

RECOMMENDATIONS FOR 2018 RESIDENTIAL IECC CODES ADOPTION

Prepared for:

The Mayor's Committee of the Metropolitan Government
of
Nashville and Davidson County

Prepared By:

Lesley Herrmann, Indoor Air Quality Specialist, E3 INNOVATE (Primary)
Erik Daugherty, Founder/Owner, LEED for Homes AP, E3 INNOVATE
Stefan Peter-Contesse, Certified HERS Rater, E3 INNOVATE
Nathan Terry, Lead Certified HERS Rater, E3 INNOVATE
Trent Williams, Certified HERS Rater, E3 INNOVATE
Anthony Vigiletti, Chairman of the Mayors Commission
on Beautification and the Environment (Contributor)

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Introduction

The International Energy Conservation Code (IECC) is a well-researched set of standards developed in collaboration with researchers, industry experts, builders, and other key players. Each code update attempts to increase efficiency but also addresses challenges from previous code versions. Although the energy code is designed to reduce building energy consumption, it also helps to create safe, resilient, and habitable structures based on building science and physics principles if adopted and enforced accurately and strategically.

Since the start of 2020, we have experienced change and adaptation in ways like never before. Just nine months ago, no one could have imagined that our homes would become our office, our school, our restaurant, our entertainment center, and our safe haven. Spending more time in our home is now the new norm. Unfortunately, the EPA suggests that the air we breathe indoors can be up to five times more polluted than outdoor air in large cities like Nashville. Although important, air quality is drastically underappreciated.

Adopting a version of the code and then amending out requirements – as Davidson County has done in its current version of the residential building code – creates a situation where design strategies that were intended to work together as a system end up causing problems. Such is the case with building a tight home without a proper ventilation strategy. Solving the resulting indoor air quality issues is challenging, invasive, and expensive. It is much more cost effective for everyone involved to design and build homes with proper ventilation strategies from the very beginning.

E3 INNOVATE recommends Davidson County adopt the 2018 IRC and IECC *without amendments* in an effort to reduce the health and safety risks associated with a sick house. There are other benefits as well, which will be highlighted in this article. They include:

- Greater flexibility for builders to meet code
- Reduced liability risk to builders
- Equity preservation
- Competitive advantage
- Safer places for our families to shelter-in-place
- Reduced greenhouse gas emissions

We also discuss some of our own client's experiences with building and purchasing new homes in Davidson County.

Health and Safety Risks Associated with Business-as-Usual and the Benefits of Upgrading Construction

The primary concern with the existing amended code revolves around high air leakage rate allowances and the lack of enforcement of ventilation requirements. Other problematic amendments will be discussed as well. Below are the major issues with health and safety that we face with the current code and the benefits of adopting the 2018 code as written.

Air Leakage

Under current code requirements, air leakage rates were amended from 3.0 air changes per hour (ACH) (2012/18 IECC) to 7.0 ACH (2009 ACH). However, many homes are being built with leakage rates well below the 5.0 ACH threshold for mechanical ventilation, yet ventilation requirements are not being consistently enforced. Many homes being built today are tighter than in the past because of the use of off-the-shelf products and the wide-spread application of spray foam insulation. As a result, the lack of fresh air creates potentially dangerous indoor air quality risks, including exposure to:

- **High radon levels:** Radon is the second leading cause of lung cancer in the U.S. and results in about 20,000 deaths each year (1). Additionally, Davidson County resides in a Class 1 radon zone, meaning there is a high risk for radon levels to exceed the EPA's recommended threshold (7).
- **Mycotoxins from mold:** Exposure to mycotoxins (a type of biotoxin) can lead to Chronic Inflammatory Response Syndrome (CIRS) in genetically susceptible individuals, roughly 25% of the overall population (2).
- **Carbon monoxide:** Carbon monoxide is a toxic byproduct of combustion from gas appliances. Although less than 500 people die each year in the U.S. as a result of carbon monoxide poisoning, more than 20,000 people are hospitalized (3).
- **Allergens, including dust, dust mites, cockroaches, and mold:** These contaminants can cause an increase in asthma symptoms as well as general allergy symptoms (4).
- **Volatile organic compounds (VOCs):** These toxic chemicals can be found in thousands of products – many of which are used in the home – including items such as new flooring, paint, furnishings, mattresses, other home goods, and cleaning and finishing products. Excessive exposure can lead to nausea, headaches, cough, cognitive impairment, and many other symptoms (5).

Following the 2018 code, as written, would require homes to be built to 3.0 ACH and with a mechanical fresh-air ventilation system. This adoption would help reduce the risk of sick building syndrome by reducing moisture intrusion by exhausting and diluting VOCs and other indoor air pollutants.

Accompanying benefits of reducing air leakage rates include lower energy consumption, lower greenhouse gas emissions, and improved comfort in all seasons.

Duct Leakage

Under current code requirements, duct leakage rates (leakage to the outside) have been increased from 4 cfm/100 ft² (2012/18 IECC) to 12 cfm/100 ft² (2009 IECC). Leaky ductwork allows air from the crawlspace and/or attic to be pulled into the system by pressure differences and circulated through the home. This air often contains humidity, dust from insulation, mold, allergens, soil odors, and radon. Reducing duct leakage rates will help improve indoor air quality by minimizing these contaminants.

Secondary benefits of reducing duct leakage include reduced energy use, lower greenhouse gas emissions, less risk of ambiguous odors, and improved comfort.

Insulation and Fenestration Properties

The table below lists the insulation level and window requirements for the 2012/18 IECC and the 2009 IECC as well as those that have been adopted by Davidson County under the amended code. The adopted values are more in line with the 2009 IECC than the 2012/18 IECC for the roof, ceiling, framed walls, and solar heat gain coefficient (SHGC).

Table 1*: Insulation & Fenestration Values of 2012/18, 2009, and Adopted Codes

	2012/18	2009	Davidson Co.
Flat Roof	R-49	R-38	R-38
Ceiling	R-49	R-38	R-38
Wood Frame Walls	R-20	R-13	R-13
Basement Walls	R-10/13 _{cavity}	R-10/13	R-10/13
Floor	R-19	R-19	R-19
Crawlspace Wall	R-10/13 _{interior}	R-10/13	R-10/13
Slab	R-10	R-10	R-10
Fenestration U-Value	0.35/0.32 ₂₀₁₈	0.35	0.35
Fenestration SHGC	0.4	No Requirement	No Requirement

* Refer to Table R402.1.2 for Insulation and Fenestration Criteria of the International Building Code

The thermal properties of the building envelope are important in every season but are most critical during extreme instances of hot and cold weather. Insulation and efficient windows help maintain livable indoor temperatures for longer periods of time during extreme conditions, helping residence “shelter-in-place” more easily during times of emergencies. This topic will be discussed in more detail later.

Additional Benefits

More Flexibility for Builders

Adopting the 2018 code, un-amended, allows builders a secondary pathway for compliance. Allowing an Energy Rating Index (ERI), or performance pathway, gives builders the flexibility in how they meet requirements. With this option, builders can decide what energy efficient measures to implement to achieve the required ERI without having to meet each prescriptive requirement.

For example, a builder could continue building with 2x4 wall construction but install a more efficient HVAC system, increase ceiling or roof insulation, and install more efficient windows to lower the overall ERI below the required threshold.

Reduced Builder Liability Risk

Building a home designed to the 2018 code standard, with a tight envelope, proper fresh-air ventilation, tight ductwork, and a proper sized HVAC system has the following risk-abatement benefits:

- Reduces the potential risk of homeowner exposure to VOCs, formaldehyde, and other indoor air contaminants that can affect the health and safety of the occupants and cause sick building syndrome. Many building materials emit these air pollutants.
- Reduces the risk of air condensation caused by infiltration and leaky ductwork. Condensation often leads to localized mold growth, another contributor to sick building syndrome.
- Reduces the risk of elevated humidity, odors, and high radon levels arising from leaky ductwork located in a vented crawlspace.
- Reduces premature building degradation.

By building homes to the 2018 un-amended code, builders can avoid call-backs from unhappy homeowners and the potential for costly fixes and repairs.

Equity Preservation

The benefits of purchasing a home are plentiful, but probably the most popular benefit is the opportunity for equity, or ownership of an asset. A home purchase is the biggest investment most people will ever make. And, we purchase homes with the desire that the value of our asset will increase over time. This requires that homes be built with quality and sound construction.

When homes make people sick because of mold growth or poor indoor air induced by a lack of ventilation or subpar construction, homeowners are forced to move or invest tens of thousands of dollars to fix problems that fundamentally never should

have happened. If they don't have the cash to make these investments, the value of the house could degrade as maintenance and repairs go unaddressed. This also creates an issue for banks, as the value of their asset can decrease.

Improving building codes can help keep families in their homes, help homeowners build and retain their equity, and therefore stabilize neighborhoods.

Safer Shelter-in-Place and Better Resiliency

The current COVID-19 event has forced people to spend more time in their homes as a result of the "safer-at-home" order, but are we actually safer in our homes, or do we now face other threats? It is important during times of emergency that people have a safe, healthy home for sheltering-in-place. As Trish Riggs from the Urban Land Institute states,

"Place matters in terms of how a building's design either increases or decreases vulnerability to illness and how well living spaces service as places for quarantining and teleworking (6)."

As a result of many states stay-at-home policies, Riggs predicts that Realtors may soon jump on board with efforts towards "making the invisible factors more visible through building performance testing", such as that provided by codes testing, ERI's and other means. Building to the 2018 un-amended code will help create healthier homes that more people may seek in the wake of current events.

Resiliency is a defined term in the housing industry as, "the ability to prepare and plan for, absorb, recover from, and more successfully adapt to adverse events (8)." While COVID has pushed people inside, catastrophic climate events including hurricanes, tornadoes, extreme cold, and extreme heat, are also going to require resilient structures to withstand and allow for extended periods in the home, and sometimes without power. The table below summarizes how widespread energy efficiency measures benefit resiliency (9). The benefits of efficient housing and buildings in general are highlighted in bold.

Table 2: Resilience Benefits of Energy Efficiency (Ribiero et al, 2015)

Benefit Type	Energy Efficiency Outcome	Resilience Benefit
Emergency response and recovery	Reduced electric demand	Increased reliability during times of stress on the electric system and increased ability to respond to system emergencies
	Backup power supply from combined heat and power (CHP) and micro-grids	Ability to maintain energy supply during emergency or disruption
	Efficient buildings that maintain temperatures	Residents can shelter in place as long as buildings structural integrity is maintained
	Multiple modes of transportation and efficient vehicles	Several travel options that can be used during evacuations and disruptions
Social and economic	Local economic resources may stay in the community	Stronger local economy that is less susceptible to hazards and disruptions
	Reduced exposure to energy price volatility	Economy is better positioned to manage energy price increases and households and businesses are better able to plan for future
	Reduced spending on energy	Ability to spend income on other needs, increasing disposable income (especially important for low-income families)
	Improved indoor air quality and emission of fewer local pollutants	Fewer public health stressors
Climate mitigation and adaptation	Reduced greenhouse gas emissions from power plants	Mitigation of climate change (and improved public health)
	Cost-effective efficiency investments	More leeway to maximize investment in resilient redundancy measures, including adaptation measures

Market Impact and Competitive Advantage

Adopting the 2018 code can have significant benefits on improving the quality of homes being built in Davidson County, as discussed throughout this article. Improving quality provides a competitive advantage for individual’s relocating to Tennessee from other areas of the country where building standards currently far surpass Tennessee. We want to be able to say that we have homes available in our state that compete with the best homes on the US market, and adopting the 2018 code is great step in that direction. This would provide an economic advantage to the city and the state.

Homeowners' Voice

E3 INNOVATE helps dozens of clients every year solve complicated home performance problems. Many of these problems arise in newly constructed homes. Often times, homeowners have worked with numerous other contractors before contacting E3 INNOVATE who have not been able to solve their complex problem(s). E3 INNOVATE applies building science and diagnostic testing to identify the root cause of the home performance issue(s). Unfortunately, the repairs needed to solve the problem(s) are not cheap or easy. They often require tens of thousands of dollars worth of parts and labor.

E3 INNOVATE also works with homeowners building new custom homes. We offer homeowners guidance on strategy, materials, and mechanical systems while also providing energy modeling and HVAC sizing calculations. We offer pre- and post-construction testing to ensure the home will perform as designed after it is constructed. These services fill the knowledge gaps that often occur due to inexperienced and untrained builders and subcontractors.

Appendix A and B share the voice of two homeowners E3 INNOVATE has recently worked with. Their voices represent their own projects as well as many other people we have helped over the years with similar experiences. These individuals share their observations and frustration with the quality of construction and the current effectiveness of building codes in Davidson County.

The first homeowner ("Client A" referenced in Appendix A) recently built a new construction home and shares the challenges and frustrations he encountered during the project. The second homeowner ("Client B" referenced in Appendix B) describes his family's experience with sick building syndrome in a home built in 2016 and the repair work that was necessary to create a habitable indoor environment.

Builders' Voice

It is fair to say that builders want to maintain their reputation. They want to sell a good product, while also optimizing profits. As a result, their arguments can sometimes be conflicting. Although their argument for better building codes as a way to improve quality is inconsistent, the concern over rising cost is persistent. This section highlights both of these arguments.

Support for Codes

The following quote was taken directly from an email from members of the National Association of Home Builders (NAHB) of Middle Tennessee on February 28, 2020 telling constituents to call in to *oppose* Senate Bill 2137, the Energy Savings and Industrial Competitiveness Act of 2019. At the bottom of the email, however, they included this block of text, which seems to contradict their opposition for stricter building codes:

“The model building and energy code is developed through an established, proven, and effective process managed by the International Code Council (ICC) that dates back decades. Hundreds of stakeholders, including government agencies, participate in the development of model codes each revision cycle. It is the most credible and trusted forum for convening stakeholders and building consensus ever assembled in the building code arena.”

We are simply highlighting the fact that the HBA-MT often contradicts themselves. They too see value in the codes, but likely don't want the burden of changing their building strategies, adding cost, or slowing down the construction process.

One recommendation is to offer training to builders and contractors on the benefits of code changes and how to best implement the new requirements. There is a significant knowledge gap between existing building practices taking place in Middle Tennessee and the *building science* that is embedded in the building codes.

Concern Over Increased Costs

Builders have voiced concerns about an increase in building cost. They have claimed that the added cost of implementing stricter energy codes would be around \$2,500 per house and would result in a 25-year payback.

E3 INNOVATE did a simple energy modeling analysis to estimate the energy cost savings between the 2009 and 2018 IECC for a 2,000 sqft single-family home. From our simple energy modeling example, we found that homeowners can expect to see energy cost savings of roughly \$280 per year. Using the HBA's \$2,500 incremental cost figure, this equates to a nine-year simple payback period (SPP). This calculation does not include factoring future increases in energy costs or inflation, which would further *lower* the SPP.

Table 3: Annual Energy Cost Savings Associated with Updates (2009 → 2018)

Code update	Change in Value	Annual Savings (\$)
Wall Insulation	R13 → R20	\$92
Ceiling Insulation	R38 → R49	\$9
Duct Leakage (outside)	8% → 4%	\$65
Air Leakage	7 ACH → 3 ACH	\$84
Slab Edge Insulation	R0 → R5	\$29
		Total: \$279/year

Modeling parameters: 2 story, 2,000 sq.ft. single-family detached home with 3 bedrooms. Both models have ventilation set to ASHRAE 62.2 2013 minimum with infiltration credit.

It would be more helpful to see a detailed breakdown of the assumed added cost from each building component than to base cost burdens on assumptions.

Summary

In closing, we ask the Mayor of Nashville and the codes committee to consider the history of building codes, where they have gotten us, and the potential for where they can take us in the future.

Everyone agrees, building codes help to create a safer, more sustainable home. They are intentionally crafted by professionals and should be modified with great care, understanding the impacts and ramifications of amendments. It is important that we not only implement codes properly, but that we understand *why* codes are written the way they are and the benefits they can bring. There is a significant knowledge gap between existing building practices taking place in Middle Tennessee today and the *building science* that is embedded in the building codes.

Secondary benefits of and the rationale behind updating the IECC to the 2018 version and creating healthier, more efficient homes include:

- Fewer employee sick days and greater productivity. Numerous studies have shown a link between indoor air quality and employee attendance and productivity. Although many of the studies are based on commercial building settings, it is important we now consider indoor air quality in our homes as the frequency of working and learning from home will be significantly greater than in years past as we face a new post-pandemic reality (10).
- Reduces the health risks for homeowners and occupants, thus potentially reducing health care costs for the State of Tennessee.
- Less money spent by builders and homeowners on fixing problems related to air leakage, duct leakage, poor moisture control, indoor air quality issues from inadequate ventilation, and many other unforeseen issues that the code has been developed to prevent.
- Reduces builder liability.
- Greenhouse gas emission reductions, which will help the City of Nashville meet current and future CO2 reduction targets.
- Prevents conditions in which a home becomes uninhabitable from mold, mildew, and/or VOCs.
- Helps improve the health and safety of the state's housing stock.
- Upholds home equity for homeowners and lenders.

Each version of the code builds on itself, improving the later version with new and updated techniques, products, and materials. The energy code is designed to reduce building energy consumption, but at the same time, it helps to create safe, resilient, and habitable structures.

Therefore, it is in the city's best interest to adopt the code as written to achieve the maximum benefit of the code. A report from the Environmental and Energy Study Institute (EESI) from 2013 summarizes it well (11):

“A building is only built once, and the consequences of new construction decisions last for its lifetime. [Those decisions] affect not only energy, environment, resilience and safety, but also... cost effectiveness, functionality, accessibility, productivity and overall sustainability.”

It is our hope that building codes will continue to push forward and help address today's carbon emission problems, provide families safe and comfortable homes from which to work, learn, live and shelter from, and provide an opportunity to preserve the assets of the City's home building stock.

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Appendix

Client A: Custom Home

[During the construction process, I witnessed] substantial knowledge gaps, as my builders and subcontractors were not trained on the best methods to insulate the house. The framing had to be done differently than they were accustomed and they adjusted. The more complex items, like sealing rim joints, were a brand new concept to them.

The HVAC contractor was using an outdated model [of my home when sizing the HVAC system], which didn't take into account the energy efficiency of the windows and doors. Consequently, they sized the unit much larger than I needed. Additionally, they used the absolute worst case [design conditions], which I would NEVER have, to size the unit. Having a split unit was a much better choice and the sizing has proven to be extremely comfortable even on 90-degree days.

We had to go back several times to redo items that should have already been completed. This increased my costs probably 15-20% more than I expected.

I love our new house and I couldn't be happier that we took the extra steps that we did. However, this should be the standard, not the exception, for new builds moving forward.

All of the practices that we incorporated into this house should be more standard practice across all builders. Tennessee lags behind the best nationwide practices, and this is inexcusable in my opinion. Nashville, especially, should be a leader, not a very late follower.

If I were the leader of the Codes department, I would set a date for all builders to be compliant to the latest codes and move forward. We [the city of Nashville] should be a beacon of intelligence and environmental sustainability.

Client B: Existing Home

Nashville Codes,

I write to you with grave concerns over the state of building in our beloved city. Like many, I wrestle with the blessings and curses of our recent growth. The increase in property values, convenience, and quality of life are remarkable in the 15 years we've lived in Middle TN. On the other hand, I am more concerned that ever that the Nashville gold rush is going to lead to an explosion of entirely preventable building and health problems in the decades to come. Having talked to numerous owners of newly built homes, I know that the issues I detail below are not unique to our situation. To keep this from being a novel, I won't even begin to address the hatred our community has for allowing three or four zero lot-line homes to fill a plot where previously there was one.

When we decided to buy our dream home 5 years ago, we searched for the perfect place to raise our young children and felt unfathomably lucky when one came available that fit our needs on a beautiful street with lots of kids and no through-traffic. The home was a newly built spec home from a builder with a well-curated reputation and a focus on aesthetics and finishes. If they said "custom built with care and love" once during our purchase, they said it a thousand times. As we now know, our outwardly beautiful house was rotten under the hood. The proverbial lipstick on a pig. I am convinced that what you'll read below is the status quo in our town: nice looking homes, thrown up as cheaply and as quickly as possible to capitalize on huge demand, rapid growth, and cheap mortgage rates with little consideration of the long-term health of the occupants.

When we moved, it was early Fall when Nashville's weather starts to cool off and dry out. In our first 9 months, we addressed with our builder a number of small issues symptomatic of carelessness and lack of craftsmanship. Poorly installed plumbing, holes drilled in pipes, lack of access to an attic space, lack of proper ventilation for our gas fireplace, HVAC returns and ducts filled with dust and trash, quickly eroding caulking, mold spots on beams in the crawl, big temperature differentials between rooms, standing water in the backyard, lack of closet infrastructure, the list goes on. Each time, the builder agreed to address them under our one-year warranty (which we have discovered was never written down anywhere or provided during closing). Many of these original issues reared their heads shortly after we moved in and could not have been caught by the cursory inspection most normal people pay for. As frustrating as those discoveries were, they paled in comparison to what happened when our weather turned hot and humid the following Spring.

The first thing we noticed was the humidity. On a typical Spring/Summer day we could feel our feet sticking to the hardwood and our clothes sticking to us. An inspection by a VERY sharp HVAC contractor discovered midday humidity levels indoors in the 65%+ range. He assured me that those levels were inappropriate for a new build with spray foam insulation throughout. To try to dry the home out, we installed dehumidifiers for the crawl...and then the first floor...and then the second floor. At its worst, he estimates that we were pumping a small swimming pool's worth of water out of the home.

The second thing we noticed was the smell. I cannot adequately describe to you the fear induced by the chemically, unnatural smell that our second floor was filled with on hot days. My gut told me the two were related but building is not my profession so we began relying on costly experts to try to get to the root of the problem. We have spent at least 30 nights in a hotel since we moved in to escape the smell. The money pit that has ensued over past 5 years would have bankrupt most families. Hundreds of thousands of dollars later, I believe the house livable and safe through an incredible amount of trial and error. The amount of time, energy, and money wasted here is stunning. I practically have an unwanted PhD in building science at this point because there are so few local experts to help in a situation like this and even with their help, the homeowner has a constant stream of difficult decisions to make. A list of the unfortunate discoveries and subsequent remedies:

1. Faulty spray foam installation in the attic, exterior walls, and crawl. A visual inspection in the attic and crawl showed areas that were too thin, areas that were too deep, and numerous spots that were brown and uncured. I find it unimaginable that inspections by codes and our inspector didn't catch this before the walls went up. White spray foam is not supposed to be brown and/or sticky. We also tested some exterior walls by taking down drywall and found similar issues. Given the pervasiveness of the problem, we felt obligated to scrape out as much of the existing spray foam as possible. This included removing our belongings, taking down the drywall, scraping out the foam, re-applying new insulation, then putting the walls back up and moving back in. For a family, it was a complete disaster. Two different experts looked at the problem and cannot fathom what on Earth the installer was doing. They were apparently brand new, drunk, or both.

2. Poorly wrapped crawlspace with a brutally warped and ineffective door. The entire crawl had to be re-wrapped and a sump pump installed given the wetness of this part of town. It certainly didn't help the moisture in the crawl that the yard wasn't graded properly and at least two of the downspouts (that we know of) connect to nothing and dump water at the base of the foundation. Conveniently, the ends of those downspouts were also below ground to hide the problem.

3. Four courses of brick below ground. I have come to learn that brick is supposed to stop a foot above ground to avoid making the masonry a sponge during the wet season. Cracks in that masonry below ground are also a wonderful entry point for pests, which would help to explain the massive cockroach problem we discovered upon opening up our second floor walls. A builder neighbor that watched the build suspects that they set the house below grade to get beneath the city's height restrictions. Five years later, the mortar is also cracking and corroding all around our exterior. Two masons suspect the crew added sand to the mix to save money, make it last longer, and dry more quickly. Unfortunately, that also makes the lifespan in a hot climate a few years instead of a few decades. We are in the process of plugging hundreds of holes in our brick.

4. Lack of flashing where roofing meets brick. After discovering water damage and an infestation of carpenter ants, we found the likely source to be poor roofing techniques. Left unattended, this would most certainly have been a huge mold problem over time.

5. A massively oversized HVAC system. The cheap package unit used was, by the estimation of three different contractors, 2-3 times too large for a home of our size. I am told this problem is

rampant and that Nashville's code here is woefully behind the current science and similar climate cities like Austin et al. The system kicks on, it cools the home too quickly, and gives neither the coils nor the home a chance to dry out. Mix this with a wet crawl and the time bomb clock starts ticking. Too little air flow also leaves the air under-filtered and creates ongoing issues with dust and small particles which environmental doctors consider a massive source of chronic health conditions. This mattered less when houses were leaky but becomes a disaster in a tightly sealed home as dust, particles, and airborne toxins build up with nowhere to go. Some extensive testing we had done showed terrifying levels of formaldehyde and other volatile organic compounds in our indoor air. Faulty spray foam, hot weather, and a tight envelope don't mix. It has also become apparent to me that energy recovery ventilators (ERVs) are now the current standard for tightly sealed homes and yet not required in Middle TN. Where is the fresh air supposed to come from short of opening your windows once an hour? ERVs, it would seem, would be a relatively inexpensive fix for many of these problems as they both reduce humidity and introduce fresh, filtered air at the same time. For the sake of our residents, I beg you to consider requiring them in tightly built homes. This LEED certification movement has made our homes much better for the environment and infinitely worse for the people that live in them.

As our situation worsened, I started to suspect that we were either horrifically unlucky or that the problem is systemic. Unfortunately, I now believe these situations are all too common and that some basic investigative reporting would uncover rampant owner dissatisfaction and abuse of our current system. I believe there are great builders and terrible builders in Nashville. I believe there are people who take great pride in the homes they build and then there are those just trying to make a buck while the boom is raging. Our residents need you to protect them because we know virtually nothing about masonry, moisture management, building envelope design, filtering and fresh air intake, and insulation installation. Some basic improvements that would make a world of difference:

1. End the practice of self-inspection. I cannot verify that this is really happening but builders tell me it's common and, if so, it has to stop. The fox cannot decide whether the hen house is secure. I realize that inspections and codes are struggling to keep pace with the rate of building but something has to give here. If we need more bodies to handle the volume, we need to hire and train them. If that means builders have to pay an additional fee to finance the inspections, so be it. That goes against my libertarian nature but if they are going to make fortunes off our community, they should be required to help keep that community safe. Several general contractors have also mentioned that inspections are needed at more points in the construction process.
2. Please take a hard look at the current science of HVAC sizing. Every day we wait to update our standards, another spec home is built with equipment multiple times too large.
3. Require ERVs on all new builds with spray foam. Tight home – fresh air + moisture/mold/chemicals = DISASTER.
4. Enforce the practice of ending masonry at least a foot above ground. I have learned that many builders go below grade for aesthetic purposes but the look of a home matters less than the health of the people living in it.

5. Add more guidance and a special inspection following spray foam installation. Properly installed it's a marvel of modern technology. Poorly installed it can ruin a family's life and is outrageously difficult and costly to fix.

I have no interest in destroying the business or reputation of my builder. I think he's actually a good man who doesn't understand the implications of what he's doing and relied too heavily on a careless foreman. This is not about our home; this is about our beloved city and the health of its citizens for decades to come. We should never have had to spend an obscene amount of money to fix a five-year-old house. We should not have had to go to local hotels to get some sleep. We never should have had to worry about the safety of our children. I should not have had to take countless days off work to meet masons, roofers, painters, indoor air quality experts, insulation contractors, or HVAC companies. All of this was completely avoidable. We just need to be more current and more vigilant. Please help.

Yours,

Nashville