



Mold Remediation Part 5: Engineering Controls

DM

David Myrick

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KS

Kendra Seymour

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Hello, everyone. Welcome back to Part Five of our Change the Air Foundation, Remediation: 101 Series, where we're going to be talking today about engineering controls that are critical to the success of your remediation project. Because they protect the rest of the home from further contamination and allow for more effective remediation and a safer work environment for those performing the work. So David Myrick is back today to take us through this part of our series. And if you didn't check out Part Four, where he talked about PPE, I read his bio there. You can definitely go back and listen to that. It's a great episode. But he has been in the remediation business for over 17 years, and is the owner of Valor Mold Removal in Virginia, DC area. So David, today I am super excited to jump right into engineering controls, because this can sometimes look a little like, you know, E.T. (not to date myself). Proper containment and things like that can be a little unnerving to a homeowner or renter if they were to see it. But it's all there to keep you safe. So I can't wait for you to share with us what you have. So thanks so much for being here.

DM

David Myrick

2:28

Absolutely, my pleasure. And this is such an important topic, because it's definitely one of the areas that is not done very well. Most remediators will build containment, but they don't negatively pressurize it. They go hand in hand. You have to have both. You have to have containment. You have to have the negative pressure. That's what protects you. And so it really behooves you to know what you're looking for, what you're looking at, to be an informed consumer and really just being your own advocate to protect your health. So I'll jump right into the presentation. So yeah, here we are with Part Five: Engineering Controls. Now, everything I talk about comes out of this. This ANSI/IICRC S520 Standard for Professional Mold Remediation. This isn't just a book. This thing right here, this little symbol, this ANSI symbol, that's the American National Standards Institute, and this is a big deal, right? If there's ever a lawsuit, this is the book that the lawyers are pulling out to go, "Did you follow the ANSI Standard? If you didn't, why didn't you?" And you have a very big uphill battle to fight. And so would you...If you're listening to this and you go, "Says you." "No, not 'says me,' says *that*," right? And good luck to anybody trying to argue with this, because in the pecking order in America, number one is a federal regulation, which there are none for mold. There is for asbestos in commercial buildings (actually not even for residential) but there is none for mold. So second on the pecking order is ANSI standards, right? They write all the standards for the private industry. And then third on the list would be the guidelines you see for free on EPA. You know, CDC is one, New York City guidelines, things like that. And the problem...the only bone I have to pick with the ANSI standard is, one, the public has no idea it's out there. Two, it's \$125 I think, to buy it. And then three, it's written in our language, right? It's written in professional jargon. And yeah, you can slog your way through it, but most people have lives to attend to and jobs and things, so it's just, it's not very user friendly. But, you know, I guess that's why you hire an expert, is to have us interpret it and you know, carry it out. If you are going to buy one, just be aware, there is a Reference Guide to it that has more of the plain English version of this. And so a lot of the things, like in the S520 it says the remediators should establish pressure differentials, but they don't actually detail what that means. Right? It's more of like a brief...a brief sentence. And in the Reference Guide, they get into more, actually, what that is.

DM

David Myrick

5:08

So for a brief history of what we're going through...You know, again, mold is nature's recycling program. Its job in nature is to decompose dead organic material. And the thing is, people always focus on the (where's my laser pointer)...So people always focus on the visible mold growth, right? Because that's what you can see with the naked eye. And so they think that it's all about getting rid of the mold colony. And the thing is, yeah, if you hire us to remediate mold we're going to remove the mold colony. But the problem is, at the surface of this colony—if you took a cross section of this mold colony—you'll see these little hyphae rising up from the surface like stalks, and at the tip are the mold spores. And the problem is, the mold spores behave just like dandelions. So the second you cut out that colony or spray it or disturb it, or do whatever to it, these spores go airborne by the billions. Because their job in nature is to go spread amongst the earth and grow in areas

that are wet, and do their job (which is to decompose organic material). So this mold spore contamination is really what...that's what we're worried about, right? The spores are, what cause most people's health problems. Right? Spore inhalation. It's not because they're looking at mold colonies. It's because they're breathing in spores. And so the spore control is just absolutely critical to doing this work the right way.

DM

David Myrick

6:38

Now, each project goes in four basic stages. So there's containment (I have listed up here), Containment, Negative Air, Demolition and Cleaning, which I'll get into and subsequent episodes. But here we have a containment built around a moldy wall. So this is 6 mil heavy-duty plastic held up by tension poles. And then we seal the plastic to the ceiling, walls, and floor with tons of tape, so it actually forms a wall. It forms a structure around the mold. And I'm going to get back to this diagram here in a second, but this is a top-down view of that same chamber. So again, you have the containment barrier, you have the moldy wall. As we're tearing the mold colony out, these spores are going to go airborne again by the billions. And so we want to prevent what's called cross-contamination. And so cross-contamination is our version of malpractice. That is where we have...We're tearing out mold in one area, and the spores are going airborne and going into other parts of your house. And because the mold spores are microscopic and odorless, you can't see them, you can't smell them; so you, as the homeowner, have no idea that the remediator that you hired to remove the mold is making the situation way worse.

Because when we're doing remediation and we're cutting out all these moldy materials, it's like kicking the hornet's nest, right? So all these spores are going airborne. And so this negative air pressure that we set up, the...again, you have the containment, and we set up these negative air machines. And so what these things are, they're basically air purifiers with HEPA filters inside of them. And so they draw air in and filter the mold spores out internally, and then the clean air we duct out of a window. And people go, "Why in the world [are] you guys HEPA filtering air just to blow it outside?" And the reason for that is, as these spores are trying to migrate and move their way outside of the containment, they're being met by a wall of air coming in, right? Because, again, the ducting for this machine is going outside, and so there has to be makeup air coming in to feed this machine. Or else, if you didn't have makeup air, the whole thing would just crumple in on itself, like putting a plastic bag over a vacuum nozzle.

And so this negative air pressure is critical to effective remediation. It's critical to keeping you guys safe while the work is going on, and it's also, too, critical to keep my guys safe. Because, like I said in the previous episode, even though we might wear PPE, that's our last line of defense. Our first line of defense is actually this; is to clear that air as quickly as possible. Now, (where did it go? There it is) we have an InstaScope, which, again, is a machine that does instant airborne mold testing. Now, for our machine for the DC Metro area, the average mold spore count in a room at rest with nothing going on is 4,600. The range for the airborne spore count during a remediation is anywhere from 1.5 to 4 million. So again, this is why I say it's like kicking the hornet's nest. So inside that containment 1.5 to 4 million. And you know, these numbers are just drastic. The airborne spore count just

absolutely skyrockets. So again, we don't want this to leave the containment. This is critical to our health. It's critical to your health. This is just...it's almost Mold Guide 101, and it just...This is one thing that remediators do not do well, and it just aggravates me to no end.

DM

David Myrick

10:03

So going back to this diagram, the Mold Standard says that the containment should be under -5 Pascals or more of air pressure. Now, Pascals is a unit of measurement comparing pressure between two spaces. So it's comparing the pressure inside the containment to the pressure outside the containment. And this little yellow guy here is called a manometer. And so this is what we actually use to monitor the pressure, because when you start cutting open walls and ceilings, it's like opening up a window. It's like a pathway where additional air can come in, and so your pressure will drop. And we need to know that so we can go ahead and take measures against that, either cranking the machine up or sealing up gaps or what have you. Right? There's many ways to fix it, but you can't know that without monitoring the pressure. And so again, you'll see this where companies will put this in their proposal, that if the plastic sucks inward, then the containment's under negative air pressure. And we're like, "No, the...you can get negative air pressure, where the plastic's sucking in off -2 Pascals." So you're way above...way below the standard.

So the two things you're looking for as a homeowner when the remediator is starting work is, one, you're looking for this manometer, and then two, you're looking for ducting going out of the window. So if you have those two things going on, then you're in good hands. Now sometimes you can have projects where windows won't open, or the closest window is, you know, 300 feet away, or something. And there is a way that you can go ahead and duct the containment...duct the negative air machine, into the living space. But the negative air machines don't filter out odors, and so this is why we like it to go outside because if we start pumping air that smells moldy into your house, good luck trying to convince people that you're not cross-contaminating, right? Now, this little, yellow...this little blue guy here is called (the technical name for it is an AFD) an Air Filtration Device. The name changes depending on how it's set up. So if you exhaust, if you hook up a duct to the exhaust, and exhaust that out of the containment, that's called a Negative Air Machine. Whereas, if you have no duct attached to it, then it's called an Air Scrubber. And one of the red flags is if in the proposal, or you're talking to the remediator, and they keep saying the word, "Air Scrubber," it's a red flag that they're not going to set up negative air pressure; that they're just going to have the containment under neutral pressure.

DM

David Myrick

12:30

And I will concede that okay if they have set up containment, they have an air scrubber, that's better than having your local handyman just come in and tear things out with nothing set up, but they're not meeting the standard. And to give you an analogy, not doing negative air pressure, if you just use an air scrubber, it would be like if you went to the hospital with something contagious—like COVID or tuberculosis—and they just put you in the hospital room with an air scrubber next to you, right? Instead of pushing...putting you in an isolation room. That's not what the hospital does. If you have something contagious,

they put you in the isolation room (which is...it is a negatively pressurized room) so that way you're not going to spread your stuff through the hospital. So you'll hear this too from some remediators. They go, "Oh, negative air pressure is the old way of doing things." No, it's not. It's absolutely not.

Now as for what this actually looks like, I took a video of a project, and you'll see the...you see the plastic sucking in on the tension poles. And that's the reason tension poles are there, is because you can't just staple this to the ceiling. You have to have the rigidity like they're like ribs, you know, to hold that plastic back. And this is the manometer, and it's digital, right? And so we're at -6, so we're one above what the standard is. And so when I close the zipper, that seals up a gap, and you'll see that rise. So now we're putting more negative air pressure in that containment.

And then when I undo the zipper and let more air in, you're going to see that number fall. So it's letting more air in, so we're having less pressure. Now there is an upper limit. You don't want to have too much negative air pressure. The limit, I think, is -12. I mean, yeah, technically you could go up to like, -15 or --20, but you know, at what point are you just adding this for no reason?

Now, as to what good versus bad containment looks like...So on the left, we have an example of good containment, right? This looks clean, this looks straight. It's solid because these are temporary barriers. But you want to build them strong enough so that way, as you're moving in and out, or you're carrying trash, or you're carrying equipment or what have you, it's tough, right? It's going to stand up to guys banging into it and things like that. I mean, now, granted, it's not a solid wall, so you don't want to abuse it, but it needs to be somewhat tough.

On the right, this is actually a picture I took at...during an estimate. Right? I didn't make this up. This is a client who called me in, "Hey, we had remediation done, and it just looks terrible." And the thing is, this isn't me picking...you know, cherry picking, the worst of the worst. This is routine. The containment, the plastic is coming off. It's built with blue tape, by the way. Blue tape...a lot of companies only like to use blue tape because it tends not to take paint off of surfaces. Whereas over here, this isn't just blue tape. This is actually double-sided tape that goes against the door frame. It's taped to the door frame, then the plastic is taped to the double-sided tape. And then the blue we just put around the edges, just as a double measure. But the majority of the work, of the strength of it is that double-sided tape. And yeah, we have clients complain, "Oh, you took paint off." "Okay. I mean, do you want mold to come out? What are we here for?" Right? "What's important to you, repainting or having mold all over your house?" So...

DM

David Myrick

16:04

Freestanding barriers on our left, again, this is what it should look like, right? We have the tension poles. Now this, by the way, is I'm standing inside of our containment. So this isn't what you would see from the outside, if you were the homeowner looking at containment. It wouldn't look like much. But from the inside, again, you see the plastic taped to the

floors, taped to the walls, it's taped to the ceiling. You have the tension poles. You have a foam bar up here, foam rail to hold the tension of the ceiling. On our right, this is a picture I grabbed off of a competitor's website. So this is what they thought of themselves, that they would actually put this on their website as if this is something to be proud of. And I'll get into what is actually wrong here. So along the top, this isn't taped to the ceiling, right? This is loose. It looks like maybe there's two pieces of tape here, and yeah, they have tension poles, but all the rest of this, I mean, look how this droops, right? It's just very poorly done. Same thing along the bottom, this looks like carpet. You absolutely, absolutely can tape plastic to the carpet. It's not gonna hurt the carpet. But again, it's just it's very loose. It's very floppy.

And then on left side here against the wall, one piece of tape holding this up. So it's just sloppy containment. It's poorly done. It's not very tight. It's very leaky, very leaky. So the only rebuttal that this company could say is, well, we manhandle it with tons of negative air machines right? Inside here we have whatever, 2, 3, 4 machines going. We know we have pressure, which I would need to see proof of that, but that would be the only way that this containment would work. But I can almost guarantee you that's not, right? This is sloppy work. It's sloppy, sloppy workmanship.

So in our little Hall of Shame, you know, this is, again, an estimate I went to. You have the plastic stapled and taped to the ceiling. And again, it's just not going to have a very tight barrier. It's not going to have a tight seal. It's just sloppy workmanship. And then here we have 1 mil plastic. Now, I can tell this just by looking at it. I don't expect your average homeowner to be able to do that. But basically, anything that you would use to cover furniture, right? It's a very light, flimsy, almost like what you would use out of trash bags, right? What trash bags are made of is 1 mil, sometimes 3 mil, but 6 mil is the standard, right? And this is a very thick plastic. So again...and as you can see, their containment fell down, right? I didn't do this. This is...I walked in and found it like this. So again, what good is containment, if it falls down on you randomly? And then here, this is another one I went to. This is an estimate I was at. Now, at least they had a little sign on the containment right, warning that the remediation was going on. But just by the fact that there's no tension poles here means that there was no negative air pressure. Because if you remember that video I showed, you saw the plastic just screaming against those tension poles, right? There, it's just screaming against them. So there's no way this containment was under negative air pressure with no tension poles. It's just not going to happen.

DM

David Myrick

19:22

Now, Decon chambers...That's one bad thing about the diagram I made (in whatever the slide that was 10 slides ago)...is I didn't include pictures of the Decon chamber. Because I use that really, to educate people who are more towards the beginning stages of their mold education journey, if you will. So a Decon chamber is a way for us to enter and exit the containment area and maintain negative air pressure the whole time. So here I have two pictures. This is actually a training class. I was in Indianapolis, and we built one in a warehouse. So nevermind this, this is the containment area. This is the actual, you know, containment, where the mold was inside there, but pay attention to this little box. So this

little box is the Decon chamber. And so...Now, they did it the old-school way, without zippers. They did it with flaps. But over here on the right, this would be a Decon chamber that we built.

So this is at the entrance to a basement stairs. So the containment barrier was over the door frame to the stairs, and then the Decon chamber was attached to that. And you'll see the zipper here. And the reason for that zipper on both the inner containment and the Decon chamber is—so let's say I want to take my suit off, or I want to bring equipment through, I want to bring trash through. I would unzip the inside zipper. Move my equipment into the Decon chamber, close the inside zipper, and then open the outside zipper, and then carry my stuff through, right? Assuming that I've already cleaned it inside the Decon chamber. But that's a way for us to move in and out of the chambers without losing our pressure, because the alternative is, if you don't have a Decon chamber, as soon as you open up that zipper, all your pressure is gone. It's all gone. Now, is it the end of the world? No, I wouldn't say so, but it's still just not...it's not good work. And there are projects, I don't want to talk myself into a corner because there are projects where we can't build one. Or the client says, "No, I don't want you to block my entire hallway up," right? "I still want to have access to other rooms." And then that's their choice, because when we have the zippers open, we're not just keeping them open all day, right? It's...You open the zipper, you do what you're going to do, and then you close it back again. So, but yeah, this is what Decon chambers look like.

KS

Kendra Seymour

21:39

Wonderful. I have a follow up question, then. Actually have two follow up questions, if that's okay. You said that it's typical to keep the containment under negative pressure. Is there ever a situation where you'd want to put it under positive pressure?

DM

David Myrick

21:54

Oh, good question. Good question. Yes. Oh, we, just gave a proposal last week. There's a client who they have like an overhang that sits...It overhangs their house, their basement, their foundation, and so they want us to blast the inside of that overhang. And so in their case, we would put, we put the Negative Air Machine outside, and duct the exhaust into the house, so that way the house is under positive pressure, because as we're blasting, we don't want that stuff to go inside the house. Another common scenario would be working in attics, and another common scenario would be if there's a crawl space beneath the room that you're working in. Now, you want to be careful. Well, no, it would be a crawl space.

So if I'm in the attic working, you just can't, you simply can't fit these Negative Air Machines into the attic. It's not big enough. The attic access hatch isn't big enough. Where are you going to...You know, how are you going to duct it out, right? Some roofs don't have vents, they don't have windows. And so yeah, in that scenario if we're doing a remediation in an attic, we put the house under positive pressure. So we'd, again, put the negative air pressure...Negative Air Machine in the yard, pump air into the house, and do our work.

It was interesting; we had a project many moons ago where one of my guys accidentally stepped through the ceiling, right? They're up in the attic. There's no floor. You accidentally step through the ceiling. So you stop everything, and you go to seal that up—just to, just to temporarily seal it up in the meantime. And it was funny, because I put plastic up there, and the plastic just sucked right to it. I didn't have to put any tape. I did anyway, just to make sure it looked good. But I mean, it...just off the positive pressure, I mean, it was just blowing all that air through. So again, this is a measure, engineering control, so that way we're not worried about cross-contamination. And the other scenario would be a crawl space. So if we're, let's say, remediating a crawl space, if we could do negative air pressure in the crawl space, then great. But again, same problem. It's...They're small attic or they're small access hatches. There's also two OSHA rules where you're working in a confined space, you don't want to block that up in case there's a fire or an emergency or something inside the crawl space or inside the attic. And so yeah, again, we would put the house under negative...under *positive* pressure. So I can't say it happens a lot, most...probably 95-98% of our projects where you...we're doing negative air pressure. But, yeah, it does occur.

KS

Kendra Seymour

24:25

Wonderful. No, that's super helpful. I have one more question, and it has to do with the equipment that companies use because I see this asked. So they do lots of jobs. They're in different homes every week, you know, maybe even every day, or every few days. Is there a protocol? Should they be cleaning their equipment between jobs? How are they not accidentally cross contaminating, you know, from one job to the next?

DM

David Myrick

24:49

That is a really good question. That is a million-dollar question, yes. Equipment cleaning and care and maintenance is a dirty secret. Matter of fact, it's a good word for it. It's a very dirty secret in our industry. Very little cleaning is done of the equipment. Yeah, it's definitely hauled from job to job. So like in our case, when we get into, I think, Episode Seven, with the cleaning procedure that's done, right? The equipment, anything that's in that containment that gets the outside of it gets damp-wiped, you know, HEPA vacuumed, it's all cleaned off. And at minimum, like on...with us, we're walking in with a new pre-filter right, in that machine. So the machine has a new pre-filter at the start of every job. And then when we're done with the demolition process, we replace that and we put another pre-filter in it. Now the HEPA filter (I don't know if you want to get into this), the HEPA filter is not replaced on every job. And that is something that a lot of people psychologically, they go, "Oh no, I want a new HEPA filter."

When you actually get into HEPA filter, when you talk to HEPA filter manufacturers and the people who study this, the older a HEPA filter is, the better it filters particles. Now there is a limit. I mean, after a year—because we track how long the HEPA filter has been in each project or been in service. So after a year, we replace them all. But then the machines also, too, they have a light on them that goes off. So if the HEPA filter is too clogged up, the light goes off. And so that way we know this thing needs to come out of service and needs to have the HEPA filter replaced. But yeah, you definitely want the pre-filter replaced every

single job, every single time, and the machine needs to be cleaned. Because, yeah, if you looked at the inside of these things, I mean, they'd probably be disgusting (most companies).

KS

Kendra Seymour

26:43

So again, if you head on over to our website and you download that Questions to Ask Your Remediation freebie, that's one of the questions on there that you can ask that gives you a little insight into their practices. David, thank you so much. This was wonderful. I appreciate you taking the time to walk us through this.

DM

David Myrick

26:58

Absolutely, my pleasure.

KS

Kendra Seymour

27:00

Now, if you found this helpful, definitely stay tuned for Part Seven, where we're going to get into some of that controlled demolition and removal. So it's just...We're getting more and more granular. And if you found this helpful, and you don't want to miss, you know, an update on when these episodes drop, do me a favor. Head on over to ChangeTheAirFoundation.org, sign up for our newsletter, because it really is the best way to get great information like this directly to your box. We'll see you next time.