

## OVERVIEW

It is a tale as old as time: A utility construction crew completes the work for which a utility owner hired it, but the utility owner disagrees on the amount of work completed and the quality of the craftsmanship. In many cases, payment is made based on a quality standard or construction milestone. Defining and agreeing on what the measurable outcome milestones in the construction process are is vital to completing work on time and with the expected quality.

## What Can Go Wrong Does Go Wrong

So much can go wrong during the construction design and assembly process. Parts and assemblies getting installed incorrectly can happen for several reasons:

- Parts that are out-of-sequence, backwards, upside down, or the wrong location are common occurrences.
- Wrong parts are installed—color, size or models are all potential targets.
- Parts were missed and not installed.

## Poor Quality is an Outcome of Misaligned Processes

Ultimately, the root cause of construction errors can be traced back to poor coordination by project participants, including engineers, project managers, construction workers, and customers or owners. These issues have real financial impacts, including:

1

Assets installed don't perform as expected because of quality issues.

2

Assets can take longer to be installed and don't generate the expected returns.

3

Assets with quality issues cost more to construct.



Utilities have responded by implementing tools to improve processes and adherence, but also adding personnel to inspect the quality of the work.

# Inspectors Can't Be Everywhere. Finding Issues Early is Key

Assessing the amount of work completed and the quality of that work is left to inspectors and self-reported by contractors. Inspectors are very good at what they do, but they can't be everywhere, and they do miss issues during the construction process due to human error. Finding construction quality issues earlier in the build process makes it easier for them to be fixed, mitigated and corrected. This creates a more efficient construction site, and better communication between the workers and project managers.

The screenshot displays a software interface for managing construction quality issues. On the left, there is a form titled "Construction Quality Issues" with fields for Title ("Angle brace fitup"), Location ("TT-SP-345"), Date of Event ("07/02/2021"), and Status ("Open"). Below this is a section for "Construction Quality Issue Observed" and "Action Taken" (TBD). On the right, a table shows a list of issues with columns for Title, Record Number, Current Step, and BP Setup Used. Below the table is a "Workflow Progress - Graphic" diagram showing a process flow from Creation to Response, Approval, Revision, and End, with various transition labels like "Send for Response" and "Approve Quality Observation".

# People, Processes and Technology Intelligence Can Result in Good Quality Outcomes

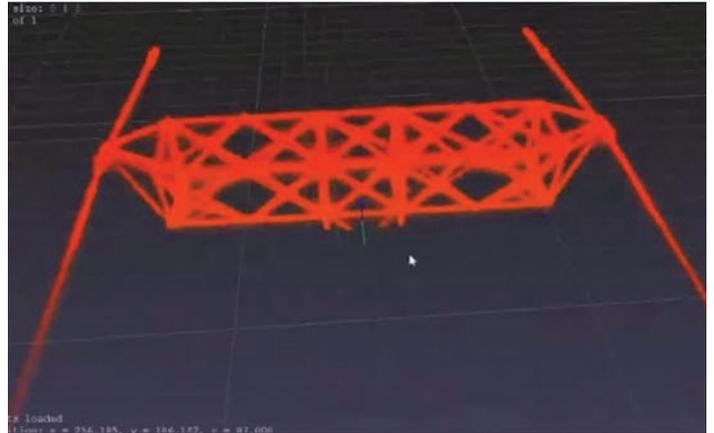
Utilities often overlook the impact of technology and how it can make their companies that much more successful. Technology can provide a critical link between all participants in the construction supply chain. Coordinating documents, materials, and labor to ensure that tasks will be completed and errors are avoided is an incredibly complex and difficult task. Augmenting this process with artificial intelligence enables utilities to find issues earlier and avoid costly reworks after the fact.



# Artificial Intelligence Job Site Modelling and Monitoring

Artificial intelligence can be used to augment the work done by inspectors and workers to ensure quality in the construction process. For instance, using an existing 3D CAD model, CobraVision can develop an artificial intelligence model that can be leveraged to monitor the construction site. LiDAR (remote sensing method used to detect objects) or other visual methods scan an existing job site to create a 3D representation of progress to-date.

The CobraVision AI model will then assess the amount of work completed, helping eliminate the guesswork and ambiguity of what's been completed. This can ultimately tie contactor progress payments to work completed and better align the owner and contractor(s).



## Proof of Concept: A Real-Life Example



**Problem:** A public utility company that is an existing customer using CobraVision has hundreds of lattice towers it purchased over the years, for which there are no drawings or other design criteria whatsoever. When they need to demolish these towers to replace them with new poles, the lack of drawings hinders the process of removing them. This can lead to issues such as employing the use of an improperly sized crane, costing hundreds of thousands of dollars more than needed if the crane had been correctly sized based on better information. Additionally, the lack of tower weight information could cause instability during the lift, resulting in unplanned motion or collision with adjacent assets, or in the worst case, it could result in an uncontrolled collapse. Not a good situation to be in. What's a company to do?

**Solution:** To address this, engineers could climb each tower, hand measure each one individually, make weight estimates and add 10-20% for hardware, but this could be inaccurate, time-consuming, and REALLY dangerous! There is a better way to ensure these lattice towers are deconstructed safely and cost efficiently.

This is a situation that calls for special powers (i.e., specially trained machine learning algorithms). The utility in this story reached out to CobraVision, which scanned each tower with high-density LiDAR and used machine learning algorithms to model the structure and produce an accurate volume and weight, which was used to design



2021 Copyright CobraVision. All rights reserved. Screen Shot Credit: Oracle

[www.cobravision.ai](http://www.cobravision.ai)

email: [info@cobravision.ai](mailto:info@cobravision.ai)

1984 Isaac Newton Square W, Suite 206  
Reston, VA 20190

the crane or helicopter lifts to bring the tower down safely. Additionally, various scenarios of cut lines were used to optimize crane rentals and each lift plan. This was faster, less expensive, and MUCH safer. Whew—glad we were able to figure that out.

But wait, what about cases where the utility wants to keep the tower and reconductor the line, or add additional lines? With the same special powers, this data can be repurposed to perform an otherwise time-consuming structural analysis in seconds, to determine if the tower can support the additional loads— faster, cheaper, and MUCH safer. Disaster averted again. Stay tuned to see how CobraVision uses its special powers to address the next utility construction challenge...



- Eliminates the guesswork and ambiguity of what's been completed.
- The contractor and owner agree on a standard for progress payments.
- Reduces the need for manual inspections.
- Identifies construction quality issues early in the process when they can be fixed easier and with less cost.
- Improves the overall quality of the build.
- Ensures assets are performing as intended.

## The Key Outcomes of AI Deployment:



Artificial intelligence is used to identify incidents across a broad range of quality issues.



The process, enabled with technology, coordinates the construction supply chain across functional disciplines.



Good quality control leads to safe work practices.

## What is CobraVision™?

**CobraVision™** is our AI platform that is trained to interpret and understand the safety, inspection, and construction quality needs of asset-intensive industries. From scanning live videos and stationary worksite cameras, to analyzing live drone footage, **CobraVision™** identifies, classifies, and reacts to these streaming videos—ultimately providing you with real-time knowledge of fixed assets, safety, and construction practices, which improves the efficiency of your projects and operations.

## Why CobraVision™ For Utility Construction Projects?

The focus of **CobraVision™** is to ensure the safety of all participants involved in your construction project. Our team members have found that with our vast experience working with construction companies, there are several hazardous conditions in construction sites that can easily be avoided. Construction sites are inherently dangerous; according to OSHA, the leading causes of private sector deaths in the construction industry are falls from faulty equipment, being struck by an object, and getting stuck in a faulty or dangerous spot at the construction site.

## Be Proactive and Avoid the Unthinkable

**CobraVision™** can prevent these accidental and heartbreaking but avoidable accidents from happening with real-time cameras and drones that funnel footage back to the managers of the construction site; every single detail is analyzed by **CobraVision™**. Whether it is the lack of a hard hat or a faulty step, our software gives managers insights into how to improve and identify a safety violation. Furthermore, **CobraVision™** provides a step-by-step process on how exactly to take immediate action with the vast amounts of data collected and continues to improve its algorithms to create even better outcomes for all participants involved.



## Partner with CobraVision™

Artificial intelligence is going to be the cornerstone of the next wave of innovation in construction, inspection and safety. **CobraVision™** is at the forefront of establishing an intelligent foundation to work with clients to collaboratively develop use-cases that bring real world value to your business. Together, we can use AI to make your business come alive.



2021 Copyright CobraVision. All rights reserved. Screen Shot Credit: Oracle

[www.cobravision.ai](http://www.cobravision.ai)

email: [info@cobravision.ai](mailto:info@cobravision.ai)

1984 Isaac Newton Square W, Suite 206  
Reston, VA 20190