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Scuba gear and databases

Here's the thing about really good engineering - when it's done well, nobody notices. For example, when you're driving down the highway, how often do you pause to acknowledge that the bridge you've just driven across actually supported the weight of you, your minivan and the soccer team that's singing at the top of their lungs in the back?

To make sure that those bridges continue to do what they're intended to do, they have to be inspected regularly. And when those bridges cross over creeks or rivers, those inspections require getting wet.



Bridge supports, usually called piers, that have their foundations under water, are subject to something called 'scour,' which is the natural erosion effect caused by moving water. Left unchecked, it can undermine the structural integrity of the pier and significantly weaken the bridge. As part of its required maintenance program, the Illinois State Toll Highway Authority asked WHKS to conduct hydraulic and structural analyses and determine the risk of scour to the bridges on six segments of the tollway system.



These inspections had two components. The first was to get under each of about 75 bridges and conduct a visual inspection. That meant boats, survey rods, hip waders and the occasional unintended soaker. If the water was more than six feet deep, the inspection required a licensed engineer who is also a certified diver with scuba gear.



The second component was back in the office using the field-collected geotechnical information, bridge-specific structural data and specialized hydraulic analysis software to determine the true scour risk. All this data and results are used to populate the bridge database that the Toll Authority is required to maintain by the Federal Government.

Boring? At times, perhaps. But isn't it nice that, as you and the soccer team roll over the bridge on the way to Dairy Queen, you're safe and blissfully unaware of databases, hydraulic analysis and scour?

