more than enough to keep the site at 50°F, even on the coldest days.

We also have a 100,000 BTU forced air furnace that we use for construction heat. We connect it with a flexible



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gas line and can run flex duct off the head if we need to distribute the heat into adjacent rooms. (See photo.) We have used this on three construction sites. When it wears out or breaks down, we will scrap it and replace it with another for about \$800, far less expensive than causing permanent damage to the installed mechanical system.

**Many times, in spite of my best efforts to explain the foolishness of an early start-up, the GC or even the owner insists on starting the mechanical system. While I believe it to be short-sighted, I will do as they wish, as long as liability is shifted to the decision makers.**

For construction cooling, we will install window units if the GC demands cooling. We also have a few portable dehumidifiers to control moisture. On our large mega-home (20,000 plus square feet) projects, we have had the GC rent portable 10 to 20 ton package AC units and flexible duct runs, similar to what you might see for large tents at weddings, events or golf tournaments. While this may appear to be expensive at first glance, it is far less than repairing or replacing mechanical systems that can run well north of \$1 million.

Many times, in spite of my best efforts to explain the foolishness of an early start-up, the GC or even the owner insists on starting the mechanical system. While I believe it to be short-sighted, I will do as they wish, as long as liability is shifted to the decision makers. I will only start the system after a waiver is signed by the GC, engineer (if there is one), architect and owner. It clearly spells out the risks of starting the system and absolves me of any and all liability of starting up the system. A copy of the waiver can be downloaded at [phcnews.com/pdf/waiver.pdf](http://phcnews.com/pdf/waiver.pdf).

In most cases, either the architect or owner will refuse to sign the waiver resolving the situation. That is the goal. I don't want to enforce the waiver. I want to avoid starting the system.

I will warn the reader that this waiver is not bulletproof. I had one project where all parties signed the waiver. The system ran during construction and the coils were clogged with construction dust and debris and ruined. The system would not perform as designed. I informed the client that the coils would need to be replaced at a certain price and he would have to pay for it. I gently reminded him of the waiver and produced a signed copy. He emphatically reminded me that I was the expert, not him, and that I started the system against my better judgment. He wondered aloud how it might play out in a court of law. He suggested I replace the coils at my expense. While not the sharpest knife in the drawer, I know better than to engage in lawsuits with multi-millionaires who sue people as a hobby. I replaced the coils. I learned my lesson, and chalked up the expense as part of my "tuition" towards my Masters and PhD in mechanical contracting. ●

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