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Ian Blanding: Welcome, everyone. My name is Ian Blanding. I'm with the Pacific Northwest National Laboratory and I'd like to welcome you to the USDOE National Energy Codes Conference Seminar Series. Today's seminar will cover Remote and Virtual Inspections and Their Applicability Today and in the Future. So looking ahead, this series will cover other timely topics such as what's new in the residential provisions of the 2021 IECC, Advanced Technology and Codes, policies for energy efficiency and resilience, among other timely topics. So we hope you will join us every Thursday at 1:00 PM Eastern to keep the conversation going.

So lastly, before I turn things over to our moderator, I'd like to ask a few polling questions just so we can get a sense of kind of who is in the audience. So if we could take just a minute and answer the poll that's on the screen right now.

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So as you can see, it looks like a good representation from the Southwest and the Northeast with kind of a mix from the Midwest and Southeast.

So our second poll that I'll launch relates to your profession. So if we could get a sense of kind of who is on the call that would be great. Okay, I'll go ahead and close and share this poll. So it looks like a good representation of code officials or plan reviewers, third party verifiers, a mix of architects and engineers and then folks from state, federal, local governments and universities. Well, thanks for that info.

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And so now, without further ado, I'd like to turn things over to our moderator, Michelle Britt, who is the director of Energy Programs for the International Code Council.

Michelle Britt: Okay, thank you, Ian.

Ian Blanding: Great, thanks.

Michelle Britt: Yep. So thank you for joining us today. ICC is pleased to be part of the DOE Energy Codes Conference Webinar Series and pleased to partner with the city of North Las Vegas in sharing some up to date information on remote, virtual inspections. The next slide.

Today, I'm joined by Dave Walls and Valarie Evans. Dave Walls is the vice president of Business Solutions of Support Initiatives at ICC, where he's been instrumental in ICC's initiatives on remote inspection. He has drafted a model program for electronic permitting through RVI which should be available early next year. Prior to joining ICC, Dave was the executive director for the California Building Standards Commission –

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and led the development of Cal Green for the state. He was also a code official for the count of Sutter. And today, he is gonna be leading us through a broad overview of what is RVI and how it can be employed.

And Valarie Evans is the building official for the City of North Las Vegas where she oversees the building and fire safety division, including the expansive remote inspection program. Originally an electrician, Valarie transitioned into code enforcement and has been with the city of North Las Vegas for over 19 years. She was the first female president of the Southern Nevada International Code Council in 2013 and was named the organization's Government Person of the Year in 2016. And we are very pleased that she is here today to share her city's experience with employing RVI. Next slide.

And so very briefly, today's presentation, we're – Ian.

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Next slide, thanks. We are going to cover a little bit about the overview of the RVI process, what are some of the challenges and the successes that have been experienced, and as I said, Valarie is going to share with us the Las Vegas experience and then we'll follow up with a brief description of some of the needs for training and where else it is – this is used across the country. Next slide.

So carrying a code book to the jobsite is no longer needed. They're available electronically, on the inspector's tablet or laptop or in bound copies back at the office. An RVI is a form of visual inspection which uses visual or electronic aids to allow a method – provides a way for an inspector or a team of inspectors to see the products or materials from a distance and this might need to be done because the objects are inaccessible or because they're in a dangerous environment, –

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or where circumstances or conditions prevent in-person inspections.

And when we think about the Energy Code, arguably we are all aware of the challenges associated with enforcement of the Energy Code whether it's due to staffing or training, perhaps lack of political interest or funding. And geography and population density play into it also, and there is a variety of other reasons. So I am very interested in the potential for RVI and the efficiencies that it brings and the involvement of the applicant to perhaps increase compliance with the Energy Code. I think there's potential for enforcement in wide open rural areas where it might not have been as feasible before. And potential for increased compliance with less of a time investment by the code officials.

So with that, I'll turn this over to Dave who will start giving us the highlights and broad overview of RVI.

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Thank you, Dave.

David Walls: Well, thank you, Michelle and thank you for setting the stage here, and next slide, Ian. So Michelle did a good job of explaining what RVI is, really the definition, but it boils down to, it's the use of visual or electronic aids, period, for the inspector to be able to inspect a project that's underway, and it allows the inspector to observe products or materials from a distance. And when I say distance that's not just six feet social distancing, it's – you know, it could be hundreds or tens or thousands of miles away. So it's all done electronically as long as there is a good connection. Next.

So why use an RVI? You know, today's phones and tablets have powerful capabilities for real-time online communication. I mean I think we're all aware of what the capabilities are these days.

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You know, I'm not a very young man so I mean this kind of stuff 20 or 30 years ago just seemed, you know, unrealistic, impossible, but here we are today living it and looking forward to what's next.

It allows construction projects to continue forward without

impediment. So, you know, the pandemic might have slowed things down but, you know, these are ways that allowed jurisdictions to continue providing those essential services, you know, to the builders to keep construction going, to keep the economy moving. And it's been broadly supported by diverse stakeholders.

You know, amazingly, I could say it seemed like even a few years ago, before this pandemic a lot were resistant. I think I would have been if I was working in a local jurisdiction to do much in the way of RVI, but boy, it's really been embraced. Next.

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So what are kinda the key steps to what we look at, again, from the broad perspective that Michelle mentioned. So with scheduling, really the customer works with the authority having jurisdiction to schedule them. Customer preparation, this is a key element, of course, they need to prepare the jobsite and devices, and I'll go into all of these in a little more detail. The jobsite identification, the inspector makes sure that the jobsite is identified on the video display and then begins the inspection. Inspection results, you know, everybody wants to know the results so, you know, they're entered into the permit database as soon as the RVI is completed or, you know, as soon as the policy for the department allows. It may be that they're connected or it may not be. Maintaining records of inspections, so again, that's whatever state law or regulation or jurisdictional policy it is. So you just follow that.

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Same as for all records. Next.

So RVI scheduling, so you know, what are the AHJ requirements. They need to make sure that, you know, they have a required lead time that works within their department system. So that could be – typically it's one day, one business day, but there may be something – a reinspection or something, it could be actually done the same day. But again, that's totally up to the jurisdiction, but either way there needs to be some obvious lead time.

They need to establish sufficient time for the type of inspection. So the inspector, if it's gonna be a more complicated inspection, maybe frame, if they're doing frame inspections of let's say rough frame of a home, you know, you need to make sure that they leave that time, and what we'll hear, and then we'll hear from Valarie

later, you know, from the experience side, but this typically takes longer and it makes sense to do a virtual inspection –

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versus, you know, being onsite. But, of course, you save on the drive time.

Time slots, so it's good for a jurisdiction to post, you know, whatever available time slots there are so that when somebody is scheduling an inspection they can look at what's available and see what works within their personal schedule. The platform, you know, every jurisdiction, we're finding, you know, these different types, things that work for them and it's some of this FaceTime, Skype, Google Duo, you know, and there is many others, but it has to be something that the jurisdiction has available.

Confirm qualified inspection type, so we say that, we're talking about, you know, what the list of qualified inspections does the jurisdiction have. So do they do frame inspections? Do they do water heater replacements? Do they do more complicated buildings, high-rise? I mean what do they do?

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And they should have a list that's available to the contractor or customer to identify what qualifies and then they can set up their inspection per that qualified type.

And then provide confirmation to the customer. So once it is scheduled, once they have gone online or called or however your system is set up, they need to send a confirmation to the customer to let them know that it is scheduled for a certain time and to allow that proper time to complete the inspection. Next.

So from the customer side of scheduling, you know, they need to make sure, first, of course, that they have an active permit. You know, there's no reason to call and try to schedule an inspection without it, and of course that's not just RVI, that's for onsite inspection as well. But and they need to also know whatever the required lead time is.

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So if it's one day ahead they need to make sure they call that full business day ahead. If it can be the same day, you know, call in the

morning, get it the afternoon then they need to do that. And if it's longer than that too they need to know or make sure that they fall within that lead time.

And again, the customer needs to know what the inspection time is or expected inspection time is so that they allow sufficient time for the inspection. You know, you don't want to set up an inspection that takes 45 minutes and you set it up for 10:30 but you've got another meeting at 11:00. You just need to make sure that you allow the amount of time. You know, it could go faster, as we know, but you need to make sure that you have the full time available.

You need to confirm that you have the platform that's compatible with the jurisdiction. So whether – again, whether that's Facetime, Skype, Google Duo or whatever it is, you know, WebEx, it doesn't matter, you just need to make sure that you have that capability on your device, whether it's a phone, whether it's an –

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iPad or whatever that you're using for the inspection.

And again, you need to confirm the qualified inspection type. So whatever you're calling for, I mean you may have a project going that a number of inspections may be qualified as RVI but there may be some that aren't, some may be a little too complicated. And then again, you need to make sure you get that confirmation from the jurisdiction for the time so that there's no, you know, expecting a certain time and it not being confirmed and not being available, the inspector not being available.

And then there is – you know, we hear there is a lot where you sign a consent notice, so especially if it's not mandated, if it's a voluntary provision, so that, you know, you sign that you're willing and agreeing that the site is safe and that it's all voluntary and that you can do the video.

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You know, there's concerns with, especially in a home, if you're going through a home, you know, what is being videotaped? Are there some privacy issues that somebody is videotaping or videoing, showing on video that, you know, you don't want to see or you don't want to be seen. So make sure that the customer is aware and that they sign an agreement that, you know, that won't

happen. So next slide.

So for jobsite preparation, you know, you need to really ensure that the jobsite is safe for the person handling the device. That there is – you know, they may be looking up, the inspector may ask them to show something up in the rafters or trusses or whatever and they're walking around and, you know, you need to make sure that there isn't things laying on the ground that they could trip over and fall, hurt themselves, ladders, whatever the run into. So it's got to be safe, and again, that's one of the things you need to sign that consent –

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that you will make sure it's safe so no one gets injured during the process.

You have to make sure that if you're using a phone or a tablet or whatever that it's fully charged before you start the process. And because we all know batteries have different life times, lifespans, you know, you want to – it's really good to have a backup charger, a system that's fully charged that you can plug in or whatever to keep the device going 'cause you don't want it to die in the middle of an inspection, that can really disrupt things.

You need to make sure that you have high speed Wi-Fi or cell service with a strong signal. So that's, you know, a home may have Wi-Fi, no problem. Some jobsites might be difficult, so you're gonna be using cell service and you need to make sure it's at least 4G and, of course, 5G is on the way, so, and, you know, who knows what the future holds but you need to make sure that there's no problem with the signal.

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You need to make sure there's good lighting and everything is visible that needs to be inspected. You know, whether it's drywall, whether it's a frame, whether it's insulation, it doesn't matter what it is. You need to make sure that the inspector is able to see it and it's visible so that they can confirm that it meets code or the required installation process.

Tools available onsite, so there may be things where you need to measure. You know, is it six feet from the, you know, distance from here to there or is it two inches, whatever. Have things like a tape measure onsite. Maybe you need a ladder so that you can –

you know, an inspector needs to see something up high and get a closer view or a different angle, you can get up on the ladder, you know. So there's all types of things, tools, and we have a list of those in a brochure, but you know what would need to be –

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an inspector, I should say, would know what needs to be done and that should be posted on their website or what they have available.

Plans and permit cards should be available on the site, you know. Although they're not signing the permit card but still to have it there indicates that it's an active permit and no issues. Next.

So RVI process, again, customer prep, image quality is important. So when you're using your tablet or your phone you need to make sure the screen is clear and the camera lens is clear so there's no issues with quality. Because again, quality can cause a problem with the inspections. Turn off notifications to avoid interruptions. So, you know, if you're getting phone calls in the middle of an inspection, well, that can obviously kind of disrupt the whole video signal and pause it or whatever the case may be depending on the type of device.

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So that causes a distraction.

And you need to minimize your outside disruptions. So, you know, being a former contractor I know a lot of times you'll have people coming up and asking you, maybe either your employees or another subcontractor, whatever, you know, coming up and asking you questions about, hey, what do I do here or what's going on here, where are the plans, what's this, what's that. You need to make sure during that period of time that that doesn't happen, so that everybody is aware that, you know, you're doing an inspection and they need to wait for any type of question or needs.

Also background noise is just – also needs to be – could be a problem where if they've got saws or drills or other things going on in the background, even hammering can be a disruption to the inspector being able to hear, you know, what is – answering to questions or discussion or whatever the case may be. Because typically an inspector is going to be telling them, you know, what they find wrong or whatever –

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and they're trying to explain to them what the problem is.

And, of course, you need to be ready to receive the call on time. You know, and I'm not sure how all the departments are doing it. A lot of them will say, you know, be ready – they'll need to give a 10 minute, 15 minute window or some have an exact time. You know, be ready at that time, whatever it may be, whether it's in a window or whether it's that exact time. The customer needs to be ready to receive it. Next.

So – and again, the inspection process, again, you know, you need to begin it at the street for most cases, so you can see the address, lot number, whatever the case may be so that the inspector can identify the location. There is other systems that are out there with geotagging or GPS systems to help ensure that they're at the right location. And I mean this obviously could be accidental –

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or devious on the part of the customer, we don't know, but this way it ensures that your records, the jurisdiction's records are accurate and that you're at the right location and not inspecting a house that, you know, is next door to the one that is supposed to be inspected, so.

And it's important to follow the directions of the inspector. So, you know, if they need you to go to the left, look to the right, look up, whatever the case may be, whether it's to, you know, go upstairs, you know, multistoried building, you know, start there. And again, minimize interruptions, as I talked about earlier. So you need to really keep those down to a minimum. Next.

So inspection results. Results are entered into the system, again, following the inspection, whether it's immediately, whether their system actually allows them to enter it as they go or whether it's something they may enter in later but it needs to be done –

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and available for customer review. So a customer could go online, look at their record and see what was actually written. I mean a lot of it will be discussed, you know, but then you'll find more clarification possibly as what is written by the inspector and what is expected to be done. An inspector may send those results

electronically as well, and again, that depends on the jurisdiction.

And when there are corrections noted, you know, obviously you'll need to schedule a reinspection through the same process. Re-inspections have been something that's pretty common, I think. Most jurisdictions, I think, are allowing re-inspections for RVIs. So that could be done immediately, depending on what the corrections are. An inspector could say, all right, let's schedule it right now because, you know, they'll be done, you know, the next day or whatever, –

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to take a look at it or allow them to go on without it. The other option is that the inspector may permit video of corrections, so, or pictures, and some jurisdictions are actually allowing that. So especially if they're not a major health safety or energy compliance issue, you know, something small, you know, let them go ahead and do it, just say, hey, send a picture and that's good.

Utility tags, of course, are an issue because typically the inspector when they approve an electrical panel or a gas, they tag it in many jurisdictions, obviously don't know across the United States how that's done but in my experience it's always been we tag it, that gives the information to the utility that they can hook it up, and so the best way to do it now is to work directly with the utility company and so that you can have a system where you can send in what –

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buildings or addresses have been approved and what they are, whether it's electricity or gas. Next.

So what are some of the inspection types, and I apologize, I actually dropped this slide here that had more listed on there, but here are some. So, you know, residential and commercial, rough-in framing, plumbing, mechanical, reroofing, residential rooftop mounted photovoltaics panel systems, miscellaneous repair, water heaters, and anything that the inspector approved.

And I mean – on my other list, of course, I did have insulation. You know, I think when you come to energy, you know, from – it's pretty easy, I think, to check glazing, right. I mean you check the listing on the tag, and I think you could do the same with

mechanical equipment, water heaters. You know, they're pretty easy to display the tag to the –

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on the screen through the video to check your ratings on those to ensure that it meets the energy. So there's a lot of things that can be done.

And then, of course, any other inspection approved by the AHJ. So when I say that, that's because, you know, our discussion with jurisdictions across the country, there are some that have enjoyed this to the point that they're not gonna go back to doing the onsite inspections. They plan on doing everything through virtual. And then there are some that don't feel quite to that comfort level. So it's really up to whatever they feel.

You know, here are some examples. There's low hanging – what we call low hanging fruit, you know, you can grab these, they're pretty simple to do. And then some that are more complicated and complex, and Valarie can certainly will give her experience on that. Next slide.

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So what are some of the challenges, connectivity, technology, video and/or audio, which you can imagine that easily. Ensuring correct site locations that I talked about earlier. Ensuring correct location within the building. So you know, inspector needs to really know that if you're talking about the third floor of a three-story building that what they're inspecting is on that third floor. Or you're talking about mechanical equipment that maybe, you know, has – or a building that has three or four HVAC units, you know, to ensure that whatever you're looking at is the one that you're looking at – that you need to be looking at.

So insufficient data to demonstrate compliance, and this kinda could come into where, you know, they had to make a change onsite because maybe a beam didn't quite work with the design, maybe the roof comes down at an angle and they had, you know, they had to do something, a fix and get the engineer to approve it. So need that data available.

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Complexity of the project, of course, can be a challenge. Inadequate tools onsite, as I mentioned earlier, you gotta make sure those are there. And length of time for the inspection. Next slide.

So what are some of the successes or positives. You know, health and safety benefits, obviously, in times of COVID especially. You know, customer can schedule inspection time, so they're able to plan around the schedule. So a homeowner, and this is one of the things I've heard specifically, homeowners, you know, when you schedule – at least when I was an inspector, we would schedule, okay, we'll be there sometime in the morning or sometime in the afternoon. Another jurisdiction _____ _____ _____ said, hey, we'll be there sometime during the entire day.

But, so a homeowner would have to either take the entire day off or take the morning off or afternoon, whatever the case may be, and – if they're working and be there and be available. This allows them to schedule something, let's say, before work, 7:00 in the morning, maybe. They can do a water heater replacement or something of that nature –

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and cover it and then go on to work and be happy.

And a predetermined length of time for the inspection. So you know, contractors know that they can – if they've got something else to do, you know, they've got 45 minutes set aside for this, then they can move on to something else. They don't have to wait there all day or part of the day waiting for the inspector to show up.

It eliminates drive time. You know, again, my last job was Sutter County. I could – you could easily spend, if we were in South County and we could spend, you know, 35, 45 minutes one way to get to an inspection, turn around and come back. So all that drive time has been eliminated by use of RVI so it saves time and resources, right. Just think about that, you don't need your truck as often. And then, of course, if you're not driving you're reducing greenhouse gas emissions from that vehicle. So next.

So now, I've kind of given you that broad picture, but –

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you're gonna really hear something from personal experience in North Las Vegas and turn it over to Valarie. Valarie.

Valarie Evans: Hello, thank you very much, and thank you for allowing me to participate in this webinar. Let me see right quick. Okay, I'm Valarie Evans. You can move to the next slide. I'm Valarie Evans. I'm a North Las Vegas building official and I have created a remote inspection program for the city of North Las Vegas that started out prior to COVID-19 and we have utilized what we've learned before and during and after COVID or post-COVID stay at home order, I should say, to be able to determine the best methods for North Las Vegas to be able to continue with the remote inspection program. Next slide.

So I'm gonna talk about the purpose for us and the things that we'll go over about the purpose of –

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video inspection and how we set up our remote inspection program and how we implemented input from all of our staff in order to come up with the idea of what would work best for North Las Vegas. And then we'll talk about the process of inspection and how it shifted from one manner to another manner to what we do today. It's really interesting how things just continue to shift and grow and change as this whole process has been unfolded in front of us through the COVID-19 pandemic.

And then we'll talk about for us what the contractor needs and overcoming the tips and hurdles that we learned, the things that were difficult, like Dave said, the challenges when it comes to not only technology but comfortability and the way that we've learned to move forward from that and what we do today with remote inspection at North Las Vegas. Next slide.

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So before COVID-19, the city of North Las Vegas, back in July of 2019, we created a remote video inspection program, it was called the Residential Video Inspection Program and it allowed for these one and done type residential inspections to be done via a video. I can't claim the fame to it. I got it from another jurisdiction, I got it from the city of Tucson, and the building official down there helped me to see what Tucson was doing and I was just able to take it and make it work for North Las Vegas in the best manner. And so we started the program of Residential Video Inspection Program in July of 2019 and it started from there and it only got bigger since then. Next slide.

So, originally what we had to determine was how we were going to –

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set up the inspections and what we were gonna allow to be performed remotely and how that method of video was gonna be managed. You know, was it gonna be remote? At the time it was just remote Skype, and how were we going to utilize that, was it Skype for Business, was it just Skype? We had to determine what inspections that were gonna be scheduled and how they were gonna be scheduled. And then how they were gonna be performed. Really just learning from the beginning and moving forward.

And then we were gonna determine how we were gonna maintain our documentations, particularly after the COVID-19 stay at home order, and then how we were gonna archive and keep the reports and the QAA, specifically, the quality assurance reports, and those things that come with a project and how we were gonna validate those during the inspection process if we needed to. And then were we or were we not gonna archive the video. The city of North Las Vegas doesn't archive video at this time –

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and I'll explain why we don't at this time a little later on. Next slide.

So in the beginning the Residential Video Inspection Program was simple, it was these scopes. It was, you know, the rooftop solar, the aluminum patio cover, the water heaters, water softeners. Lots of times the contractor will get the permit and then they will go do the work, then they'll leave the permit with the homeowner and tell the homeowner they have 180 days to get the inspection. So the homeowner has now, for an example, the water heater, the homeowner would be home for them to change the water heater. They would get the permit card from the plumber, from the plumbing contractor, and then they would have to take another day off for the inspection of the water heater, being a pressure vessel. And then so they would potentially miss two days of work.

If they were rolled in their inspection or if something happened that day, they could miss more work. And so when we first started residential video, I asked my inspectors –

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or the whole entire inspection team what they felt would be good scopes of work to do the Residential Video Inspection Program and this is what we came up with. You know, the detached storage sheds not to exceed 600 square feet. That 600 square feet for the city of North Las Vegas is where the soils engineering report comes in. So locally we require geotechnical investigation for any projects that have foundations that exceed 600 square feet.

So just the spa waterlines, water softeners, and then the electric service changes. You know, Michelle mentioned that I'm an old electrician, I'm an old master electrician and I have a master electrician, as well, as one of my inspectors. And so when he said that he was comfortable doing electric service changes then I knew that my staff was more comfortable with doing remote inspection and they weren't being so resistant as to what they were gonna see or what they weren't gonna see. So next slide.

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So if a contractor had scheduled the inspection the same day that they did the work and say they went onto the software and they scheduled the inspection for Monday afternoon at noon and then they got to the project Monday morning at 8:00 AM and it took 'em four hours or three hours to do the job. Then they could hang out on the job, have lunch and then schedule the inspection, have it scheduled and do the remote inspection and be done in a day.

And then the customer wouldn't have to take any time off of work other than that one time and the contractor would only be out there one time. Because there was resistance with the industry about having to go back out to a job to perform an inspection remotely. And so really getting the industry onboard about doing it all in one day, schedule it the same day you're doing the work. You know how long it takes to do a specific scope, and then we'll be ready to do the remote inspection with you when you're done.

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So during this COVID stay at home order, we – the governor of the state of Nevada made a stay at home order in mid-March and during that time, the next day, during that night, I had like three or four inspectors call me and they were all concerned about their safety and coming into work and being around the community because we were not – we were considered essential, and the

governor had all nonessential activity stop.

So the next day I came in and I sent all my staff home, and so we were gonna do 100 percent of inspections remotely. We went from taking in paper plans to doing 100 percent electronic plan review in permitting, inspections, meetings, Go To Meetings. And so the bulk of my staff went home and just me and the pack manager stayed in the office to do the day to day business here at the city of North Las Vegas.

And so during that time, during that 12 weeks, we performed 11,500 inspections.

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We performed more than that but we performed all of the building inspections and all the fire inspections. And we would identify if there was inspections that people were concerned about or complex inspections that we wanted to take a closer look at or inspections where something might get covered up and we weren't comfortable, then I would go out myself or somebody would take the time to hold off until we looked at it a little bit closer.

And so for that 12 weeks, from March to June, we stayed 100 percent at home. We did allow some photos to be done when approved by us. It was interesting to see that when – with today's cameras and the quality of today's cameras, that a picture tells a thousand words and you could take a couple three or four pictures of a water heater installation and you can zoom in and really see everything that you need to see to validate that it's code compliant.

And so there were some cases where we had some connectivity issues, where a customer would go into –

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the garage and they would lose signal and then they would come out and they would get signal. And so we would just have them take a couple pictures and then we would utilize the photo remote aspect of it. And all my inspectors did it a little bit differently, like some of my inspectors would write down all their inspections in the day and then they would call them all and schedule, you know, the inspections as they came up. Other inspectors were – they would hold a harder line to a timeslot.

But overall what my inspectors would do or what the inspectors for

North Las Vegas would do is that they would work with our customers and work with the people out there to where if somebody wasn't ready for an inspection they would just reschedule it for later on in the day and come back to it. Or if somebody was on an inspection, on a video inspection and it was the time for the next inspection, they would just text that person and tell them that as soon as they got done they would take care of them.

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And so it really did work well but not perfection but we were making changes in real-time. Like things were changing as changes happened, and so it really was just jump in, be essential and keep the community moving forward. There was several homeowners that were waiting to get into their homes and several commercial tenants that were waiting to get into their buildings, so at the time when we were in the middle of the pandemic all of the documents would be e-mailed to my inspectors and then from there they would be validated during the inspection. Next slide.

And so before the COVID-19 stay at home order, like I said, it was like those one and done type inspections. It would take my inspector, you know, anywhere from 5 to 15 minutes to do an inspection and a lot of that meant going in the backyard, you know, rattling the gate and making sure there's no dogs running around the side yard to go look at an aluminum patio cover, you know.

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And ultimately, it would take more time, more drive time and customers being home, so in the beginning we created an account with Appointments Plus and we were able to allow the customer to schedule timeslots that we, ourselves, gave 20 minute timeslots. And so we scheduled timeslots of the inspectors to have in their calendar. And in the morning or when they got their inspections, all my inspectors would go to the Appointments Plus calendar and look at what their inspections were and then schedule their day from there. So it really did create no wasted time for inspectors, no wasted time for the homeowner and no wasted time for the contractors as well. Next slide.

And so just really quick. In the beginning you would go to the website, there would be a picture of a cell phone or a book now button, and it would take you to a calendar, a dropdown menu of the scopes, and then it would take you to some timeslots. It would

allow you to pick the time that you wanted to create your inspection. Next slide.

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From there you would put in a little bit of information and it would – you would put the permit number, you would finalize the appointment and you would get an e-mail from Appointments Plus that said, you know, you've scheduled an inspection, click here to cancel or reschedule. And so Appointments Plus really did work for North Las Vegas during the Residential Video Inspection Program and it allowed me to have very customized reports and numbers of, you know, I could schedule just electric inspections for Paul and just, you know, water heater inspections for Linda or however you want to customize this program. It is very, very flexible and user friendly to be able to make it work within the jurisdiction's needs. So that's what we did prior to COVID-19. Next slide.

So at that time what you would need, like Dave said, was a wireless device, smartphone or tablet, a minimum of 3G connectivity.

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We switched up once the COVID-19 pandemic started and we would allow any form of media that the customer had. If they wanted to use Skype they could use Skype. If they wanted to use FaceTime or Duo that would work for us. And so prior to the inspection time we just wanted to make sure that the customer was ready with all of the tools that they needed to perform the inspection and then they would interact with the inspector.

So there was some learning curve of an inspector not only learning technology, like Dave said, but also learning how to communicate with the contractors and the homeowners to where they would understand, you know, how to move through a jobsite slowly with their video and how to step back if they needed to and so that communication between the inspector and the industry and the homeowners really was escalated at this time. Next slide.

So I'll just go through this really quick. Before the COVID-19 we only used Skype. It was just regular Skype, it wasn't Skype for Business. And the inspection would start, –

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like Dave mentioned, it would – we would begin at the street and it'd show us the address. They would show us the permit and they would move like generally left to right or top to bottom and follow the directions of the inspector. And once we had that communication down – what we found was that, you know, the person that was doing the video inspection for the solar industry, you know, for A company, then A company would use the same person and he would go from job to job to job. And so really it was the same person that we were doing the video inspection with, and so we really got to learn that comfort.

And it was also like customer – or quality assurance, because when there was things that was wrong with the inspection and they had to fix it during the inspection, then the contractor would be able to go back to their shop and tell their shop the things that they needed to do to increase their quality assurance. Next slide.

And so like I said, during COVID-19 my inspectors did –

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it a little bit differently. They all kinda created their own little process where whatever worked for them worked for them. I didn't really give them a specific method because, you know, this inspector may not be so technologically advanced and this inspector, you know, would write stuff down but this inspector would – they would all keep track differently based on, you know, the relationships that we already have.

We do several single family residential subdivisions and a lot of commercial industrial work in North Las Vegas, and so, you know, we have those relationships with those contractors already and those developers already. And so you know, lots of times they just call my inspectors as it is and they really communicate back and forth, so for what works best for everybody.

And so the inspector would work through their process and schedule the inspection, and then like Dave said, they would input it into the inspection software, permitting software that we have in North Las Vegas. Next slide.

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So what we learned during that was, you know, having that communication and contact is imperative. If somebody schedules

an inspection and they don't leave their contact information then we can't call them and get them connected at the right them, then sometimes their inspections wouldn't be done. The utility reconnections, we do a tagless electrical and gas tag program, and so we never put tags on, except we did for those down and out, you know, the disconnect, reconnects, those emergencies that we do. And so we had to have some communication with the local utility companies so that they would know that something was prepared and ready for reconnection. And so we worked through that hurdle, so to speak.

Getting the contractors to think like an inspector was something that was different because we go into a jobsite and we look at a lot of different things. We're going to do an all rough in a frame, we don't just go in and start looking at electrical.

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As we walk in, we're looking – I mean from the second we get out of our cars, you know, we're looking at the jobsite as a whole and we're looking at it like as discipline as a whole and not just a single discipline. So when you're walking with a framer or you're walking with an electrician, you know, we're walking that job looking at everything 'cause we're seeing things that they might have missed before or that we might have missed before or that needs to be taken care of before the next inspection. And so just really working together to have that communication was imperative.

And then how to make changes as things continued to occur was really important. You know, we did filter all of our inspections to Appointments Plus. There are other schedule software platforms today. There is a lot of inspection platforms that are jumping up and I know that ICC has partnered with some. And I've had other people communicate with me that have new inspection platforms where, you know, they can do specific GIS location and archiving of video and markup, you know, of the video.

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And so there is a lot of stuff that's going on that's really bringing this into the future and that's really impressive when it comes to remote video inspection. Next slide.

And so when we came back from the COVID-19 we wanted to increase the program to allow for more inspections via video, and so we got together as a team and we talked about what are the

things that they needed – that we could increase to that so that the change would be simple. You can run through the next slides because they're really just the inspections that we increased.

So we added in some residential scopes from our original scope of inspections and so we included residential swimming pools and gazebos. You can move forward. And then we also added in single family subdivisions that helped out the Southern Nevada Homebuilders Industry and the subdivision builders – go ahead.

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And we added in those commercial tracts or projects that we thought were simple enough that could be done via video. Next slide. As well as we did some fire stuff and we added in some tenant improvements of B and M. Those small tenant improvements, the – you know, the mechanical, electrical, plumbing, framing that we were okay with doing those. Next slide.

And we also included fire, so we also did fire, so today we continue to do the hydrostatic test starts with fire. You can go on to the next slide. And med gas and those other tenant improvements. Currently I have an inspector that sits at home and he does about 300 inspections a week, 280 to 300 inspections a week. He does them all remote. So I have one inspector that does that. We have just got a remote inspector that's actually gonna live out of Nevada that's gonna do remote inspections for us, and so that's gonna increase this even more.

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I really don't think that there is something that you can't do remote inspection for, as long as you're – the criticalness of the inspection equals the technology that you're using for the inspection. There is just so much technology out there. Go ahead, Ian.

And so I know that there is like no pain in change itself, there's only pain in resistance to change, so as we continue to change I think this is gonna continue to be something that people continue to use and that just elevates the industry. I think it's important to note that if you needed something specialized and you need a specialized set of eyes on something, you now have at your fingertips the entire world of specialization that can be used to help you get your way through a remote inspection. Thank you.

Ian Blanding: Great, thanks, Valarie. So I think now we'll turn things over to Michelle just to do the Q&A.

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Michelle Britt: So thank you, Valarie. That's the second time I've heard your presentation and every time I learn something more. I don't see questions here sent. Ian, do you have some? I'm hoping that there was so much great information there, if people have questions they have a moment to jot it into the chat or the question box and we'll try to get that out to Valarie and Dave to respond to.

Ian Blanding: Yep, we do have questions. So you're not seeing the question box?

Michelle Britt: I am not seeing the questions.

Ian Blanding: Okay, not a problem. So I'll just start with questions. So first question, is it recommended that the virtual inspection be recorded or is it best to just visually make the inspection without a permanent recording? So I guess that's for either Valarie or Dave.

Valarie Evans: I think Dave and I will probably have both sides of this coin. But in my perspective, a video is no different than somebody asking me about –

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an inspection that I did ten years ago, and so at this time we're not archiving it but I can see the value of archiving it.

Ian Blanding: Oh, Dave, I think you're muted.

David Walls: Got it. Yeah, no, I don't disagree. I think there are jurisdictions that are recording it. I think there is – _____ _____ _____ they're requiring customers to not record the video as well. So I mean there's two sides to that, right. Whether the contractor or customer records it and keeps it, and some don't want that. So – but as far as archiving, yeah, it doesn't make a lot of sense.

Ian Blanding: Okay. Another question here. Does RVI open inspections up to fraudulent or kind of, I guess, this person says drive-by inspections where projects are more subject to rubberstamping by third party inspectors?

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David Walls: Yeah, that's an interesting question. Does it open it up more, I don't know. Valarie has more experience at that than I do. Is it always a potential? I mean there's always the potential for fraud whether it's onsite inspection or whether it's video inspections. So I think it really just kind of varies. And again, it's a matter of comfort level and if – one of the things we used to learn is which contractors you can trust and which you can't. I know Valarie talked about relationships and you do really build those relationships with contractors.

And so you're always more careful with those you know you can't trust and you're a little less so than the ones you can trust, but Valarie, your thoughts on that?

Valarie Evans: Well, I think that we did – we have had some people try to hide stuff, but you're right, Dave, it happens in real life inspections as well, –

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in-person inspections. Somebody could try to get over or get around the inspection process, and I think that really is about relationships and attention to detail. When we're looking at something – and if somebody is gonna hide something from you, they can really go to some elaborate lengths to do it. So trying not to go look at what's the worst in the process and really look at what's best and work on those relationships really did work for us.

David Walls: And I think you and I could both give plenty of examples of those – of how people tried to get around, yeah.

Ian Blanding: Great. Another question. Is there a published list of software that is designed to assist with the process of virtual inspections? So I know you guys mentioned Skype and, you know, Google Duo and other things but I don't know if this person may be thinking of maybe consultancies that also have some technology available.

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Valarie Evans: I have been approached by several organizations that have software that's directed towards specifically to video inspection. I know that ICC has partnered with an organization that offers video inspection as well as other organizations that ranges from archiving the video to GIS location to marking up a video as you go and archiving it later. So there are platforms out there that have value. At this point, at this time right now, we just move at such a

fast speed that we just don't have time to implement anything new right now.

David Walls: Yeah, and I don't think we have a comprehensive list. I mean we have some but, you know, we don't have a comprehensive list of what's out there, because as Valarie said, they're popping up all the time. It's obviously becoming a new industry or a growing industry, so.

Ian Blanding: Sure. Question that just came in which I think is an interesting one. Do cities need to approve RVI –

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or can a third party service offer RVI kind of, you know, when they're doing inspections for a city?

Valarie Evans: No, the city would have to approve it if they were doing inspections for the city.

David Walls: Yeah. Yeah, if it's a third party it would have to be approved by the city. In fact, typically they're hired by the city. If you're talking special inspections that's a different story. But third party inspectors typically work for the city, in my experience anyways, in terms of if they're overloaded with work, they farm it out to third party. And I don't see why RVI couldn't also be used by those third parties if they're approved by the city.

Ian Blanding: So this is kind of future looking but is anyone using drones for some of these inspections or Valarie, do you have any intent on using drones in North Las Vegas?

Valarie Evans: You know, I think drones, holistically within a jurisdiction –

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is an amazing idea and an application where it could be used in several departments to GIS specific locations of city owned facilities as well as emergency response and management, and as well as remote inspections where maybe you couldn't get to the inspection or you needed more access to it. Definitely there is several – any method of remote being not specifically right there is definitely good to look at in that. But I think drones is definitely something that a city could use holistically.

David Walls: And ASTM has an actual standard for use of drones. I think part of the problem in talking with some jurisdictions is that the FAA has restrictions that make it sometimes difficult to use drones in certain areas. But I can tell you, I'm also working with a city in Saudi Arabia right now and they want to use not only drones but they want to use robots that go inside the –

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building itself and do remote inspections. So we're just beginning that process. We'll see how that all works out.

Ian Blanding: Interesting. That's great, and thank you all for your time. It looks like we are at our timeslot, but I wanted to go back to our list to plug our future webinars but – here it is. So just looking ahead, we'd love to have you back for the next series of webinars. So our next one is next Thursday, What's New in ASHRAE Standard 90.1, and then talking about the 2021 IECC Residential Code following that. So you know, hopefully you can continue to tune in, 1:00 PM Eastern Time on Thursday.

And so thanks again to all of our speakers and moderators. Great information. This webinar will be – is recorded and it will be available within about a week.

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David Walls: Thank you.

Valarie Evans: Thank you.

Ian Blanding: Okay, so thanks everybody.

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