



Drone Technology in Condition Assessments

A game-changing way to find and address structural failures

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Remote operated vehicles (ROVs), commonly referred to as drones, are proving to be an invaluable new tool for condition assessments, bringing more scope and detail to the reporting than ever before. While condition assessments have always been the most effective way to evaluate a building's physical condition, ROV technology has changed the game by giving access to once inaccessible spaces, enhancing imaging and generating a more comprehensive analysis compared to traditional building assessments.

"Condition assessments are critical to all restoration projects because the findings from these reports allow building owners to be proactive about existing or potential problems before they become costly or catastrophic failures," says Daniel Bilyk, Project Engineer at RJC Engineers' Edmonton office. "The addition of drones has enhanced our reporting capabilities and enabled us to capture a more complete picture of the building or facility."

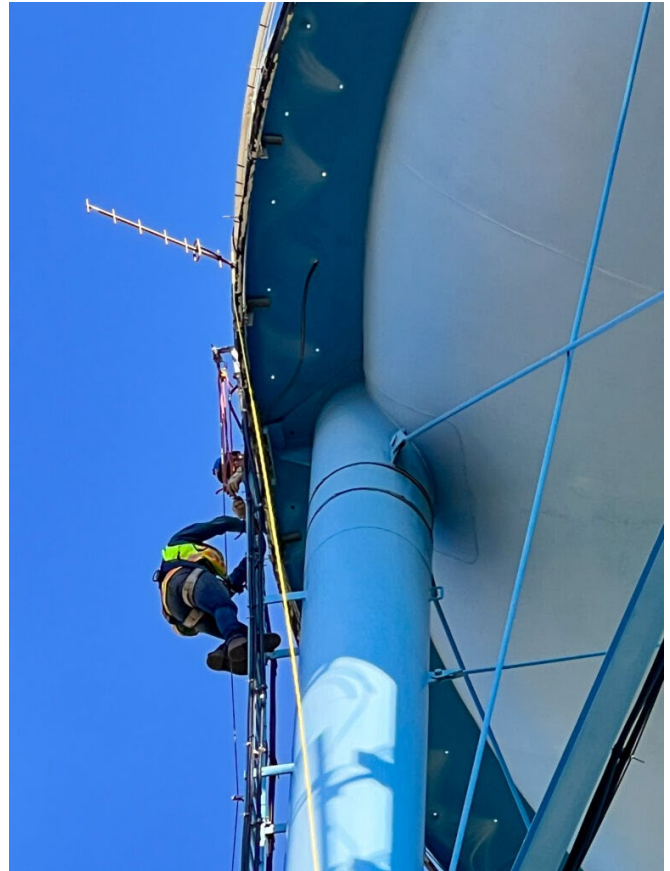
Of course, these aren't the drones you'll find on Amazon; they are commercial grade remote-controlled vehicles that cost more than most luxury sports cars. Pilots are trained to send them into hard-to-reach areas, both underwater and aerial, capturing high-definition photos and videos

that are uploaded onto the technician's laptop. The footage is then scanned for visual cues of structural distress or used to create 3D models.

"Not too long ago, aerial drones could only be flown outside or in the sightline of the operator. The technology has improved significantly, allowing us to fly them into below-grade concrete spaces with no connection to outside GPS," Bilyk says. "It only requires two feet of radius, so about the size of a manhole. This is really useful for navigating any intricate series or maze of below-grade structures. You just need a strategic entry with egress points well planned to ensure the battery doesn't die before you can get out."

From reservoirs and wastewater to rooftops and elevator shafts, ROVs are bringing eyes to places formerly unseen, finding cracks, concrete spalling, exposed reinforcing steel and other flaws along the way. Traditionally, divers and technicians equipped with GoPros and other cameras were relied upon to document what they could, and not always in the safest conditions. This meant sometimes problems were missed, or poor-quality images were gathered. Today, drones are able to hover in place, taking thousands of near-perfect photos per minute while simultaneously capturing video. Meanwhile, 3D models created from the scans greatly assist with [condition assessments](#), allowing the technicians to pinpoint exact locations of distress or deterioration, and better inform the repair documents.

ROVs are also instrumental for non-destructive testing at remote or otherwise inaccessible locations. For example, when testing for metal and coating thickness, a probe can easily fly into a water tower, where it can rest on the structure and obtain material thicknesses without the need for physical samples, which leaves damage.



Daniel Bilyk climbing a water tower in Edmonton, AB



"This technology has provided huge advantages to our sector," says Bilyk. "It has reduced the exposure of humans to potentially dangerous situations, eliminated the need for scaffolding, and allowed assessments to be completed in a timelier manner—all of which reduce the cost for buildings owners and creates a safer work environment."

For more information, please visit www.rjc.ca or contact Daniel Bilyk directly at dbilyk@rjc.ca