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Southern Comfort

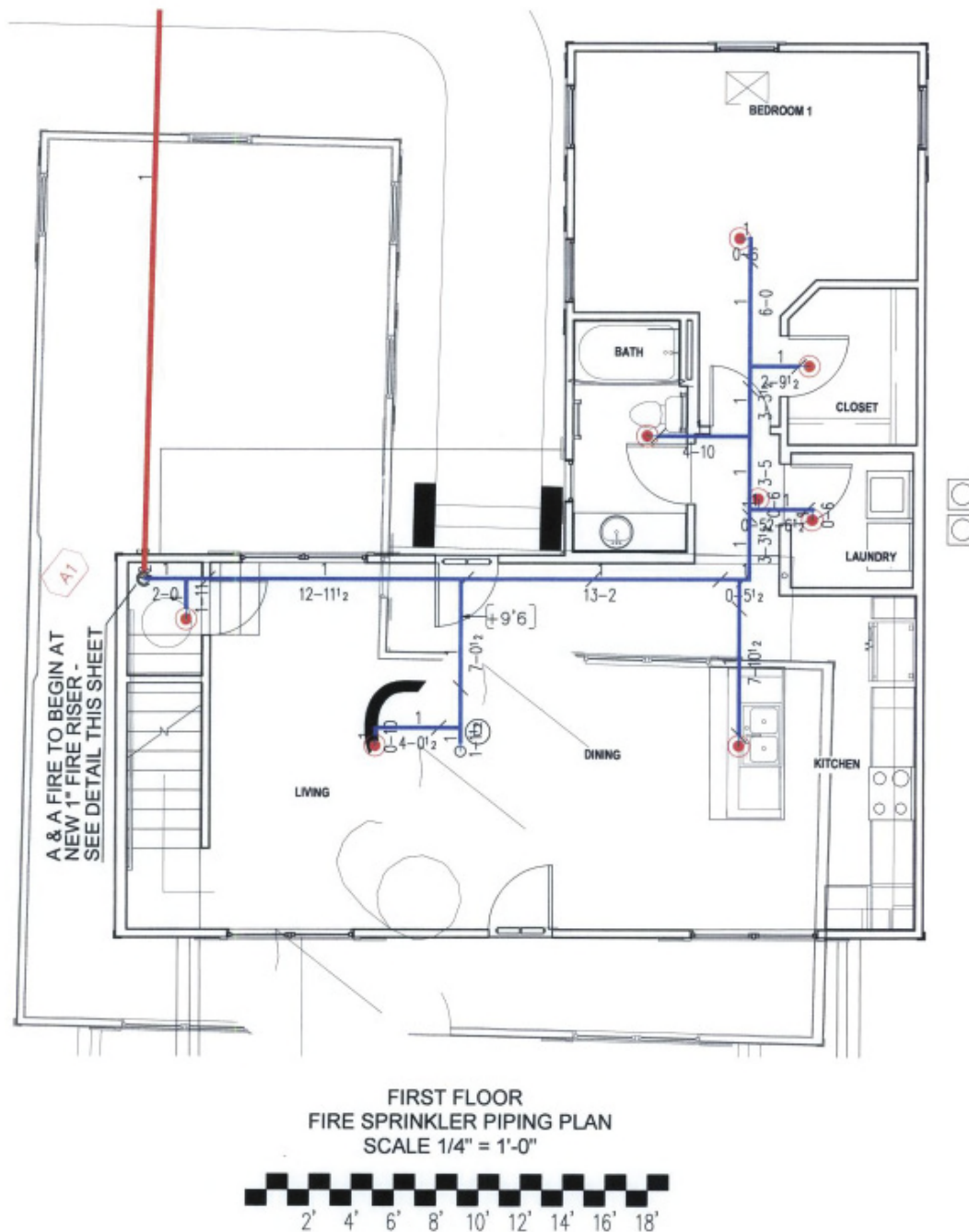
The story of how home fire sprinklers were included — then dropped, then included again — in a single-family development in South Carolina. BY RUSS DAVIS

The following is an adaptation of a talk given by Russ Davis at the 2015 Fire Sprinkler Initiative Summit, held in Boston in May. Davis is a cofounder of Homes Urban, a residential development firm in Greenville, South Carolina. [Learn more about Homestead at Hartness and the Fire Sprinkler Initiative.](#)

I'VE SPENT MY ENTIRE CAREER developing apartments for rent. I started my business in 1999, and during that time I've built a lot of student and conventional multifamily housing. Fire sprinklers have been included in probably 95 percent of the 12,000 apartment units I've built, largely because they were required by code. The only units that haven't been sprinklered were renovations of projects that were built in the '60s and '70s, before sprinklers were required.

I recently completed a \$30 million residential development of single-family homes in Greenville, South Carolina. Early in the process, when the topic of fire sprinklers came up, my first inclination was to think, "of course we'll include sprinklers"—we're landlords, and these units were going to be for rent rather than for sale, so a lot of our thinking was based on wanting to avoid lawsuits and liability.

In our site plans, we included fire sprinklers in all the units. We showed the plans to the county and to the local fire marshal and told them it was our intention to put in fire sprinklers.



A first-floor sprinkler plan for one of the homes, including the water supply (red line), interior piping (blue), and sprinkler heads (red dots). Photograph: A + A Fire Suppression Installation.

I have the gift that no matter what happens, no matter how conservative I think I am with estimating costs, when the contractor comes back to me with his estimate it's much higher than anything I had in my budget. That was the case with this development; I completely underestimated the contractor's cost. At the same time, we learned that sprinklers were not required for this kind of single-family-home development, which was a revelation to me. So we did what any developer would do—we took the fire

sprinklers out of the site plan because we couldn't afford them. We'd save hundreds of thousands of dollars on a part of the plan we didn't need anyway.

Plus, these were single-family homes with two doors to the outside, so people could get out if there was a fire. The homes would have smoke alarms. They were safe enough. That was our developer mindset.

Small homes, small plots, shared amenities, hold the sprinklers

This was an interesting project from the start. In 2012, I was approached with a unique piece of property by a local family that had owned it for a long time. It was about 400 acres and included seven ponds, pecan orchards, miles of walking trails, and great views, all within 15 minutes of downtown Greenville. It's also located within four miles of several major employers, including BMW, which employs 15,000 people here; General Electric, which has a large facility that builds gas turbines; and Michelin, whose North American headquarters is literally a mile away.

The owners, the Hartness family, loved this property, and they wanted me to develop something that accomplished two goals: they wanted to preserve as much of the land as they could, and they wanted to create income from the land for the next generation. We began to think about what we could do to make that happen.



Homestead at Hartness under construction, with a view of the "pod" design made possible by the inclusion of fire sprinklers in every home. Photograph: Homes Urban

Apartments weren't really suitable for this property—it's not the kind of land you want to put a

commodity on—so our goal moved toward developing housing for the people who don't fit well into multi-family apartment buildings. That comes down to three specific groups: mature households who are leaving their "Garage Mahal" in the suburbs because it's too big, too expensive to maintain, and the kids are gone; single-parent households, which didn't even exist in our demographics a generation ago; and the Europeans who live here for a few years while working at BMW and other local companies. A lot of Europeans bought houses here before 2008 and thought they could sell them before they went back home, and they were really disappointed in 2010—we wanted to make rentals a more viable option for them.

Instead of apartments, we began looking at dense single-family housing intended as rental property—smaller homes on small plots with shared green space and common areas. Around the country, there's a migration taking place with people moving back toward cities—not always to the urban core itself, but often to infill locations. Dense single-family developments can be great ways to meet this demand, and these days some of the best examples of this kind of housing are being built in the Pacific Northwest. We looked at examples of pocket neighborhoods with nine to 12 houses per acre, organized around a common green or parking area, and began to think that something like this could work on the Hartness property. It's not a new idea, but not much of it has been done, even in infill areas.

We ended up with a first-phase plan to develop 36 of the roughly 400 acres. The Hartness family's income requirements called for 140 units in the first phase, so we came up with a design of 15 pods, each located on one acre and containing nine single-family cottage-style rental homes—14 of the pods were identical, and the fifteenth included a few extra units. Each pod would surround a parking lot, with the fronts of the cottages all facing pedestrian greenways. The 15 pods surround shared amenities like a clubhouse, pool, gym, and dog park, a community we called Homestead at Hartness. About 75 percent of the cottages are three- or four-bedroom units, and the remainder are one- or two-bedroom homes. The cottages range from 1,100 square feet to approximately 2,100 square feet. The idea was to build these homes that my company would then manage and rent forever, to create a steady income for the Hartness family.

When we began to go through the approval process for the development, nobody—the county, the banks, pretty much anyone we dealt with—knew what to make of it, because there's no real zoning for it. Everyone understood duplexes for rent, but when you start talking about single-family homes, they want to see a specific lot, not the pods we'd designed with shared space. We finally coined the term "monoplexes" to describe the overall concept and to make it as simple as possible to understand so that the entire approval process could happen easily. It was the first time in my career with a project built under the residential code where we basically showed authorities a footprint of what we were going to build, and that was it—all they were interested in was us building to code. They didn't require any specifics of the cottages—they would just come out and inspect the units as we completed them.



Developers recognized sprinklers as a low-cost safety feature for a project rich in amenities. Photograph: Homes Urban

The problem was the scale we were building at. Once we were actually completing homes, we delivered a unit every three and a half days, a pace we maintained until the project was complete. The inspection team didn't have the resources to cover this, so we ended up paying the county for a full-time inspector to be on our job for the 18 months it took to build.

Actually, go ahead and add the sprinklers...

We were moving through the approval process without sprinklers, and the fire marshal was reviewing the site plan. He said, "When I first saw the plan, you guys told me you were going to sprinker the units. Now you're not going to sprinker them, and I have some concerns." We hadn't really understood that a lot of what we proposed, as well as the assistance we'd received from the fire department, was driven by our original intent to install sprinklers.

One problem the fire marshal had was with the length of the driveways and parking areas that served each pod. The fire marshal had a rule that this distance should be no more than 150 feet. Our distance was 180 feet, which initially the fire marshal could live with because we were sprinklering the homes. This distance affected the overall design of the entire development—the pods, the groupings, the density, everything—and we weren't anxious to undo it. The presence of sprinklers in the plan had also helped convince the fire marshal to reduce the number of fire hydrants on the site from nine to six, which represented a real savings for us. It was another example of the fire marshal providing us with an incentive to make sprinklers work. We didn't really appreciate what we were getting back for including

sprinklers in our plan.

So after talking with the fire marshal, we saw that sprinklers needed to go back into the plan. We weren't sure what kind of system we wanted to spec or how much they'd cost, but in theory we thought a multipurpose sprinkler system would be cheaper. We revisited the scope of our contractor's contract, and added a provision that he install a multipurpose fire sprinkler system—defined by NFPA 13D, Installation of Sprinkler Systems in One- and Two-Family Dwellings and Manufactured Homes, as a piping system that serves both domestic cold water and fire protection needs—in every unit.





Inspection photos of an NFPA 13D sprinkler system installed in a Homestead at Hartness home. The sprinkler systems cost about \$2,000 per unit installed, or about 1 percent of the per-unit cost of roughly \$208,000. Photographs: Jeff Nelson, fire marshal, Boiling Springs Fire Department

Not long after, the contractor called and said he couldn't get anyone to install multipurpose fire sprinklers. The plumber said he was afraid of them, that there was too much liability because the sprinkler engineer wouldn't certify the system to be installed by a plumber, who isn't considered a certified installer. So we brought in the guys we normally use to do our commercial fire sprinkler systems, and they didn't want to do a multipurpose system, either. They wanted to put in a standalone sprinkler system, where the system's water supply is separate from the home's supply of cold water, which they felt would be an upgrade over the multipurpose system—the upgraded spec of the standalone system was so simple, both the installation and the operation of it, and very robust. We were surprised by the cost, in a good way—the upgraded systems came out, on average, to less than \$2,000 per unit, or about 1 percent of the per-unit cost, which was a little over \$208,000.

But there was a snag with that, too—the water company had been fine with a multipurpose sprinkler system because it knew the water would be used, since it was tied in with the domestic cold water supply. But it had problems with a standalone system because it meant water would be sitting in the system becoming stagnant, which posed a risk of contamination to the source supply. The solution was actually

pretty easy—we installed double check valves in every home, to prevent backflow contamination of the water supply, and the water company was happy.

All total, installing sprinkler systems cost us around \$350,000. Yes, we got a great break on the price—when you buy 140 systems at a time, you're in a really attractive position—but look what we were able to add. By any measure, the cost was minimal—lumber costs alone can swing 4 percent one way or another over the course of a job. I think fire protection cost less than the granite countertops we installed. It takes about \$9.80 of rent per unit each month to pay for the sprinkler systems. What renter would say no to sprinklers and assume the risk of a fire where somebody could get hurt? That was one of our big lessons learned: No one can make the argument that the cost of sprinklers is prohibitive or somehow outweighs the benefits they provide.

There is no reason not to include sprinklers

We broke ground in August 2013, completed construction in January, and Homestead at Hartness is now fully leased. There is no analog for this project anywhere in the country where this concept has been applied to conventional households—we figured it out as we went. But there is a clear indication that we'll see more of this higher-density development around the country in the future, and this style of building certainly has implications as far as what happens in the event of a fire.

That's why the local fire department took a lot of interest in our project, and why there was no replacement for the support we received from them—that was another big takeaway of this project. The fire department was so appreciative of what we did with sprinklers, and they became a great ally in our marketing efforts. We have a lot of families renting at Hartness, and the fire department comes out and meets with kids. I'd go out there sometimes and see a fire truck on the property and I'd wonder if there was a problem—it was just the firefighters checking in, seeing how things were going.

Another takeaway is that sprinklers are easy to do in volume—it would be easy for the big national tract builders to install them in their projects. I would submit that if sprinklers become the standard for lower-priced homes, then more expensive homes will include them, too. There is no obvious downside to installing home fire sprinklers.

I think this can happen if customers demand sprinklers, but a lot of our customers need education about how they work and why they're valuable. A lot of people who've lived in apartment buildings are used to having sprinklers, but a lot of our customers have lived in homes without fire sprinklers for decades, and they may not understand them. Why do they need them? What benefits do they provide? We need to do a better job at our end with marketing those benefits.

That said, we still have some unanswered questions ourselves. For example, what kind of inspection schedule will we follow for the systems we installed? It's not clear. Is it annual? Every five years? This is a potential operating cost for us and we're still working through some of those issues. On the other hand, I think we'll ultimately realize a savings on our insurance.

Early next year, we'll begin building another 50 single-family units as part of the second phase of Homestead at Hartness, and those will also be sprinklered. We're also preparing to build 168 homes for sale, mostly single-family, on 160 lots in a blighted neighborhood in Greenville, and we'll put fire sprinklers in those units, too. We can't find a reason not to.

Top Photograph: Homes Urban