Gord Cooke 15-20 minutes at NAHB IBS in Las Vegas, NV

Kat Godlewski: Welcome to the US Environmental Protection Agency's Indoor airPLUS podcast series. This episode is being recorded prior to the National Association of Home Builders, International Builders' Show in Las Vegas, Nevada. The Indoor airPLUS team has the privilege of sitting down to have a conversation with Gord Cooke. Today's episode will cover some of what is being discussed here at IBS and some strategies, techniques and building practices in regards to Indoor airPLUS.

Nick Hurst: Hi, we are here at the National Association of Home Builders, International Builders' Show, just prior to the start of the show here in Nevada. My name is Nick Hurst with ICF International and we'll be exhibiting at IBS on behalf of the EPA's Indoor airPLUS program. Today we are lucky to have Gord Cooke of Construction Instruction with us; he will also be speaking and demonstrating a number of topics during the show and we are privileged to have him here with us discussing Indoor airPLUS. Gord, could you give us a brief overview of what's about to transpire here at the show in general and what you'll be doing?

Gord Cooke: Yeah, thanks for having me Nick, it is fun to be here. We've actually been asked by NAHB, by what they call their High Performance Building Zone, to do a demonstration of some of the key aspects of building science, so building science applied, if you will. We've taken some of the technologies and elements that make for high performance and just kind of showing them on stage. I'll be working with two great guys, they'll be building and I'll be narrating what they're up to.

Nick Hurst: Fantastic. Can you tell us a little about high performance homes and the nexus of energy efficiency and indoor air quality and how those two key elements of high performance homes are going to fit into your presentations?

Gord Cooke: Sure. It is kind of an interesting term, high performance. We start out years ago with energy efficiency, then it was a trend towards healthy homes and now we seemed to have coined this term that seems to resonate with people, high performance. It's really what we like to say is the culmination of building sciences, what you would call a systems approach. In the old days we called it houses system. Everything impacts everything else. In the past we might have been focused on energy or air quality. Now we realized that, if you do it from a good scientific basis, the systems approach, that in fact everything you do for energy efficiency also includes things like durability and indoor air quality. That's going to be a really cool thing. You see it in your own world with ENERGY STAR and the Indoor airPLUS program that the checklist you used to use for ENERGY STAR really had some nice carry over to the checklist that is now used for the Indoor airPLUS program. The synergies are what we are going to focus on, that there are things that can be done, but as you do one, you are addressing multiple aspects of the house.

Nick Hurst: That's great, excellent. You do a lot of work around the country, all around North America, with builders. You do a lot of education and speaking. What are some of the new techniques or technologies that you see emerging in building science?

Gord Cooke: It is a lot of fun, as you said. I get to travel and I work directly with 50 or 60 builders in my own world on a day to day basis and I do get to travel across North America. There are these common themes that are happening. Some would say its emerging codes. We are seeing codification for example of air tightness. Something that we've been thinking about for a long time. I've been personally blower

door testing houses for about 25 years and now we are seeing that is part of code requirement 2013 International Energy Code. We are seeing codification of things like exterior insulation, insulation in general, more insulation in walls. That's a good thing obviously, it stops the flow of heat, but it also, back to that building science issue, you have to be a little careful and understand how to apply that. As we add more insulation to walls, we stop the flow of heat, that's great from an energy perspective, but we when we stop the flow of heat, heat is really good at keeping things dry. We've reduced the drying potential of walls. These are the types of things we like to help builders with and apply. As builders move along this scale of energy and air tightness and more thermal insulation, we really need to remind them of the fundamentals of building science in respect to air, heat, and moisture flow. Great new technologies are coming with respect to mechanical systems, but always keeping in mind the management of water is what we try to remind folks of as we travel the country.

Nick Hurst: Absolutely, well, I just want to put you on the spot quickly. In that regard, when it comes to indoor air quality in general, if you had to rank your top three items of concern that you would see in the realm of indoor air quality, what would they be?

Gord Cooke: I think it's pretty easy, and you said three. So the first one would be moisture control, and the second very important one is moisture control and the third most important thing is moisture control. We say that kind of tongue in cheek, but in fact if we split the building and said moisture control in foundation, because we are connecting materials to wet soils everywhere, we build out of materials that are hydroscopic, concrete and wood. So we try to help builders, regardless of foundation they are doing, whether there is a crawl space, basement, or slab on grade, worrying about moisture control and foundation envelope. Then we need to think about moisture control and building envelope above grade. As I just said, you're adding more insulation, which reduces heat flow, which reduces drying potential. We have to do a better job of moisture control with rain screens and water management on the outside of the building. And lastly, we need to think about moisture management inside of houses. That is we are building tighter houses, people are spending more time indoors, they are doing more showering, more cooking, more cleaning than ever before and we really have to think about occupant moisture control. Three elements of moisture control, obviously, as I said, a little tongue in cheek, three emerging technologies, or three things that are on the go, moisture. But in addition to that, we are starting to see things like a real understanding and emphasis on ventilation, HVAC. We always like to remind heating contractors and air conditioning contractors that the term is HVAC, heating, ventilation and air conditioning. We always have to remind them to put the 'V' back into HVAC. Not to forget that ventilation is a very important component. So, those would be the top three, moisture, ventilation and proper HVAC design.

Nick Hurst: Great. Indoor airPLUS obviously does address moisture in a lot of different respects. We were over at the convention center a little earlier today and they were obviously getting set up for a number of neat demonstrations, etc. When it comes to indoor air quality, specifically in crawl spaces, and in basements, you had mentioned this as one of those key aspects, and I noticed on the agenda you will be speaking a little bit about crawl spaces in the next couple of days. What would you say are the key reasons Indoor airPLUS has incorporated the requirement for a closed and conditioned crawl space for Indoor airPLUS homes?

Gord Cooke: It's a very important question Nick, and as a northern climate guy, who has historically done basements, we've always recognized that living in holes in the ground is not an easy thing to do.

Why do we do it? Why do we dig the hole in the first place? Historically it's to get to undisturbed soils that are below the frost line. We dig holes in northern climates and as we move south we don't need to dig as deep a hole, but we are still getting below grade. Anytime we are below grade, water collects. And I'm often reminded, I hope you don't mind this story, I used to do a lot of training with a fellow who is both a builder and a farmer. He used to say to me, farming, you did a hole, you line it with concrete and you hope water stays in it, it's called a slew and it's for watering cattle. In housing, we dig a hole, line it with concrete and hope water stays out of it and we call it a basement and now we want people to live in it. We never used to live in basements, but now we do. So we've learned in the north, the best thing to do is to manage basements as part of the living space. The only way to really manage moisture is to keep that space heated and conditioned and the same has to be true with crawl spaces. That is, any time you are below grade, a little different if you are above grade in a flood plain and so on, but if you are below grade at all, crawlspaces should really be treated as a short basement. Learn from the guys north of you and understand that you really want to keep this as part of the conditioned space. The reason for this is because things have changed. When you put insulation in the floor joist cavity, you have effectively said the crawl space is no longer warm. It used to be warmer and now it is colder. And cold spaces don't have any drying potential. So crawl spaces may have worked years ago, but the minute you insulate that floor, the expectations of customers for warm floors and energy efficiency, crawlspace is now cold and cold equals damp. Damp equals mold and degradation of the building materials. So for this reason, because things have changed and we have added insulation and are going to add insulation between the crawl space and the house, we really need to think about conditioning the crawl space. Conditioning the crawl space isn't that difficult. Take the insulation that you put in the floor, put it in the side walls, maybe insulate part of the slab, although that's not that important, but now make it part of the conditioned volume of the home. Not that difficult to do, just a little change in process, and what you'll find is that space works much better. It's a much better opportunity to control moisture in that space, and moisture, we just said, is the key determinant, the single most important thing a builder can do to ensure good air quality for families living there.

Nick Hurst: Yeah, absolutely. It makes a lot of sense. You know, getting back to some of the work you do with builders, all across the country, all over North America, you have a very bright team of staff at Construction Instruction and I'm sure that you're recognizing some of those challenges that builders run into. What are some of the innovative new ideas that you and your team have worked on recently in bringing new opportunities to builders?

Gord Cooke: And I love that word, challenges. I think that is important. What I find really encouraging in the building industry these days, part because of building science, but more just because, I think it's just an advantage of the building industry, builders are more proactive then they were before. They are looking for the next thing. What we find so gratifying at Construction Instruction is builders are now coming to us in advance of code changes even and saying "What should I be doing next?" Understanding they are really never done. And that's kind of a cool thing. An industry that in the past was a little bit reticent about change, that is, we've always done it that way. Now I'm recognizing that change is a good thing. Every other industry changes and improves, why shouldn't we? When they see codes changing by roughly 15% every 3 to 5 years, they see that as a challenge. They see that as a good thing. That's element number one, what we call the path of continued improvement. Understand that what you are building is probably great, but there are probably things that you could be doing or should be doing that could improve houses, what's really nice is, the same things you do for energy efficiency, also improve

air quality, durability, health and so on. A little example of that, we talked about challenges, and I mentioned earlier, talked about air sealing and air tightness of houses. There's just this little misunderstanding, maybe a little bit of angst in the industry of are we building houses too tight? And we would say, no, actually not. I always put it this way, if you ask one of your homeowners "Exactly how many holes would you like me to leave in your walls and attics?" They are always going to say zero. We've never wanted holes in our walls or attics, of course we've wanted a building envelope that is air tight, but we've always wanted houses to be ventilated. We used to provide windows for ventilation, in fact we still do, the problem is, homeowners don't seem to want to use them as much as they used to because of noise, dust, security issues, so they keep their windows closed. This angst about building a tight house and still making sure it is properly ventilated, and the answer is, absolutely. It's a really nice thing that can intermix between the ENERGY STAR standard and the Indoor airPLUS program standard, these two melded really nicely and understand that the two go hand in hand. Properly ventilated, mechanically ventilated, or windows is great too, so two ventilation systems possible, with a really well controlled air tight assembly. That's one of the challenges that builders face. It's really cool to see builders who now, in advance of code, air tightness testing their houses; understanding the dynamics of what that does for the building helps control air quality. The tighter the building, the better the opportunity we have to control the air for families living in the house. Wow, what could be better than that?

Nick Hurst: Absolutely. You know sometimes when it comes to bringing those brands together, ENERGY STAR and Indoor airPLUS, there is a lot of other opportunities for green buildings and high performance homes in the market place. There are some builders who do have some reticence to talking about indoor air quality with their home buyers and in part maybe because they are fearful of applying some type of guarantee to the homeowners that their kids are going to get better or their family is going to automatically live a healthy life as a result of living in this home. What do you say to kind of encourage the home builder to take a good next step and implore some of these construction practices into their methodology and still pass along that value to the homebuyer and be able to communicate it to them in the process?

Gord Cooke: And again, I really like that question Nick, because I had heard that over the years. We're not very good at saying good, better, best. We're not selling the LT, the GE model and adding up options. Buying a new house is a pretty complicated thing so homeowners have a lot to think about. Let's be clear, their expectations are that you are already doing this stuff. Then they are kind of surprised to find out that you're not doing them. Unfortunately, in some parts of my working world, I end up doing a little bit of forensics. That is builders that didn't meet the expectations of the homeowners who moved in and the most common thing I hear homeowners say is "If only someone had told me, if only somebody had helped me understand why this would be important, I would have been happy to do it." So, two opportunities here. One from a marketing standpoint. What could be better than a label that indicates you are doing something a little different, starts a great conversation. But when thinking about that conversation, what I always feel is most important, rather than try to sell, just help them understand why this might be important to them. That all starts with good questioning. I spend a lot of time with builders and more importantly their sales agents and sales representative to help them understand how to simply highlight the need for these kinds of elements in houses, just by asking the right questions. A good example would be simply asking folks, "Anybody in the household with allergies or asthma, respiratory problems?" We're not medical professionals, but in fact, as housing

professionals, we do know the things that can make the air as healthy as possible. We're not going to cure your asthma or allergies, but wouldn't it be nice to know that your son or daughter, family, is breathing the healthiest as possible air. We can make very reasonable claims, very substantiated claims. We are simply doing the things that somebody else, we often talk about this to builders, don't tell people you are building a healthy house, tell people that you are building elements into your house that somebody else has deemed to be healthier. What could be better than the EPA and the Indoor airPLUS program in order to highlight the key things that really make a difference in houses? The use of the label and checklist, I see no reason why a builder couldn't ask a few important questions, "Anybody in the household with asthma? What has your experiences been? What are your plans in the house in the future?" And then just show them the elements that you feel, as a housing professional, would match their lifestyle. Because you work from home, here are some elements we've included. Because you have a garage that is underneath your son's bedroom, here are the things I've included. These are things that make sense, based on my experiences as a builder, and homeowners will agree with you every time.

Nick Hurst: Right, great points. There's a lot of focus in the industry now a days on smart technologies, interactive technologies. I think we'll see some of that over the next few days, here at the International Builders Show. Certainly smart phone apps, I think that you are currently working on an app as well. Can you tell us a little about that?

Gord Cooke: Yeah, Construction Instruction, it's actually more of an app specifically for the building industry and education. My two partners who I am very pleased to work with, my mentor Mark LaLiberte and Justin Wilson they developed this really cool app that is really just an educational tool. What is does is it takes all the building science elements and puts them in a digital format with little animations. So you can simply show your trade base, without language barriers, here guys, do it this way, just watch this video. Did you watch it? Do you want to watch it again? Because if you don't do it that way, I'll have you do it again. So little 45 second maybe a minute long vignettes on how to properly do a rain screen, how to properly insulate a basement, how to properly water manage a foundation. Great sponsors in the program, Tyvek, Cosella Dorken, Owens Corning, some great folks who have helped us with this. We are very excited because it allows us to do building science education with a bit of a takeaway. It's a free app, downloadable, ConstructionInstruction.com. You know there are lots of people that use it on a daily basis, construction guides, for builders, just to help them educate and communicate the changes that they want to make in their houses.

Nick Hurst: Excellent. We hope to take a look at it very soon and hope others can find it useful as well. We certainly appreciate you taking the time to sit down with us today Gord and talk about building science and, of course, share your expertise. We will let you get back to your preparations for IBS and we hope you have a great week here at the show. For those of you listening, you can find out more information about Gord from his website ConstructionInstruction.com. And be sure to check out Indoor airPLUS on Facebook and follow us on Twitter at E-P-A-i-a-PLUS (@EPAiaPLUS). Thanks again for listening.