

An Interview with Dennis Crnjak, Founder of Nova Advanced Imaging Inc.

Concrete inspection - How digital X-raying is transforming the industry

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x-ray

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The High Stakes of Concrete Inspection

In the fast-paced world of construction, precision is everything. A mistake such as accidentally severing a post-tension cable or electrical conduit can cause significant project delays, costly repairs, and even safety hazards. Engineers and contractors rely on imaging technology to identify embedded elements before drilling, cutting, or coring to avoid such risks.

Ground-penetrating radar (GPR) and film-based X-rays have been the go-to inspection methods for years. However, each had critical limitations: GPR required skilled interpretation and was prone to misreading, while film-based X-rays were slow and involved radiation safety concerns. Digital X-raying is revolutionizing the industry, providing instant, high-resolution images with superior accuracy.

Nova Advanced Imaging Inc., led by industry pioneer Dennis Crnjak, has been at the forefront of this transformation.

From Uncertainty to Clarity: The Digital X-Raying Advantage

Historically, concrete imaging relied on either:

- **GPR**, which is cost-effective but highly dependent on technician interpretation, often leads to errors in dense concrete structures.
- **Film-based X-rays** with isotopes provide precise images but have long exposure times, radiation risks, and chemical processing requirements.

Digital X-raying eliminates these shortcomings by offering immediate, high-resolution images without needing technician interpretation. Engineers can now verify embedded objects like wires, rebar thickness, and post-tension cables with certainty—something previously impossible with GPR. "I tell clients, you get what you pay for," says Crnjak. "Nova deploys both technologies to job sites, but X-rays provide unmatched clarity, while GPR helps engineers determine depth."



Dennis Crnjak & Steve Malenica - founders of Nova Advanced Imaging Inc.

A Game-Changer for the Industry

Crnjak's journey into digital concrete inspection began in 2008 when he transitioned from the wood industry to concrete cutting. Frustrated by the limitations of isotopes and film-based X-rays, he saw an opportunity to modernize the process. In 2014, he co-founded Nova Advanced Imaging Inc. with Steve Malenica to make digital X-rays the industry standard.

From 2014 to 2018, Nova could only inspect up to 9 inches of concrete using a pulsed X-ray source. Meanwhile, traditional iridium isotopes could penetrate 14 inches, driving Nova to seek a more powerful solution. 2017, at an ASNT conference, Crnjak discovered the Comet Evo 300D constant potential source, a breakthrough that allowed Nova to match and eventually surpass isotope-based imaging.

"Digital X-raying proved to be a faster and more efficient alternative to film-based inspection," Crnjak explains. "It marked a turning point for the industry."

How Nova is Pushing the Limits of Digital X-Raying

Nova has continuously invested in cutting-edge technology to increase efficiency on construction sites.

- **Shorter exposure times** – A 12-inch slab that once required two minutes of exposure with a 900-watt system can now be scanned in one minute or less using the EVO 300D/1200.
- **Increased shooting distance** – A wider range of up to eight feet (2.5 meters) streamlines setup, reducing on-site downtime.
- **Eliminating costly reshoots** – Unlike film-based X-rays, where technicians must wait for image development (and risk discovering unusable images too late), digital X-rays allow immediate retakes, preventing expensive return visits.

"Cutting exposure times from two minutes to one may seem minor, but in a fast-paced construction environment, it makes a massive difference," says Crnjak. "The 1200-watt system would be my first choice."

Rethinking the Inspection Process

At Nova, we're redefining how concrete imaging is done. Our process begins with integrating Hilti Transpointers to accurately determine concrete thickness before scanning—an essential step to ensure precision.



Nova technician using Hilti transpointer to locate core hole location on underside of slab.



Comet X-ray EVO 300D setup at approximately 30" from underside of the slab.



Oakridge shopping mall project for Ellisdon. X-raying for window installation pinning to avoid post-tension cables.



The Comet X-ray EVO 300D setup on SuperHoist - ready to shoot.



Beautiful Vancouver with a view of downtown and the North Shore mountains.



Detail slab analysis using both GPR scanning and digital X-ray.

Once locations are identified, we align the X-ray source using a laser for pinpoint accuracy.

Digital X-ray requires a higher degree of setup and precision than GPR, but that same precision enables superior imaging accuracy and reliability.

The advantages go well beyond image clarity. Traditional isotope and film-based systems can require up to 30 minutes for image capture, followed by additional time for film development—significantly slowing down the inspection process. In contrast, our digital X-ray technology delivers instant results, enabling contractors and engineers to make real-time decisions, minimize downtime, and keep projects on schedule.

"While film was once the industry standard, digital X-rays have significantly accelerated the inspection process," says Crnjak. "They allow for faster decision-making, secure image archiving, and a more efficient workflow - making Nova the clear choice for today's complex projects."

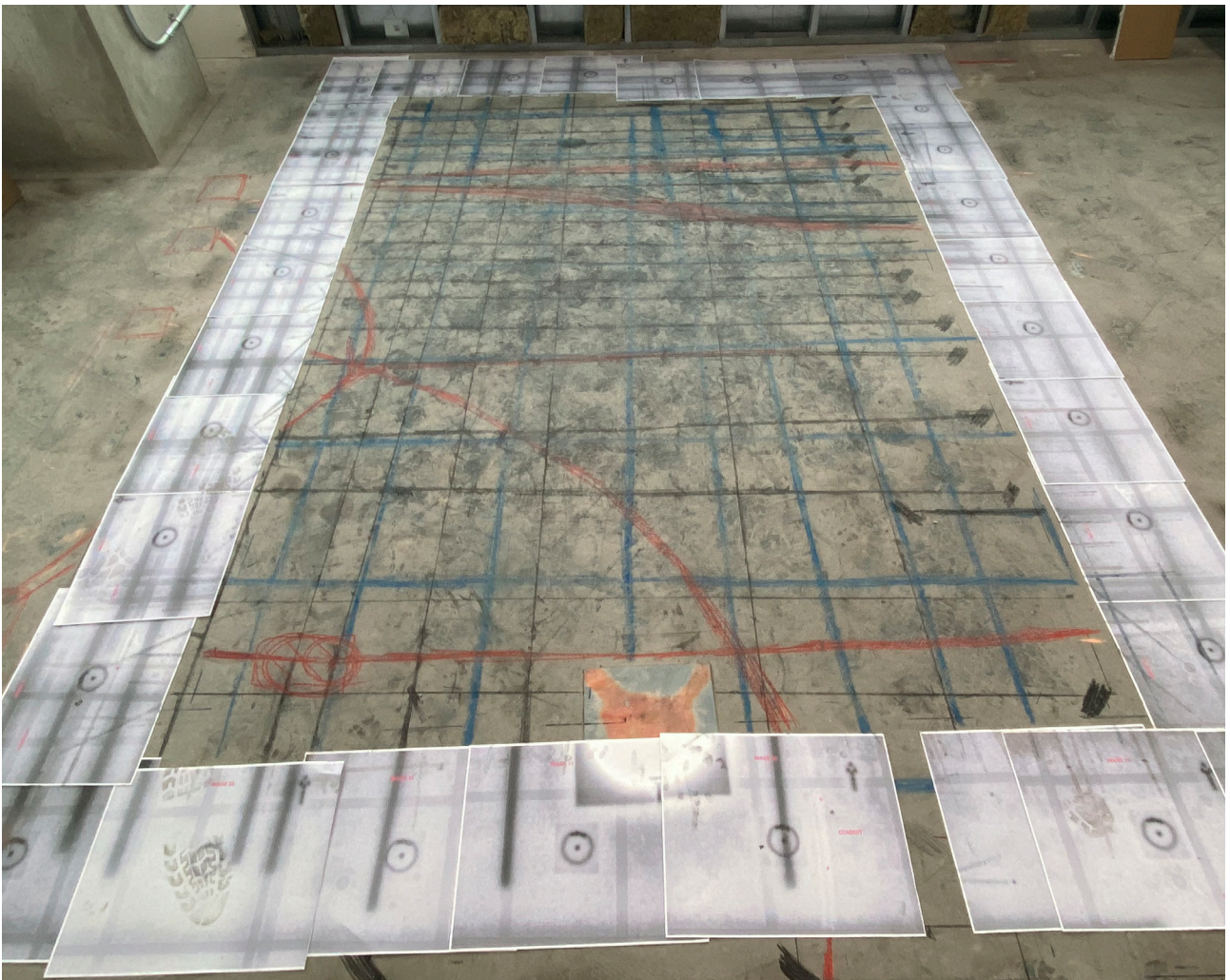
Final thoughts

Concrete inspection is no longer a guessing game. Thanks to digital X-ray, engineers, and contractors can make confident, data-driven decisions in real-time, avoiding costly mistakes and ensuring project safety. With shorter exposure times, instant imaging, and enhanced precision, Nova Advanced Imaging Inc. is setting a new benchmark for the industry.

As construction technology evolves, one thing is clear: digital X-ray isn't just an upgrade - it's the future.

"At Nova we provide contractors and engineers with the most visually reliable method of inspecting concrete structures. "

Dennis Crnjak, Founder of Nova Advanced Imaging Inc.



Detail slab analysis using both GPR scanning and digital X-raying.

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