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“Smart Construction – Increasing Opportunities for Small Business and Infrastructure”
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Good morning, Chairman Golden and Ranking Member Stauber.

My name is Ryan Forrestel, and I am President of Cold Spring Construction in Akron, NY. I am proud to sit before the Small Business Committee today to talk about how digital construction technology has benefitted our industry, and to talk specifically about the benefits that our small business has realized as a result of integrating these technologies.

Cold Spring Construction was founded by my great grandfather in 1911, and my father was President of Cold Spring before me. Our work entails just about every aspect of heavy highway construction – from heavy earth moving, to blacktop paving, concrete paving and bridge work.

Cold Spring Construction is a small business, with about 120 employees. And we are also a family business. I take great pride in continuing a family business that’s been around for four generations. But when we talk family, we don’t mean just blood relationships. Our employees are part of the family – we’ve got a lot of husbands and wives, sons and daughters that we treat as part of the Cold Spring family.

Cold Spring is proud of the high-quality work that we have performed throughout New York State, with many signature projects finishing ahead of schedule and within budget. Some recent examples of these projects include Rehabilitation of the Buffalo Skyway, I-390/I-490 Interchange in Rochester, Route 219 Expressway Extension in Springville and I-86/I-99 Interchange in Painted Post. We look forward to continuing to perform exceptional work well into the future.

The Digital Transformation of Cold Spring Construction

When my great grandfather founded Cold Spring back in 1911, all of the dirt was loaded by hand, and site measurements were done with an eye level. One worker with a pick and shovel can move ten cubic yards of dirt in a day – that’s the production that my great grandfather strove for. Ten yards in ten hours.

As the business changed and we started to integrate heavy machinery, it became possible to move thousands of cubic yards of material in a shift versus tens of yards.

When Cold Springs first got involved in automation, our main focus was to increase efficiency and productivity in earth moving operations. The thousands of yards began to approach ten thousand cubic yards per shift, with the same crew size. In grading of earthwork, the gains have been even more significant. Before the advent of machine guidance and automation, a five-person finegrade crew could grade about 1000 feet of expressway, to prepare for paving, in a day. Now, utilizing automation, a three-person crew can grade over 5000 feet of the same roadway in a shift. That is an improvement of over 500% when accounting for labor.

Today, Cold Spring Construction is using software that enables us to utilize digital models. We've always gone out to the job site during the bidding process so that we can view the site conditions and plan how to build the job. The software now enables us to go out and actually view the design which will be constructed and see that design overlaid on the actual site conditions in real time. The ability to actually visualize what is going to be constructed before it happens is an enormous advantage. It's expensive to find a conflict and then go back and make that change. This technology allows us to look at the design before any work is done. We most recently utilized this technology on the I-390/I-490 Interchange project in Rochester, allowing us to further optimize earthwork preparation and planning.

Benefits of the Digital Transformation for Small Business

Cold Spring Construction is a small family owned business, and integrating these technologies was a big investment initially. But the investment in these technologies pays for itself quickly. With full time use of these technologies, most will pay for themselves within the first year.

In a competitive contracting environment, these precision technologies are critically important to our business because they help enable Cold Spring to remain competitive against bigger contractors. Automation helps us to deliver optimally on every aspect of projects, to produce accurate, high-quality work the first time, to get our jobs done on time, and to get our jobs done on budget.

The benefits of these technologies include:

1. ***Efficiency and Productivity.*** Our main focus when we first got into automation was to increase efficiency and productivity in earth moving operations. Technology has allowed us to complete a greater volume of work with the same resources. Embracing technology at the front end, allows us to be as competitive as possible while overseeing more work activity with the same management. Technology also helps us to gather and organize information with fewer man hours invested, enabling increased efficiency in terms of both production and cost.
2. ***Accuracy.*** Modeling allows you to trust that a project will be built exactly as planned, and automated technologies enable increased accuracy as a result of having access to the most up to date job design files in real time. While accuracy used to be ensured by a four-person survey crew, now the same tasks can be performed by a single person, in less time.
3. ***Access to information.*** When it comes to things like document tracking and tracking RFI's, the biggest value of everybody having access to information from anywhere, at any time, is avoiding mistakes caused when somebody doesn't have that information in the field. The costs can be astronomical. Digital construction management systems create transparency and visibility for everyone who is involved in a project, and help to avoid these types of costly mistakes.
4. ***Anticipating and avoiding problems.*** One of the biggest cost drivers in construction is rework – it costs time, manpower, and materials. Using automation and a digital model gives us constant data flow which allows us to ensure that the project is being built exactly as it was designed. We are able to anticipate problems and avoid them. And when we do run into an issue, the 3D model allows us to immediately begin working in another area while the problem is worked out. So we don't lose time and money with downtime for machinery and manpower. For our business, this is probably what I see as the greatest benefit of the technology.

5. **Safety.** Safety is one of the greatest unexpected benefits that Cold Spring has realized from the integration of automated technology. Automation has reduced the number of workers who are on the ground (and potentially out of the sight of the drivers) around these big pieces of heavy machinery. We don't have grade checkers on the ground around machines like we used to. We are also able to perform work at night without the safety risk of having workers on the ground checking grade and directing the heavy machinery in low visibility conditions.

Challenges Facing Small Businesses Implementing Technology

There is a perception that the greatest challenge facing small businesses that want to integrate digital construction technologies is the cost. While it's true that automation is a big investment, the benefits of the technology are so immense that the technologies can pay for themselves in a very short amount of time. Automation technology is also very scalable – efficiency and productivity gains can be made quickly with a relatively modest initial investment.

The greater challenge facing small businesses that choose to invest in these technologies is the slow rate of adoption of these technologies across the construction industry as a whole. Cold Spring is working with some of the most advanced equipment in the industry. Maximizing the benefits of our equipment means that all of the owners, operators, and managers involved in a project need to understand the potential of the equipment.

Let me offer you an example. Cold Spring was selected as a contractor for three year I-90 construction project. In order to manage the size and complexity of the project, Cold Spring invested in technology that would allow us to meet deadlines and produce the best pavement. We used to perform concrete paving work by guiding the paver off of two strings, that needed to be meticulously placed and aligned by a survey crew. On this project we used 3D stringless technology, allowing the paver to be guided wirelessly, with survey instruments utilizing the 3D model for the roadway directly. Collaboration on a project of this size and scope means that a variety of companies had to come together to pre-plan the project and troubleshoot throughout the project. We ran into some interface issues with this state-of-the-art technology, but we were able to overcome by everyone understanding that we were in uncharted territory, with potentially enormous benefits, and all working together to resolve the challenges. This technology has become part of standard procedure for Cold Spring.

Like any other change, the adoption of these technologies has been met with some resistance. In some cases, it is because of lack of familiarity and agencies failing to adjust specifications to allow for its use. In other cases, it has just been resistance to new methods. We have even seen some of that within Cold Spring. When we first began implementing automation technology, we had employees who thought it would never work as well as what we had always done. Now, we don't have any employees wouldn't be up in arms if they didn't have the technology available.

Broader adoption of technology across the industry and increased understanding of technology by state and federal agencies would reduce these interface issues. Cold Spring supports the creation of the Accelerated Implementation of Advanced Digital Construction Management Systems in Section 3005 of S 2302, the American Transportation Infrastructure Act. This provision would provide \$20 million per year from FY21 through FY25 to increase state and local use of digital construction management systems, practices, performance and benefits. The program would support technology adoption that would enables State and local governments to integrate the adoption of digital management systems

and technologies in contracts; weigh the cost of digitization and technology in setting project budgets; advance training and workforce development to build the capabilities of project managers; better manage projects; measure and reward technology adoption across projects. The program would also allow states and localities to update regulations to allow project sponsors and contractors to report data in digital formats and fully capture the efficiencies and benefits of the technology.

Education and training are huge issues when we start projects with advanced technologies and equipment. Providing funding to increase the understanding of state and local governments will support our efforts to ensure that the equipment is incorporated into the planning phase, that the benefits of the technology are factored into bidding opportunities, and that we are able to take full advantage of all of the efficiencies and benefits of our investments.

Conclusion:

When my father and grandfather first got involved in this business, they never would have dreamt of the capabilities of digital construction technologies. What they did know was the key to our success: continuing to embrace our philosophy in terms of how hard we work, and how we treat our people. I believe that we need to embrace technology in order to advance these things that we've historically been good at and live up to those keys to success.

Every decision that we make as a small business is about doing the best work that we can do. Leveraging digital construction technologies has enabled Cold Spring Construction to do a better job of delivering good quality projects on time and on budget. That means getting more work, keeping more people working and providing a good living for these people.