

Protecting our Homes From Above & Below

Andrew Pace: Welcome to the Non Toxic Environments podcast. My name is Andrew Pace. Every week, my cohost Jay Watts and I will discuss healthier home improvement ideas and options. Thank you for finding us and please enjoy the show.

Hey folks, welcome back to Non Toxic Environments podcast. This is Andy Pace and Jay, sounds like we got a fantastic topic for us this week.

Jay Watts: Yeah, it's all about being up in the air, Andy up in the air and what I mean by that is we're going up on the roof.

Andy: It's actually raining out here. And so this is a perfect topic for this week.

Jay: Excellent man out here in California. It's as hot as it can be for April, late April. So talking about rain on a roof is where we needed to begin.

Andy: I'll just preface it by saying this too, as long as we're talking about roofing. Let's also talk about the other aspect of weatherproofing your home, which is, okay, so we're up on the roof and then we're also going to go down below and we're going to go waterproofing the foundation because I think these two things right now based upon the time of year we're in and what's happening in construction actually tie in really well together.

Jay: Yeah, I agree with you. Let's go.

Andy: So when you think about roofing in on a residential project, I think just about everybody thinks of asphalt shingles. That's really because I would say in residential roofing, well over 90% of the projects are done utilizing asphalt shingles. Asphalt shingles are the least expensive type of roofing available for a residential project. Nice thing about asphalt is that it's available everywhere. Contractors just about everywhere know how to put them on. They're easy to install. You don't need real specialty roofing contractors to install. And we'll talk about those things in a bit. But it's a product that people can install rather easily. The life expectancy, this is one of the downsides, 15 to 30 years maybe. Depends on the quality level and how well it's installed. And then from a pricing standpoint in the roofing industry, I'll let you know, they typically price out roofing materials by the square. And that's not by the square foot. I mean you think of all the other things that we sell, it's priced up by the square foot. It's actually by the square, which in roofing parlance, that means a 10 foot by 10 foot area or 100 square feet.

Jay: That's very interesting.

Andy: So in pricing out roofing materials and asphalt shingles price anywhere from 50 to \$150 per square. Now let's talk about health because obviously our listening audiences is really concerned about health of the occupant. If installed properly and if the home and attic, if there is an attic, is properly designed so that you don't have negative pressure in the house sucking air from the roof into the house, then to me the roofing material that you use is less likely to be problematic. Years ago when I developed the Degree of Green program, we also had this kind of spin off of the program that I called a healthy value engineering. Now, you've heard this term before, Jay, value engineering on a project is where the contractor or somebody involved in the project is trying to reduce the overall cost for the owner. And they do it in a way that doesn't go

against what the intent of the architect was. So yes, if we can make the job look the same, reducing the price, but the intent is still there, it looks the same, it performs the same, then that's what value engineering is. Healthy value engineering in my opinion is- if you've got \$40,000 in your budget for roofing on your project and it's going to cost \$40,000 for asphalt shingles and maybe \$120,000 for metal roofing, are you really going to get \$80,000 worth of additional benefits out of the metal roofing or are you better off saying, well, we should take that extra and maybe put it into something else in the project where it makes sense they are impact.

Jay: Oh, absolutely. That's the only way to think of it. I don't think there'd be any way you could argue that, you know, I'm going to spend that much more money and I'm going to get that better performance out of the roof. I don't think you can draw that conclusion and I think you're right. I think you have to go back and say, okay, we can do the \$40,000 job, we'll get a really good roof and we can take that money that we were thinking about spending on metal and put it into something that will benefit us maybe even more.

Andy: Right. And I think it comes down to a number of factors, not only the cost, but then the life cycle of how long are you going to stay in this house? You know, if this is your life ending home, no matter how long you'll be on this planet, you may consider going to one of the other roofing materials we're going to talk about because maybe you are somebody who just never wants to worry about maintenance and you put a value onto that. Asphalt shingles, you know, in 15 to 20 to 30 years you're going to be replacing. Well do you really want to have to have that countdown in your mind, knowing that every year you're getting closer and closer to having this project done again?

Jay: Yeah, I think that discussion is interesting cause if we were to do a polling of our listeners and say, Hey, do you really want to worry about maintenance issues? I think most of them would say, well probably would like to reduce that idea as much as possible. Of course.

Andy: But it comes down to, again, the individual. And so we get this call all the time from clients- what would you recommend for roofing? And I can't really recommend any one of these over the others because there's so many factors involved. I mean obviously budget is the biggest thing for everybody, but how much do you value the comfort of never having to worry about your roof? Again, if that's the case, if a customer says, we've got the money for a very good roof and we can afford a lot more for the roofing material, what do you recommend? So there are steps up. Metal roofing is going to cost you anywhere between \$100 to \$650 per square. So obviously we're talking about between double and quadruple the price of asphalt shingles. Yes, higher initial cost, but you're also looking at something that probably carries a 50 to a hundred year warranty. You know, it's nice to know that in your lifetime you're probably never going to have to touch that again, in most situations. Metal roofing sometimes there's some issues with the sound of rain or hail on a metal roof in our climate here where you have higher snow loads, you've got to be concerned about in the middle of winter, sliding snowbanks and avalanches off your metal roof. I mean there are ways to deal with that.

All right. I didn't talk about wood shakes at all. Cedar shake roofing, mainly because it's just not done much anymore. Cedar shake roofing is usually about the same price as an asphalt or a little bit more. It's a very difficult install. The labor used to install that. It's a dying art, honestly.

Jay: It reminds me a lot here on the West coast and in the Southern, the desert States, Arizona, New Mexico, Colorado, tile roofs are a popular trend and what we see in here in San Diego, with the Spanish Latino influence in construction, I think similarly to what you're saying about shake, you're not gonna see a lot of that kind of roofing any longer unless the architectural design demands it.

Andy: Right. And you know, tile, if you're looking at either like a clay tile or a Spanish tile, that's kind of how that has that ribbed arch look, you're looking at anywhere between 300 to \$600 per square. Yeah. So very, very expensive. It's also incredibly heavy. So you have to have a roofing structure that can support the weight for it. But yeah it's going to last. I would look at some of the buildings in Europe that have Spanish tile that have been around for hundreds of years. Not much maintenance. It's noncombustible it's really good for fire retardants, but there's a price to pay for that.

Jay: Sure. I was just going to say being on the outside, I'm always thinking, okay, we're going to go on the inside, on the other side of the roof. So I guess we'll get into that discussion here shortly.

Andy: Yeah. So the other thing I wanted to bring up about roofing materials: so you've got asphalt shingle on the low end, you've got your tile. I would say on the upper end, I mean we're not going to talk about slate because that isn't done much at all anymore. Because as you're talking about a thousand dollars per square or more, you got your metal that's kind of in between depending on the quality level. There's also another one that's in between and it is a, what's called a synthetic slate. Synthetic slate looks like a real slate tile or a clay tile or looks

like a Spanish tile, but it's made of recycled rubber recycled plastics. This is a product that's starting to become more known in the industry. Certainly not as inexpensive as asphalt, but not nearly as expensive as it's natural counterpart. And it gives you the longevity, the durability and low maintenance as those other high end products have. I think the biggest downside to these synthetics, again, besides the price if your budget is for the asphalt, the biggest downside is there's not a lot of contractors in the country that had been fully trained on the installation of the product. So if you happen to live within an area that has a good representation or a manufacturer of these products here in the Midwest, we've got a couple of manufacturers. If you're outside of those areas, sometimes it's difficult to find a contractor who really knows what they're doing.

Jay: Just came to my mind. What do you know about the evolving world of solar roofing tiles?

Andy: Well, I what I do know is probably enough to be dangerous on that. But I do know that the solar tiles, although get a lot of publicity and a lot of good press out there, most manufacturers of them are clearly just in design development stage.

Jay: Oh, okay.

Andy: They're not ready for prime time. This is not something that is just available for homeowners. I just wrote a story recently about how Tesla had to pull back on their pilot programs. Just not ready yet, but you know, this is something that eventually will be available. I just don't see it as something that will take over the industry quickly.

Jay: It's going to be awhile, no question about it. You've got to develop the technology and make sure it's solid and then you've got to have the people that know how to install it. And that takes a while for people to be trained and bring it up to speed.

Andy: And keep in mind too that some of the best solar panels on the market, the panels themselves last 30 years before they have to be replaced. Well at 30 years, you're at the high end of the life expectancy of an asphalt shingle. So if you're spending a lot of money to buy these really high tech solar shingles that you'd have to replace every 30 years, I just don't think it's a viable industry yet, but we'll get there.

You had a question about what's underneath the roof.

Jay: Yeah, yeah. We're in the attic. Let's get in there and see what's up.

Andy: So you know, it's, it really is going to depend on the type of construction. Underneath most of these roofing materials you have to have some type of a roofing paper. Usually that's like an asphalt impregnated construction paper. Again, if the home was designed properly with the pressure is proper, you're not going to have to worry about any of that off gassing coming into the house right now. Also, you have to be concerned about where you live and are you susceptible to what's called ice damming. Ice damming is a problem that Jay will never have to face in Southern California. But here in the Midwest and in other parts of the country, the Northeast and Northwest, ice damming is where you have a snow load on the roof. So in the middle of winter here in Wisconsin, it's not uncommon to have a foot of snow on the roof. Well, if you have any leaks in the attic, any leaks from the warm air in the house, getting through the insulation up into the attic and it actually rises up to the underside of the roof. Or what happens

is that snow that's on the roof starts to melt. Well then at night it freezes back again and then the next day it melts a little bit. Then freezes melts and freezes. And folks, this'll happen all throughout winter. And then what happens is you end up getting what's called an ice dam on your roof, where if some of the snow, let's say you start to get warm days, snow on the roof starts to melt and it slides down the roof, hits that dam and they can't go anywhere. So it backs up and actually goes underneath the shingles and can get into the attic, eventually get it into the house. An ice and water shield replaces the asphalt paper on your roof deck. It's a peel and stick membrane usually put one or two layers. It's a three foot wide roll so that it eliminates the problems that occur with ice damming. So if you do get ice damming and water does backup underneath the shingle and it gets under to the roof deck, it hits that ice and water shield and then it'll disperse again just through gravity, it'll get underneath the shingles, underneath that ice dam and eventually drain away. So it doesn't get into the house.

Jay: It's just a common practice in these areas where they have that issue. Various part of the installation?

Andy: Yep. Very common. I usually tell my clients, if you're in an area that has a high incidence of ice damming to do two layers up of the ice and water shield. Now with some of the other types of roofing materials, specifically metal, this isn't an issue if you get an ice dam. So what, water just keeps on backing up, keeps on backing up. There's no seam that the water can get into or under.

Jay: It's just going to drain.

Andy: Exactly. So that's really where we're looking at for the roof assembly itself. In the attic in the home, obviously insulation and air barriers and so forth to keep the ice damming from happening. For the most part when it comes to roofing materials, these are the most common materials we talk about, the most common questions that come up and hopefully it's enough of a primer to get you to the next level.

Jay: Yeah. So you want to go down now to the foundation?

Andy: Well, I do because I do think that as you're trying to keep water from getting into the house from above, keeping water from getting into the house from below is just as important. Folks, it's a common theme here on Non Toxic Environments that we are trying to protect against moisture in the home, which can lead to mold problems. Again, there's going to be a difference of where you live and where, where you're building and whether you're not you have a slab on grade foundation or a crawl space or a full basement. What I'm going to be talking about right now will be for full basements because, again, Midwest and other parts of the country, this is what we're dealing with. If you're in a slab on grade structure, waterproofing is not necessarily something that you really need to concern yourself with. If you do have a crawl space or that full basement, waterproofing the exterior of the foundation is crucial. If you think of the way homes were built decades ago, if you had a basement in your home, basements were designed not to be livable spaces but to house mechanicals, right? You know, your HVAC system, maybe some storage, maybe your laundry and so builders would use on the outside of the concrete block or the poured foundation, they would use what's called a damp proofing coating. A damp proofing coding was really nothing more than like an asphalt coating that you might put in your driveway mixed with diesel fuel. And so they would either spray or paint that on the outside of the block or the concrete so that when they back-filled, it would actually

protect the concrete a little bit. And also it keeps some of that moisture in the earth from transferring into the block or the concrete. Downside is it's not very protective. And so as you're backfilling, aggregate, stone, whatever's in the film can actually scrape that material off and just due the nature of it, it starts to degrade usually within a few months of back-filling. And that's why basements have inherently been more damp because this type of material doesn't really do a great job of waterproofing. It gives you some moisture protection, but not a lot.

Jay: Yea, so this brings to mind the idea the initial stages of site evaluation and you know, taking a look at the topography to see how water is going to move. I know one of the methods that people will employ here when they're doing the foundation work is to actually French drain around so that there's a way for the water to move away from the wall as opposed to having to hit the wall and try to go through it. It can be drained off. And I know a lot of people will wind up doing that a lot of times after the fact that they discovered that their basements got a lot of hydrostatic moisture intrusion and then they realize, Oh, you know, we've got to deal with it on the outside. So then I'll have some contractor come in and French drain around their foundation to help mitigate the problem.

Andy: Exactly. And so you know, in today's building climate, if you are going to have a basement, they'll almost always put in what's called drain tile. So that as you say, when water hits that foundation slides down the foundation, it goes in the drain tile. And then a lot of times that drain tile most often is then tied into what's called a sump, which is essentially a large concrete bucket, a storage unit that holds this water that has collected around the foundation and then it gets pumped out to the sanitation sewer or to the street so it gets away from your house. The older the home is, the more likely that if there was drain tile, it could be clogged by now. You also have to be concerned about whether or not the the water table has risen in your

area. We see this quite a bit, with the way our climate is changing from decade to decade. We're getting water table rising in certain areas.

Andy: So I advocate for a more positive type of waterproofing on a new home. And what do I mean by that? Well, there's three ways to accomplish this. A waterproof coating, a waterproof membrane, or a rigid waterproof paneling. I'll give you an example. A waterproof coating for the outside of the foundation, something like the AFM Dynoseal. So Dynoseal is a really thick elastomeric coating that you can use to waterproof things. And I know because of projects we've done, three or four coats of Dynoseal on the outside the foundation is an absolutely wonderful waterproof coating so that your basement never gets wet.

Jay: And it can withstand what you alluded to earlier, which is the backfield challenge when the gravel and such gets pushed into the wall system, the Dynoseal at a level of mill thickness level that it can handle that. So you're not puncturing it. The way you described it was very accurate. It's like a puncture of the membrane is not going to happen with this.

Andy: Right. And, and the nice thing about Dynoseal is because it always remains a little tacky when it's cured. If you do have any desire to add some insulation to your foundation, you can actually before backfilling, after you've done your Dynoseal you can actually put up a three quarter inch or one inch thick rigid poly insulation on the outside, which also keeps condensation from occurring because it insulates the foundation a little bit. And now I think that there are other brands of liquid membranes on the market. I use Dynoseal because it's obviously the healthiest one that we've dealt with over the years. But there are liquid, waterproof membranes that are out there. And if you are going to be using your basement as a livable space or you do not want to risk moisture intrusion that could lead to mold, you

definitely need at least a liquid waterproof membrane. Second thing would be a peel and stick membrane. Something like, as an example, like the Henry Blue Skin, it's a brand that we've recommended over the years. Henry Blue Skin is a peel and stick waterproof membrane. So it comes in a roll of a couple hundred square feet and it's designed to adhere to the foundation, but it's got a really thick, like a 60 mill and the mill is a thousandth of an inch, so it's 60 mils thick and it gets attached to the foundation and folks, it's not going anywhere. And so you install this, you make sure you lap the joints properly and that's something that you also could insulate afterwards. But this will be a very positive type of a waterproof protection for your foundation. The self adhering adhesive itself, again, if you design your home properly with the proper pressure in the home, I would not worry about any of that off gassing and coming into your house. Now the third thing I'd recommend if the budget allows, because we're kind of going good, better, best here. If the budget allows, I'd like you to do something that's called a plastic dimple board material. Years ago, there's a company out of Europe called Platon that developed this, this thick plastic board that had all these dimples all over it. Now there are several brands of this on the market, but this gets attached to the foundation and this the dimples actually hold the plastic paneling itself away from the foundation by about an eighth of an inch. And the beauty of this is if water were to hit the foundation from the exterior, the plastic panel allows that moisture to just drain all the way down. If water were to get around it somehow from the top side, maybe there was a detail on the top above the foundation that caused moisture to get behind the waterproofing and hit the concrete, the dimple board holds the actual waterproof material about an eighth of an inch away from the foundation so that it allows for evaporation. So it's a really unique type of waterproofing, but it is the most expensive of these three that we've talked about because it's more of a system and it requires a little more labor to install.

Jay: Well, again, it comes back to kind of timeframe, right? Right? And you know, how long are we planning to be here? How much maintenance are we going to be concerned about or worried about? Right? So you have to factor that in folks when you're budgeting and deciding, you know, where's our comfort level here? I mean all things being equal. I think everyone would want to do the best thing you could possibly do. But you know, it has to be a function of what our budgets tell us we can do.

Andy: Absolutely. And really when it comes to something like the lower level of a home, if that lower level is an area that you are going to be using a lot and you've got an entertainment room down there, maybe some bedrooms, I think that I'd rather have you spend some of your building budget on a better waterproof system for your foundation. Then on a more a stately looking roofing material. You'll definitely gonna get your money's worth out of the foundation waterproofing.

Jay: Absolutely. You know, we have challenges. Our clients call us and tell us that they've got moisture coming into their basements and we know that the outside either is degraded or was never treated properly. Now we have to fight that interior moisture and that's a very difficult thing to do.

Andy: Well, for anybody who I've talked to over the years that who has asked me to help them with a basement remodel and as you say with moisture in the basement, I usually don't hold back when I say listen- basements for not designed to be lived in 50 years ago. The only way to positively waterproof the basement is to then excavate the entire foundation, waterproof it and then refill. That's a huge expense. It costs you a fraction of that to do it right from the start. I know we've talked about a lot of things here folks today and roofing and waterproofing are

obviously two very important parts of your home, but it just made me think of another thing, Jay, when we're talking about the foundation waterproofing, I mentioned the Safecoat product, the Dynoseal. I would love for you to tell folks about this because in the last month and a half, the sales of Dynoseal will have skyrocketed across the country and it's specifically because of the time of the year and it's not because of waterproofing foundations. So why is that?

Jay: Well, I think people, because of restrictions that have been placed on us with a COVID 19 people are hearing the message that maybe it would be wise for you to think about growing your own food, setting up your own backyard, a vegetable garden. And so I think a lot of people now are taking that seriously and they're actually building their raised bed gardens. And over the years when people have come to us to ask about, well how do I deal with water issues in a raised bed garden? Two issues, I'm going to build it out of a wood. So I want to protect the wood longterm, but we're like really concerned about is I don't want to adulterate the dirt with the coating on the inside so that my plants are poisoned by some leaching from a coating on the inside. So what people have been doing is they're using our Dynoseal as the waterproofing coating on the inside of the raised bed where below the dirt line, and then across the bottom will Dynoseal that, that protects the wood from waster intrusion and it's nontoxic so it's not going to pollute the soil, so we're good there. And then coming around above dirt then we can switch products so we can allow the wood to show its natural color and its natural figure. Dynoseal, just to describe it real briefly, it's very elastomeric and rubbery and it stays kind of tacky, but when it dries, it's almost black. It's very, very close to black. And the thing about Dynoseal is when it's exposed over a long period of time to sunlight, it tends to start to weaken a little bit. And we have a system for covering Dynoseal when we are doing a back to the roof. If we were up doing a flat roof where we were going to use coatings as a part of that system, we make a product that can protect Dynoseal from direct exposure to the sun. That product is

called Roofguard. It's white for reflectivity purposes to keep heat buildup at a minimum, but most people don't want to paint their raised beds white. They prefer to have their bed look like the wood itself. And so Watershield, which is a clear coating that can go over exterior wood, that's one way to keep the wood protected from the outside of the box. That's probably the easiest one. I tell people, Dynoseal below the grade, below the dirt line and then water shield on the rest of the box. And that gives you a good one two combination to protecting plants and the material, the wood

Andy: That's fantastic. It's what a great use for that product of Dynoseal for raise garden beds like that. It makes tons of sense. You're trying to protect the wood from wood rot, use something that's not going to taint the vegetables. So great. That's fantastic. Thanks for that Jay.

Jay: I'm planning to do my own pretty soon here in my backyard. So the request has been put in to get busy with that.

Andy: Everybody's making lists these days, aren't they?

Jay: It's been a great show. Andy, I think our listeners are gonna really appreciate this.

Andy: I hope so. You know, these aren't real sexy topics, you know, but I think they're very crucial to the entire building process and I hope that if anything, I hope it generates some thoughts. And if you do have any questions, please feel free to reach out: andy@degreeofgreen.com as always, we really appreciate you listening to the show. If you

have any ideas or suggestions on topics, we'd love to hear them because you know, Jay and I are always looking for things to talk about with you folks.

Jay: We are, we are indeed. And I feel like we're a big family, and we're growing and we're a growing family. I find a lot of pleasure out of knowing that and sharing all these ideas with our listeners.

Andy: Yeah, it's been a fun ride so far. We want to continue this as long as we possibly can. So in order to do that, folks, we'd love if you would go on to iTunes and leave us a rating and a review. The more ratings and reviews we have, the easier it is for others to find the show. And with that, Jay, we'll be back next week with another episode of Non Toxic Environments and have yourself a good week.

Jay: Same to you, Andy.

Andy: All right.