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PUMPER & CLEANER ENVIRONMENTAL EXPO INTERNATIONAL
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PAGES 22 & 42

Chris Patrick
Operations supervisor
St. Louis, Mo.

BRINGING IT ALL TOGETHER
PAGE 10

St. Louis tightens up its collections system with major improvements and continuous maintenance

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INSIDE:

PIPELINE REHABILITATION AND RELINING

ON THE COVER:
Operations supervisor Chris Patrick and the Metropolitan St. Louis Sewer District are working on the first phase of a multi-decade, $4.7 billion capital improvement and replacement program to update and rehabilitate its aging collections and treatment system — one of the nation's largest and most complex. (Photography by Jerry Naunheim Jr.)

FEATURES

COLUMNS

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ALL ON THE SAME PAGE

Getting the public on your side may not be easy, but it's critical to your success

FROM THE EDITOR

Luke Laggis

Conservation is a topic on the minds of all water distribution professionals. Drought conditions that swept across much of the U.S. in the summer of 2012 brought it to the forefront, especially in areas that are dry to begin with.

I recently came across a story from Eugene, Ore. It highlighted the "unintended consequences" of the decrease in water usage in the local service area. Utility board commissioners were weighing a possible rate increase because water use has declined 20 percent over the past four years. Like most water utilities, it has high fixed costs and needs to offset the loss of revenue.

The story quoted one local man who wasn't happy about the increase but nonetheless understood. He pointed out that the public utility has to cover its costs. "It's not [the utility] against us, [the utility] is us," he said. I wanted to track this person down and thank him for taking responsibility and ownership for his small part of the equation, especially in a society where it seems everyone wants everything and no one wants to pay for anything.

The comments following the story were 100 percent against the rate hike. Rationale ranged from government inefficiencies to the cost of utility employees' retirement benefits. There were no comments about the future cost to ratepayers if rates weren't increased and the revenue deficit was made up through other means, like cutting back on system maintenance. Most commenters lacked that foresight.

The cities of St. Louis and Toronto, both profiled in this issue, have their own stories about making up for lost revenue and getting public buy-in on expensive capital improvement projects.

Toronto funds its water system entirely through revenue generated by ratepayers. The utility serves not only the city, but also clients in the neighboring regions of York and Peel. Water conservation efforts, however, represent a double-edged sword for the utility, which has seen revenue decline along with the volume of water consumed.

Michael D'Andrea, director of Water Infrastructure Management with Toronto Water, says the utility is constantly challenged to balance rate increases with reductions in operating costs in order to devote additional resources to capital improvements.

Public buy-in is just as important on the collections side, too. The St. Louis Metropolitan Sewer District is in the midst of one of the largest construction undertakings in the region's history. MSD authorities say there is a very clear "people" side to the project.

While the water quality regulations are paramount — the city is under consent decree — authorities say that it's just as important that the public understand the district's watershed concept, especially the impact of stormwater. They say it's what people do at home that makes the difference, and it takes a lot of individual actions — everything from landscaping, to fertilizer, to household hazardous materials and pet waste.

While the consent decree provides marching orders, they say they have to change individual behavior and change the culture if they're going to be successful at developing these projects.

So what can you do? Much like the people in St. Louis, you need to take advantage of any opportunity to change the culture among utility customers. The majority will never side with rate increases — or any large expenditures — if they don't have a clear understanding of what it will cost them if they ignore the problem. As utility managers, you have a difficult job, and adding ombudsman or community outreach specialist to your list of responsibilities won't make your day any easier. But it could make tomorrow easier, and if you can reach people and inform them, every day after might get a little easier, too.

As utility managers, you have a difficult job, and adding ombudsman or community outreach specialist to your list of responsibilities won't make your day any easier. But it could make tomorrow easier, and if you can reach people and inform them, every day after might get a little easier, too.

It's a tall order, but getting public buy-in is critical for the future of public utilities. I hope these stories can provide a bit of inspiration for you and your crews. It's a difficult job, but maybe one day your customers will thank you for it.

Enjoy this month's issue. ✦

Construction laborer Frank Coleman lowers an inspection camera into a sewer as a crew from the Metropolitan St. Louis Sewer District works on pipeline rehabilitation in Ballwin, Mo., a St. Louis suburb. (Photos by Jerry Naunheim Jr.)

FOCUS: SEWER

BRINGING IT ALL TOGETHER

St. Louis MSD takes on a large-scale revamp of a sprawling collection system that dates to the Civil War era

By Jim Force

So how does a sewer district that once consisted of 79 different systems in 91 separate communities and has pipes up to 150 years old eliminate hundreds of combined and sanitary sewer overflows and basement backups while staying on schedule and complying with a consent decree in the process?

The Metropolitan St. Louis, Mo., Sewer District (MSD) is staying centered on their management plan, engaging the community, using a range of technologies — both gray and green — and doing maintenance around the clock.

MSD is working on the first phase of a multi-decade, $4.7 billion capital improvement and replacement program to update and rehabilitate its aging collections and treatment system — one of the nation's largest and most complex. Over the last 20 years, MSD has invested over $2.5 billion to remove more than 350 overflows from its system; the current phase of the project will address the remaining 350+ overflows over the next two decades. In addition, MSD is rehabilitating interceptors, pump stations and force mains, and making improvements to its wastewater treatment plants.

"The original sewer system was built separately over the years," says Brian Hoelscher, MSD's director of engineering, describing a series of smaller independent networks that developed as the metro area grew before the creation of the MSD in 1954. "We probably have a lot of smaller pipe sizes and more footage than you'd find elsewhere, and that defines cost. Our trunk system is not well laid-out. It's our biggest technical challenge."

Background

MSD is the fourth largest sewer district in the United States, serving over 1.3 million people residing in the City of St. Louis and about 80 percent of surrounding St. Louis County — a total of 525 square miles. The district maintains approximately 425,000 residential and commercial accounts, and operates 9,700 miles of combined, sanitary and storm sewers, 275 pump stations, and seven wastewater treatment plants that treat a combined average of 370 million gallons a day. A few of the sewers in the central city area date to the 1850s and are constructed of brick, clay and even wood in some places. "About 70 percent of our lines are 12-inch or smaller pipe, and some of what we call 'horseshoe' sewers are up to 20 feet in diameter," says Hoelscher.

Starting in the early 1990s — and after decades of work to consolidate dozens of small treatment plants into larger regional facili-

> "Up to this point, we've been working on the overflows that are easy to get to — the low-hanging fruit if you will. We started with well over 400 SSOs and we're down to fewer than 170."
>
> Brian Hoelscher

PROFILE:
Metropolitan St. Louis, Mo., Sewer District

FOUNDED:
1954

SERVICE AREA:
525 square miles (all of the City of St. Louis, 80 percent of the county)

POPULATION SERVED:
1.3 million (425,000 residential and commercial accounts)

INFRASTRUCTURE:
9,700 miles of sewers; seven wastewater treatment plants (370 mgd total)

EMPLOYEES:
957 (authorized workforce number)

2013 BUDGET:
$176.9 million (operations), $234.3 million (capital improvement and replacement program), $61.3 million (debt service); total $472.5 million

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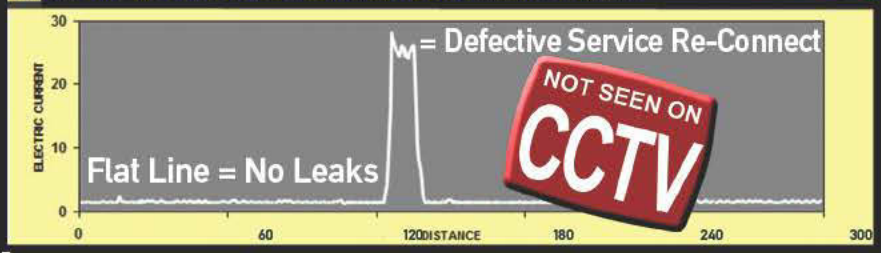

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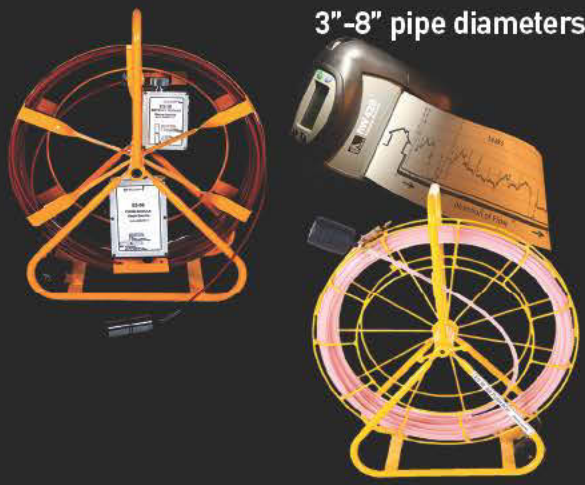

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Construction laborer Frank Coleman pulls the CUES inspection camera out of a manhole after inspecting the sewer line.

ties, construct large trunk sewers to help integrate 79 sewer systems, and other efforts to ensure treatment of all flows during dry weather — MSD began to keenly focus on overflows.

In 2007, the State of Missouri and the U.S. Environmental Protection Agency filed a lawsuit against MSD resulting in a consent decree requiring MSD to spend $4.7 billion to address the remaining overflows and make other system improvements over the next 23 years.

"The current work is actually a continuation of the work we started back in the 1990s," explains Lance LeComb, MSD's manager of public information. "In the 2000s, we recognized the use of consent decrees by the EPA to address these types of issues nationally. Thus, we had already put processes in place and were ready to go when the lawsuit was filed. If anything, the consent decree shortens the schedule we had anticipated, but doesn't change much else for us."

Hoelscher says, in some ways, the consent decree actually serves as MSD's strategic plan for the next 23 years. "We stay very focused on it from an operational and capital expenditure standpoint," he says. "From there, we translate it back to our ratepayers so they understand where their dollars are going."

Construction and repairs

While MSD makes plans and finalizes designs to meet the regulatory requirements of the consent decree, St. Louis citizens are already benefiting from the results of the previous capital projects.

"Up to this point, we've been working on the overflows that are easy to get to — the low-hanging fruit if you will," says Hoelscher. "We started with well over 400 SSOs and we're down to fewer than 170. It's a continuous process for MSD, and we've been able to take care of basement backups, get rid of local surface discharges in yards and other areas where people can see standing overflow water. We've addressed debris and other unsightly conditions."

The work has involved remediating infiltration and inflow conditions — much of it in the old piping system MSD inherited — and enlarging pipe sizes to accommodate more capacity.

Wherever possible, St. Louis is relying on CIPP technology to line existing sewers, using a variety of local contractors. In other areas, "conventional dig" methods have been necessary. "In some situations, especially the brick pipe areas, we encounter collapsed sewers or sewers that have deteriorated to the point where they have to be completely replaced," explains Hoelscher. "We literally can't get our CCTV (closed circuit television) units through the pipe." Jonathon Sprague, MSD's director of operations, adds, "We do approximately two lining repairs for every one where we have to dig and replace."

Sprague estimates the district has been increasing the amount of trenchless lining work each year over the last 20 years. "In the early years, we were doing about $5 million in lining a year, but now that's up to about $20 million a year," he notes.

"CIPP has been very effective in taking care of structural concerns in the system," he adds. "Some

PROTECTING HOMEOWNERS

Basement backups are not only an inconvenience; they can be expensive. That's why the Metropolitan St. Louis Sewer District (MSD) has a program to help homeowners pay for damages caused by backups.

Since the lateral line is the homeowners' private property, the St. Louis policy (as with other sanitary districts) is that the maintenance and repair of the lateral line is the responsibility of the homeowner. But if the backup is caused by the failure of MSD to properly maintain the public sewer, then MSD is responsible for paying the damages.

"If your basement backup was caused by a blocked sewer, our crews will record that information and forward it to MSD's insurance claim adjuster. The adjuster will contact you to access your damages. Just like any other insurance claim, be sure to document your damages," reads the district's instructions.

"It's our own penalty, to a certain degree," says Jonathon Sprague, MSD's operations manager. "It pays for us to go out and eliminate maintenance issues before there's a problem."

The Metropolitan St. Louis Sewer District team includes, front row, from left, construction laborer Frank Coleman, operations supervisor Chris Patrick, and assistant operations supervisor Mike McDowell. Back row, collection system team leader Gregg Hall, collection system operator Jonny Welch and collection system operator Dan Kateman.

(continued)

of our I&I issues are actually caused by leaking storm sewers (alongside the sanitary lines). When we line the storm sewer, we eliminate the infiltration issues."

Another benefit of CIPP, he says, is the prevention of root intrusion and the backups that roots can cause. MSD identifies the sewer lines needing CIPP through the use of eight CUES CCTV units. MSD utilizes four of its CCTV trucks to perform proactive inspections, and the other four to investigate problems areas.

The district also operates two four-man internal CIP point repair crews, utilizing the Infrastructure Point Repair System from Infrastructure Repair Systems. Typical defect repairs include cave-ins, leaking joints, root intrusion and defective pipe, and each crew tries to complete two point repairs per day.

"The district typically utilizes the point repair system to repair defects in our sanitary s ewer system," says Sprague. "We keep a variety of point repair kits, from 2 feet to 8 feet for both cold weather and warm weather applications.

"We have embraced this technology not only because it is more cost effective than conventional open trench repair, but is also safer for personnel than working in a 15-foot trench, and less disruptive to neighborhoods and streets. Comparing costs, the district can make five or six CIP point repairs for the same price as one conventional open trench point repair."

"The original sewer system was built separately over the years. We probably have a lot of smaller pipe sizes and more footage than you'd find elsewhere, and that defines cost. Our trunk system is not well laid-out. It's our biggest technical challenge."

Brian Hoelscher

In addition to sewers, MSD has been hard at it on the 162,000 manholes throughout the system. Sprague explains that the district takes a proactive approach. In the warmer weather, half a dozen four-man crews are out repairing defective manholes using the spin-casting spray lining technique. In colder weather, which is unsuitable for spraying, Sprague's team is divided into a dozen two-man crews devoted to manhole inspection.

Frank Coleman, left, Dan Kateman and Gregg Hall prepare an Infrastructure Point Repair System liner for a pipeline rehabilitation job. RIGHT: The liner is ready to be lowered into the pipe.

Keeping it clean

As any collections system manager knows, keeping the system clean can be just as important as repairing and rebuilding the lines. St. Louis has adopted an aggressive maintenance and cleaning program, launched five years ago with the adoption of a comprehensive CMOM (Capacity, Management, Operation and Maintenance) program.

"Our mantra is clean, inspect, repair," says Sprague. "Fully 95 percent of our backups were on our 12-inch-or-under clay line. We have about 4,000 miles of that and so far we've cleaned all 4,000 miles, and we've started on our plastic pipe.

"We've cut basement backups by nearly 70 percent," he says, adding that dry weather overflows have been cut in half as well.

Sprague says the district uses cleaning to drive its inspection program. "When we clean, we use that occasion to do a rudimentary inspection. We record the amount and type of (materials) roots, grease or debris by inserting buckets and measuring how much material we get out."

Using Vactor rodder trucks, MSD cleans about 1,000 miles of sewer line each year, Sprague estimates.

Going forward

As St. Louis moves ahead with the next phase of its sewer improvement program — a public vote on a $945 million bond issue passed with 85 percent in favor last June — the district will employ both gray and green solutions to meet the new regulatory requirements and improve service to its ratepayers.

For CSO control, Hoelscher explains that the western and southern portions of the combined sewer area discharge to small streams that empty into the River des Peres, which ultimately flows to the Mississippi.

In this region, CSOs will be controlled through the construction of one main and two smaller deep tunnels. The main tunnel will be 28 feet in diameter and 8.97 miles long; the smaller ones will be 20 and 24 feet in diameter and 2.27 and 1.7 miles long, respectively. "The plan is to take stormwater overflow and direct it to the deep tunnel storage system, and then to treatment," explains Hoelscher. "Currently, the tunnel system is in geotechnical design. The plan is to start construction in about 10 years."

The rest of the MSD combined service area to the north and east discharges directly to the Mississippi, and here the district plans to employ a range of green solutions to control stormwater at its source.

"There are no open channels to the river," Hoelscher explains. "They've all been closed in with combined sewers. While the discharges already come close to meeting the secondary contact standards for the Mississippi, we want to mitigate the impact as best we can.

"We're planning to spend about $100 million on green solutions that capture the overflow water at its source, delaying it and prevent-

ing it from entering the river," he says. "Our goal is to reduce the overflow by at least 10 percent."

Among the techniques to be employed are rain gardens, green roofs, planter boxes, regional detention basins and permeable surfaces.

Key to success is a unique $3 million EPA-approved pilot project MSD is conducting to test the effectiveness of various natural solutions.

"In the northern part of our district, we have a great deal of lower income properties. Much of the property is owned by the city and is ripe for development," Hoelscher explains. "We're able to use these properties to demonstrate various forms of green infrastructure. In one case, we're looking at a whole block detention area. The response from residents and local entities has been encouraging."

Hoelscher says one organization that has been especially supportive is Habitat for Humanity. "They're excited about building green infrastructure into the properties they're rehabbing," he says.

In another phase, the district is buying up flood-prone homes and moving residents to comparable housing. The program improves the lots of homeowners while allowing the district to return the land to its natural state and improve flood abatement.

"We are working with partners, stakeholders. The pilot program enables us to see what projects work, which ones provide the biggest bang for the buck," Hoelscher says.

MSD plans to complete the pilot program and obtain the go-ahead to spend the $100 million from state and federal regulators by 2015. "Then we can really start cranking out some green infrastructure," Hoelscher says.

The people side

There's a very clear "people" side to the massive St. Louis project, one of the largest construction undertakings in the region's history. For one thing, the program means jobs and its completion will assure continued economic growth in the region.

For another, the project's managers need to have the community on their side as they spend public funds and drive construction through neighborhoods and backyards.

While the water quality regulations are paramount, Hoelscher and Sprague say that it's just as important that the public understand the district's watershed concept, especially the impact of stormwater. They say it's what people do at home that makes the difference, and it takes a lot of individual actions — everything from landscaping, to fertilizer, to household hazardous materials and pet waste.

While the consent decree provides marching orders, they say they have to change individual behavior, change the culture if they're going to be successful at developing these projects.

The plethora of small communities in the district can add to the challenge. "In some cases, we're in the backyard of a homeowner in one community, working on a sewer across the property line which is actually in another community," Sprague points out. "We need to communicate one-on-one … that we're a team, we're one community."

Public information manager LeComb puts it this way: "Our main function is to provide a service to our ratepayers, whose sewer rates are going to increase every year for several years. They may not understand (the full scope of the consent decree work) but they may experience a basement backup first hand."

He says as the project eliminates these backups, customers can see that the program is working.

"We need to take advantage of the opportunity to show folks how we're spending money to build a true 21st century system," he says. "Not one that's rooted in the construction practices of the previous century." ✦

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LIGHT AT THE END

The South Coast Water District is working to stabilize a half-century-old tunnel that forms the backbone of its sewer system

By Peter Kenter

California's South Coast Water District (SCWD) is blessed with a spectacular view that cuts a picturesque swath along the Pacific Ocean 60 miles south of Los Angeles. The district also benefits from a man-made feature — a two-mile tunnel carved through the ocean bluffs of South Laguna — that protects the sewer line serving a third of its customers.

The SCWD's mandate is to ensure reliable, adequate supplies of water and the safe collection and treatment of wastewater for residents and businesses in Dana Point, South Laguna and areas of San Clemente and San Juan Capistrano. The gravity sewer line inside the tunnel primarily serves northern Dana Point and South Laguna, carrying 1.1 million gallons of wastewater per day for treatment.

"The tunnel was built in 1954 when the area of Laguna Beach was rural and undeveloped," says Mike Dunbar, recently retired SCWD general manager. "The South Coast Highway (SCH) wasn't yet complete and dirt roads served a few dozen or so resort homes that belonged to celebrities like TV star Ozzie Nelson. The district blasted the tunnel about 6 feet in diameter and dug out the rock by hand, then installed a 21-inch vitrified clay pipe (VCP) operated entirely by gravity. The foresight of that project has saved the district more than a million dollars by eliminating the need for five to seven lift stations along the coast and the electricity required to operate them."

While the sewer tunnel was built to last, it featured typical creosote-covered wood beams commonly found in mine tunnels. It

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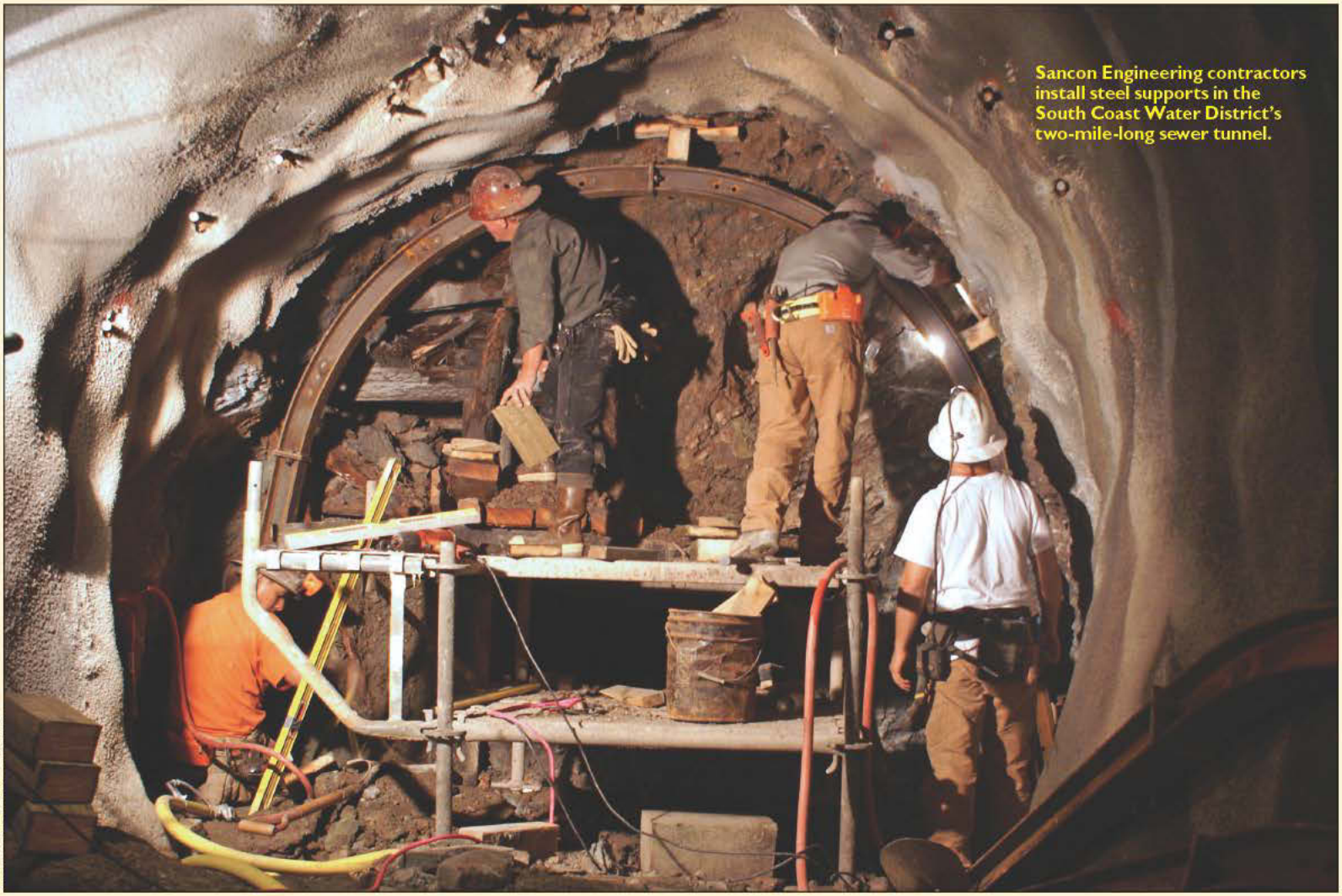

Sancon Engineering contractors install steel supports in the South Coast Water District's two-mile-long sewer tunnel.

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PHOTO COURTESY OF SCWD

All materials and equipment used for emergency tunnel repairs were brought in using a workboat because the Beach Interceptor Sewer Tunnel is located within the bluff beneath multi-million dollar homes. There is no road down to the beach, and the rocks of the coastal bluff prevent driving to the beach from the north or south.

also offered a few access points in case the tunnel or sewer line ever required repair. The clay sewer line was crushed in place and replaced by a 24-inch Techite reinforced plastic mortar pipe in 1974.

Sewer tunnel assessed

The tunnel system was assessed in 1997 and inspected several times in the early part of the following decade while ongoing repairs were carried out. The sewer line, however, remained intact with no spills. In 2006, engineers from Hatch Mott MacDonald (HMM) carried out an overall condition assessment of the tunnel.

"This was an end-to-end assessment, with the inspection team walking through the tunnel," says Joe McDivitt, director of operations/Tunnel Stabilization Project leader with SCWD. "There were a few areas where the ceiling had fallen in around the sewer pipe, but we had everything inside the tunnel mapped out as a result of that inspection."

Of immediate concern was a 400-foot section of tunnel that required emergency repair. HMM designed repairs in which the rotting timber supports and loose rock were removed and the damaged sections were repaired by contractors in 2007. Contractor access to the beach was limited to a very steep set of public stairs, so all construction equipment and materials were transported to the beach site using workboat barges that supplied a small staging yard.

> **"With the workboat, all of the equipment and the sudden arrival of crews, it looked like the landing at Iwo Jima."**
>
> **Mike Dunbar**

A tunnel entryway, Adit 15 at Thousand Steps Beach was enlarged to allow better access to workers and equipment. Inside, a small skid-steer loader with a bucket attachment mucked out one face of the tunnel, while a Takeuchi TB016 excavator outfitted with a rock breaker attachment excavated the tunnel. As fresh supplies arrived, the workboat removed construction debris.

"With the workboat, all of the equipment and the sudden arrival of crews, it looked like the landing at Iwo Jima," says Dunbar.

Once the tunnel was excavated, the contractors lined the interior with shotcrete and installed a new concrete floor that encased and

(continued)

PROFILE: South Coast Water District, Laguna Beach, Calif.

YEAR ESTABLISHED: 1932

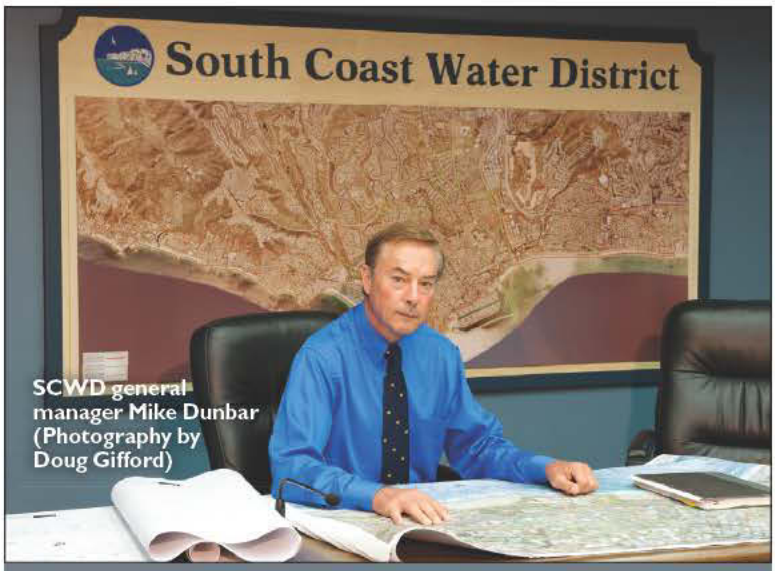
POPULATION SERVED: 12,300 water and 17,800 sewer connections serving 40,000 residents and 1,000 businesses

AREA SERVED: 8.3 square miles

DISTRICT STAFF: 85

INFRASTRUCTURE: 140 miles of sewer line, 3 miles of force mains, 3,800 manholes, 14 lift stations; 147 miles of water mains, 9 pump stations, 14 reservoirs

ANNUAL DISTRICT BUDGET: $655.2 million (2012-13)



SCWD general manager Mike Dunbar (Photography by Doug Gifford)

RECYCLED WATER HELPS CONSERVATION EFFORTS

California is known for its extensive irrigation systems, and the South Coast Water District (SCWD) is no exception. To help conserve potable water, the district maintains 15 miles of water mains specifically devoted to bringing recycled water to larger commercial irrigators.

The recycled water is wastewater processed by the district's Advanced Wastewater Treatment Plant, where it is treated, filtered and disinfected so that it can be used for irrigation. Commercial customers and homeowner associations specifically request a recycled water account and are trained by the district in its use.

Recycled water is differentiated from drinking water by pipes and devices that are colored purple. All valves and sprinkler heads are identified as using recycled water and signs are posted in areas where it is used for irrigation.

In the 2010-2011 year, the district delivered 270 million gallons of recycled water to approximately 175 customers who used recycled water for the irrigation of parks, golf courses, playgrounds, greenbelts and common areas of homeowner associations.

"Expanding the recycled water system is one of the top five priority capital projects for the district," says Mike Dunbar, recently retired SCWD general manager. "We're planning to upgrade and extend recycled water lines, to integrate treated effluent from other treatment facilities and to create a recycled water reservoir to increase our storage capacity. Use of recycled water in the district really helps to offset the amount of drinking water used for these purposes, and protects our water supply."

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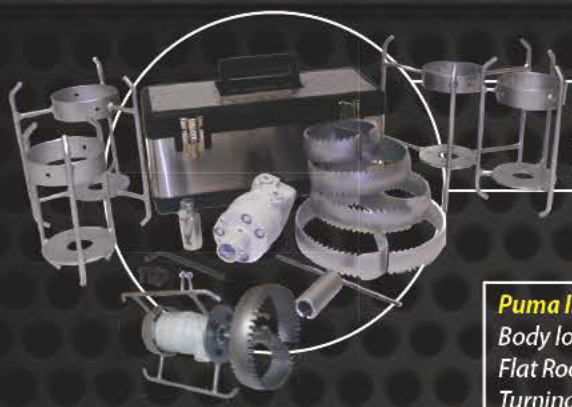

Puma Hi-Torque Hydraulic Root Cutter kit *includes the Hi-Torque low speed motor with 235 ft/lbs. of torque. This Kit includes 4 EZ-Skids, 4 Concave or Flat Root Saws in 6", 8",10" and 12". Includes Tool Box, Saw hub, Motor Turning Tool, Allen wrench and instructions.*

Puma Intelligent Hydraulic Root Cutter kit *includes the Our Round Body low speed motor. Kit includes 4 EZ-Skids 4 Concave or Flat Root Saws in 6", 8", 10" and 12". Includes Tool Box, Saw hub, Turning Tool, Allen wrench and instructions.*

The "Deep-Vac" Manhole Tube Holder is a "Patent Pending" design that solves a constant and at times, dangerous situation. For manholes, catch basing and Wet wells. Clamp the Deep-Vac around your tube in any location. The tube is then lowered into the manhole and supported by the Deep-Vac's 4 steel extension arms. Keep adding tubes and unclamp the "Deep-Vac" holder and move up and over the next flange connection.

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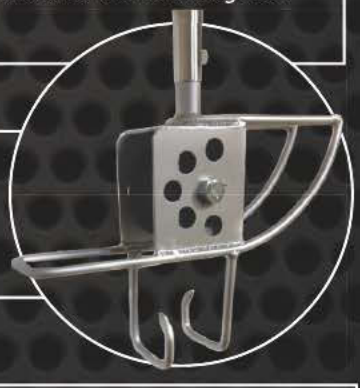
Puma Roller Grabber. *Grabs your hose and Nozzle, lowers them into sewer line or drop manholes and guides hose around a nice Nylon Roller. Bottom hooks are hardened. Connects to our fiberglass pole sets.*



Arrow Diamond Tipped Cutters *are a new and innovative tool that was designed to clean lines with calcium carbonate deposits. These cutters bore into the center of the line and chip away with four diamond segmented flutes. These flutes are made from ¼" reinforced plate with a weld on arbor made for Hydraulic Root Cutters. Available from 6" to 18".*

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From left, Water Operations crew member Bob Morton, SCWD director of operations Joe McDivitt, and Water Operations crew members Danny Takahashi and Mitch Avalos.

"We inspect and clean the entire system over a five-year period and we focus on certain hotspots, where we expect to find grease buildup, for example, as often as quarterly. Overall, we have a good track record with staying on top of system maintenance, with perhaps one or two sewer spills a year, some caused by contractors. However, zero spills remains our standard and goal."

Joe McDivitt

Sanitary Operations crew member Justin Davis lowers a CUES camera into a sewer.

protected the 24-inch sewer pipe. "That left us with a flat bottom and a tunnel that we refer to as a horseshoe shape," says McDivitt.

Tunnel rehab recommended

The tunnel condition assessment conducted by HMM recommended that the entire tunnel be rehabilitated. Each section of the tunnel was assigned a rating regarding its condition and the time frame in which repairs should be carried out.

"Within the environmental impact reporting regulations required by the California Environmental Quality Act, we analyzed project alternatives and consulted with stakeholders, engineers, consultants and contractors," says McDivitt.

Alternative construction approaches that were considered included: no action; construction of a new tunnel built above, below or inland of the existing tunnel; construction of a new tunnel and pipeline following the SCH; construction of a new sewer line in the SCH with new lift stations on the coast; construction of one lift station and a smaller sewer line next to the existing line; and filling the entire tunnel with concrete and sliplining the old sewer line.

"We eventually finalized the design work, building upon the basic construction design methods employed in 2007, and received approval to move forward from the district's board of directors in November 2010," says McDivitt. "We struggled with the idea of how to keep the existing pipe in service while construction work was ongoing and we ultimately decided to install a new 24-inch sewer line off to one side, on top of the new concrete floor. We're pretty well built out in this area, so a line of that diameter will continue to serve roughly 15,000 people with capacity to spare. With the new line in place we'll be able to use the lower line until construction is completed and then switch back to it as a redundant system if we ever need to take the new line out of service due to maintenance."

The interior of the new tunnel will measure about 8 feet high and 8.5 feet across, retaining the horseshoe shape achieved in 2007. However, many of the project challenges of the 2007 emergency repair remain in place.

No blasting options

"There will be no blasting like they employed in 1954. The area is settled and there are million-dollar mansions and other properties overhead," says Dunbar. "We plan to use a small track hoe to chip at the rock, or a road-header tunneling machine with a grinding head to bore out the tunnel."

"However, to stabilize and enlarge the tunnel we must acquire underground easements from private property owners on the bluff. It's a challenge to acquire 200 easements, with an offer and a package for each owner."

The SCWD has also purchased a small vacant lot on SCH inland from the coast for its main construction staging area. Construction of a shaft on that lot will descend to a depth of 100 feet, and a connector tunnel under SCH will give crews necessary access to the tunnel.

"We'll still be in permitting with the California Coastal Commission for another year," says Dunbar. "They are very specific in their permitting and usually require a lot of mitigation efforts to impacts in and around the facility. Inland, traffic concerns are more of an issue, but there's a heightened consciousness of ocean water quality with the agencies along the coast."

The cost of the five-year reconstruction project, which should provide 100 years of service to the community, is estimated at $50 million.

ocean," says Dunbar. "If we were to ever get a call that there was a sewage spill it would literally be 'all hands on deck' to stop it. The access issues alone are challenging and it would take from 18 to 36 hours to control a pipeline break. By that time, 800,000 gallons of sewage or more would have spilled into federally protected marine life habitats and fisheries. The tunnel rehabilitation project is clearly one of the most important projects any water agency in the area has been charged with. With rigorous planning, we'll get it right." ✦

MORE INFO:

CUES
800/327-7791
www.cuesinc.com
(See ad page 39)

Vac-Con, Inc.
904/493-4969
www.vac-con.com
(See ad page 64)

Sewer line maintenance a priority

While the tunnel rehabilitation is the top capital priority of the district, the routine cleaning and maintenance of the 140-mile sewer system remains an important operational priority, as does the relining and repair of sewer infrastructure. The sewer infrastructure dates back as far as the 1930s and is made primarily of VCP, ductile iron and PVC.

PHOTO COURTESY OF SCWD

The tunnel, as it existed for decades, with a suspended cast iron sewer lateral entering through an adit door and braced by pipe supports.

The district uses outside contractors for cured-in-place pipe lining, but performs short line repairs up to 25 feet in length using in-house crews.

SCWD owns and operates two Vac-Con combination trucks and a jetter. It also performs its own CCTV inspections using a CUES sewer mainline and lateral inspection system with Granite XP software.

"We inspect and clean the entire system over a five-year period and we focus on certain hotspots, where we expect to find grease buildup, for example, as often as quarterly," says McDivitt. "Overall, we have a good track record with staying on top of system maintenance, with perhaps one or two sewer spills a year, some caused by contractors. However, zero spills remains our standard and goal."

The district has never experienced a sewer spill onto the beach or ocean from the tunnel sewer line since it opened in 1954.

"Our tunnel is located 30 or 40 feet from the

LEARN AND GROW AT THE EXPO

Expo education seminars offer cutting edge information on the tools, techniques and best practices to make your utility stronger

By Luke Laggis

An Education Day seminar at the 2012 Pumper & Cleaner Environmental Expo.

Education is the foundation for all progress, and there's nowhere to build a better foundation than at the 2013 Pumper & Cleaner Environmental Expo. This year's Expo features one of the most expansive lineups of educational opportunities in the event's 33-year history.

First off is Expo Education Day, Monday, Feb. 25, which has grown greatly in scope and attendance over the years. Tracks of seminars are sponsored by a variety of professional organizations, including the National Association of Sewer Service Companies, WaterJet Technology Association and the Southern Section Collection Systems Committee. The full day of seminars includes many opportunities for sanitary, storm and water maintenance professionals to earn continuing education credits toward state certification.

The following days will feature a variety of additional seminars covering a wide range of topics, from professional techniques in the field to efficiencies gained through remote monitoring.

All of the education seminars, including a lineup of sessions presented in Spanish, will be held at the Indiana Convention Center in meeting rooms adjacent to the Pumper & Cleaner Expo exhibit halls. For more information on seminar times, locations and speakers, visit www.pumpershow.com.

Education Day seminars of interest to municipal utility professionals include the following:

Education Day, Monday, Feb. 25

WaterJet Technology Association

"Safety & Efficiency – You Don't Have to Choose!" by Gary Toothe, training manager for FS Solutions: Learn about safe and efficient use of vacuum, and how the best safety devices can actually speed up the vacuum job and make you more productive.

"Selecting the Best Jetting Tip Doesn't Have to Be Scary," by Gary Toothe: Learn the factors in selecting the proper jetting tip for sewer, pipe, tube and surface cleaning.

"Hydroexcavation – The Non-Destructive Solution," by Benjamin Schmitt, product manager for Vactor Manufacturing: Learn the distinctions between hydroexcavation and pneumatic excavation, and a review of who is using the technology and applications.

"Understanding the Power: Physics of Vacuum and How it Works," by Phil Stein: Explore how vacuum is used to remove various liquids and solids, as well as the science and calculations related to everyday job situations.

"Safe and Proper Operation of Combination Machines," by Chris Cira, president of M Tech: Learn safe and proper use, care and maintenance of combination machines, including key aspects of the NASSCO guidelines.

Southern Section Collection Systems Committee

"Seven Powerful Tools for CCTV Inspection Perfection," by Mark Hill, senior project manager, RFB Consulting: Take a "big picture" look at CCTV inspection and learn to avoid common mistakes that frustrate management.

"Easements – A Collection System Maintenance Nightmare," by Denis Pollak: Discuss the challenges faced when cleaning and inspecting pipelines with easement access and learn about the best tool technology and procedures available to maintain difficult-to-reach access points.

"Nozzle Science – The Next Generation of Tier 3 Nozzles and Beyond," by Rick Lewis: Learn about specific nozzles and their design, as well as their precise uses and alternative applications.

"Pipeline Relining and Rehabilitation Solutions," by Dave Badgley: Discuss infiltration, exfiltration, roots, corrosion and structural defects in collection systems along with the four basic styles of technology used for mainline replacement and rehabilitation of pipelines and lateral connections.

National Association of Sewer Service Companies

"Ultraviolet Manhole Rehabilitation," by Bob O'Connor and Tim Back, president and engineer with Municipal and Contractors Sealing Products: Review ultraviolet-curable resins for use in manhole rehabilitation, including joint and invert repair, corrosion protection and as a water sealer.

"Convey Your Stormwater and Plug Your Holes," by C. Timothy Fallara, City of Columbus project manager, and John P. Schroeder, civil and environmental engineer: This session will discuss achieving significant inflow and infiltration reduction to restore system capacity, as well as reducing SSOs/CSOs, and related topics.

"Jet Up! Sewer and Storm Water Cleaning," by Scott Paquet, president and CEO of NozzTeq Inc.: Learn proper jetting tech-

niques, hose line loss charts, pipe and hose sizes, jet size, and how to test truck equipment.

"Rethinking Collection Maintenance with the Sewer Line Rapid Assessment Tool or SL-RAT," by Alex Churchill, CEO of InfoSense: Get to know the SL-RAT (sewer line rapid assessment tool) and how it fills the gap between visual inspection and robotic cameras by identifying potential pipe blockages over large portions of wastewater collection systems.

"Case Study of Cleaning Large-Diameter Sanitary Sewers and Siphons," by Mark Barnett, P.E., Hydrostructures: Learn by example how to clean and inspect abandoned and active large-diameter sanitary sewer mains prior to rehabilitation. Examples include approximately 4,300 linear feet of sanitary sewer mains, ranging in size from 36 to 102 inches in diameter, and two siphons: a triple barrel consisting of 36-inch, 42-inch and 60-inch pipe, and a single barrel with 102-inch siphon.

"Pipeline Assessment Certification Program (PACP) 2013 Update Workshop," by Ted DeBoda, executive director of NASSCO: Get a look at proposed updates to the PACP, MACP and LACP manuals. Attendees are invited to make suggestions to improve the next version of the program.

Dozens more seminars will be held throughout Tuesday and Wednesday, covering everything from trenchless point repairs to utility line locating. There's a lot of knowledge to be gained, and your utility is sure to benefit. ✦

The stainless steel SewerLock cover locks to the insert rim with two laminated, commercial Master Lock keyed padlocks. The entire installation takes about 30 minutes. (Photos courtesy of Rick Walls)

BETTER MOUSETRAPS

PRODUCT:
SewerLock

MANUFACTURER:
SewerLock
408/761-5882
www.sewerlock.com

APPLICATION:
Locking cover manhole security system

BENEFITS:
Deters unauthorized entry, theft and dumping; provides odor and inflow control

USER:
City of Oroville, Calif.

UNDER LOCK AND KEY

The City of Oroville gets serious about preventing manhole cover thefts and unauthorized dumping with the quick-install SewerLock system

By Scottie Dayton

"The installation is very robust and not going anywhere. The cover is strong enough to support a person standing on it."

Rick Walls, P.E.

Vandals in Oroville, Calif., stole manhole covers for their recyclable value and dumped everything from furniture and rocks to bushes and debris down the structures. Of the six occurrences, three caused minor sanitary sewer overflows.

"Fortunately, alert citizens called us and we quickly removed the blockages," says senior civil engineer Rick Walls, P.E. "But that was three too many SSOs and we were fed up."

Walls and Public Works director Art Da Rosa, P.E., searched the Internet for solutions and found the locking cover security system from SewerLock. Oroville became the first city in the nation to install a major number of units.

Loose cannon

The city has 436 36-inch concrete manholes outside public right-of-ways. They access 6- to 8-inch clay sewers running through undeveloped land or in backyards of older subdivisions. "The secluded structures pose a greater risk for vandalism and unauthorized entry," says Walls. Many manholes belong to sewer lines installed in the early 1900s.

The first product the city selected was a plastic composite manhole cover and frame. Installation was estimated at $850 per manhole because workers would have to remove the old frame and cover, break out and clean up the mortar, lay fresh mortar on the barrel, and set the replacements. The city would bid the installation to free crews for more important work.

"I about fell out of my chair when I realized we were looking at $600,000 to secure these manholes," says Walls. "Then there was

the unknown of how much collateral damage they would suffer and the cost of those repairs. The prospect was scary."

Likely candidate

Walls returned to the Internet and found a manhole locking cover that installs below the cover. The cover is adjustable to release overflow, or it can be fitted with compression springs and a neoprene seal to control odor and pressure problems. Stainless steel units include a 10-gauge insert with two eyebolts, four 1/4-inch anchor bolts, and a 14-gauge cover with 12-gauge handle.

"SewerLock is a new company selling one product, so I had a long talk with owner Dave Ross," says Walls. "The cover is a simple design, easy to install, and guaranteed to work."

The city bought 64 units at a price similar to the composite product. R.J. Heuton Construction in Chico won the bid to install them for less than $100 each. A worker completed the project in five days.

Besides the six vandalized manholes, Walls selected structures in the most remote areas with the highest potential for trouble, yet grouped close enough together to minimize travel time. All were at-grade and accessible by truck.

No moving part

A technician from R.J. Heuton cleaned the surface of the mounting area to remove deposits that would prevent the caulking agent from bonding. He positioned the insert slightly below grade inside the manhole cover frame, then drilled into it using the 12, 3, 6 and 9 o'clock pilot holes in the insert's 1 1/8-inch skirt.

After boring with a roto-hammer drill powered by a portable generator, the worker inserted anchor bolts in the holes, then sealed the insert's perimeter with Liquid Nails. "The installation is very robust and not going anywhere," says Walls. "The cover is strong enough to support a person standing on it."

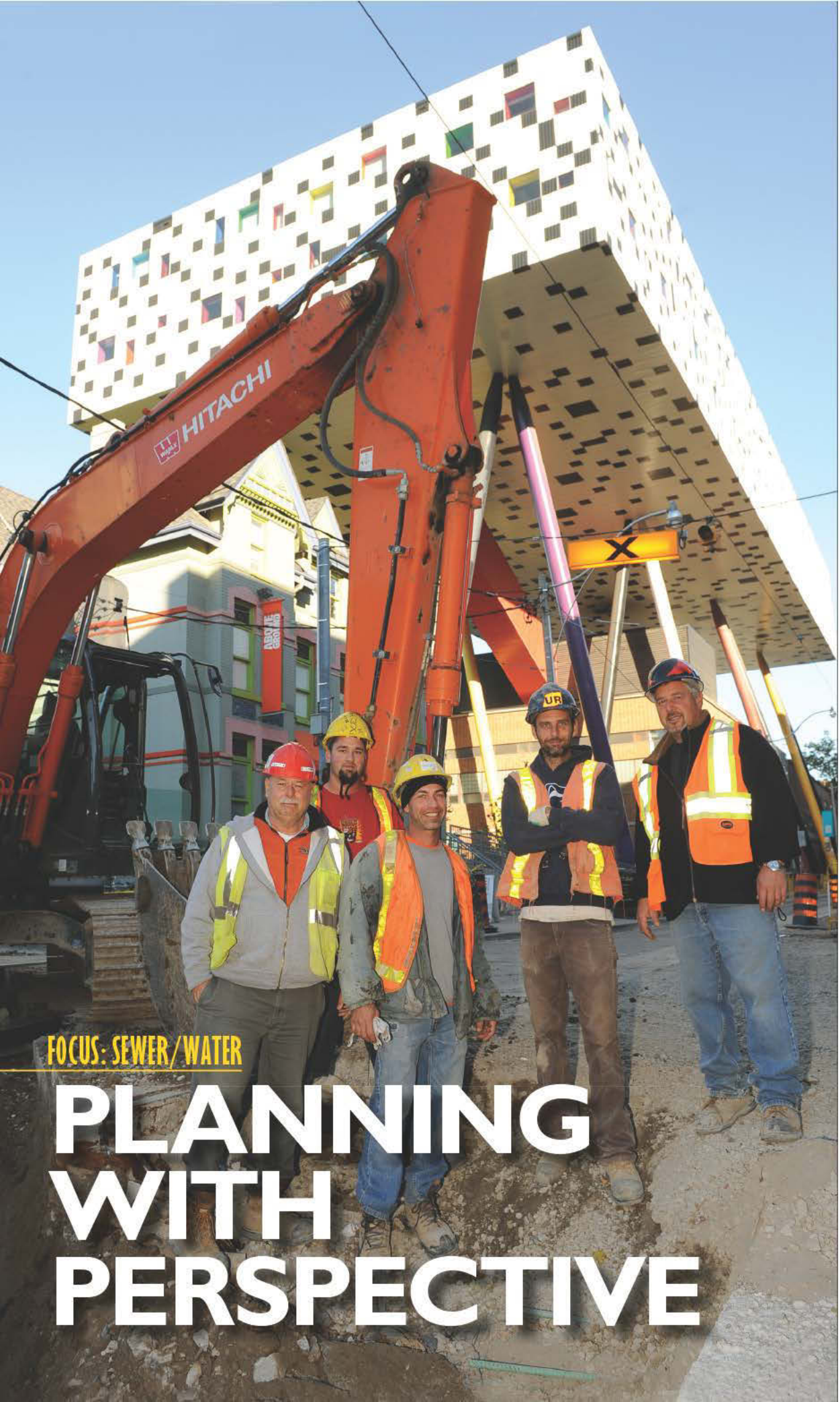
While the adhesive dried in 15 to 20 minutes, the technician installed another insert, then returned to slip the cover over the eyebolts in the rim at 3 and 9 o'clock. He lined up the matching notches in the cover, slid them over the eyebolts, and attached padlocks through the eyes to secure the cover. The entire installation took about 30 minutes.

"We looked at spending big bucks on locks, but figured anyone wanting to access a manhole badly enough would bring bolt cutters," says Walls. "That's also why we didn't purchase the anti-theft chain that attaches from the insert to the underside of the cover." The city ordered laminated, commercial Master Lock padlocks that opened with the same key.

The City of Oroville does not endorse any product or service, but Walls said they were "very happy with the product and intend to expand the program." ✦

Public Works operator Cody Nissen, left, steadies a SewerLock insert while Jeremy Wachtel uses a roto-hammer drill to bore holes in the concrete manhole cover frame. A portable Honda 2,000-watt generator supplies the power.

Two eyebolts in the rim of the insert accept notches in the stainless steel cover. The cover locks with a padlock in each eye.



FOCUS: SEWER/WATER

PLANNING WITH PERSPECTIVE

Toronto Water is using an in-house software system to find construction efficiencies across departments and overcome an infrastructure deficit

By Peter Kenter

Like most cities, Toronto is working to overcome a large sewer and water infrastructure deficit. With an assertive plan to eliminate that deficit over 10 years, Toronto Water is using an in-house software suite, T.O. INview (short for Toronto Infrastructure Viewer), to coordinate their capital works programs with other infrastructure projects, both public and private. The goal: to reduce duplication, save money, reduce traffic congestion and even work around major events, such as the 2015 Pan American Games (see sidebar).

Toronto's massive sewer and water infrastructure has a replacement value estimated at $28 billion. Its sewer and water renewal backlog was estimated at $1.7 billion at the end of 2011.

The system is entirely funded by revenue generated by ratepayers and serves not only the city, but also clients in the neighboring regions of York and Peel. However, water conservation efforts represent a double-edged sword. As the volume of water consumed declines, so does revenue.

The Toronto water main replacement crew includes, from left, Daniel Abbott, Cory Thistle, Frank Capisi, Karl Kopp and Dominic Biauchi, all from subcontractor Midome Construction Services. (Photography by Richard Bell)

(continued)

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Toronto Water has been aided by the development of a Web-based mapping program that can easily be altered as plans evolve, spending priorities change, and budgets fall into place. The system platform incorporates digitized maps tagged with information compiled through ArcGIS mapping software.

"We're constantly challenged to balance rate increases with reductions in operating costs so that we can devote additional resources to capital improvements," says Michael D'Andrea, M.E.Sc., P.E., director, Water Infrastructure Management with Toronto Water.

The division has, for example, eliminated more than 355 positions since 1998, while capital investment in the system has tripled over the past 10 years.

"We also operate under a strictly controlled legislative and regulatory framework, and that impacts both capital and operating budgets," says D'Andrea.

Unfunded projects a challenge

Necessary — but unfunded — projects have also added to the challenges. The division accelerated its capital spending by almost $250 million from 2009 to 2011. The capital budget for 2012 alone topped $600 million, including $60 million in basement flooding protection and $110 million in sewer and water main replacement and rehabilitation.

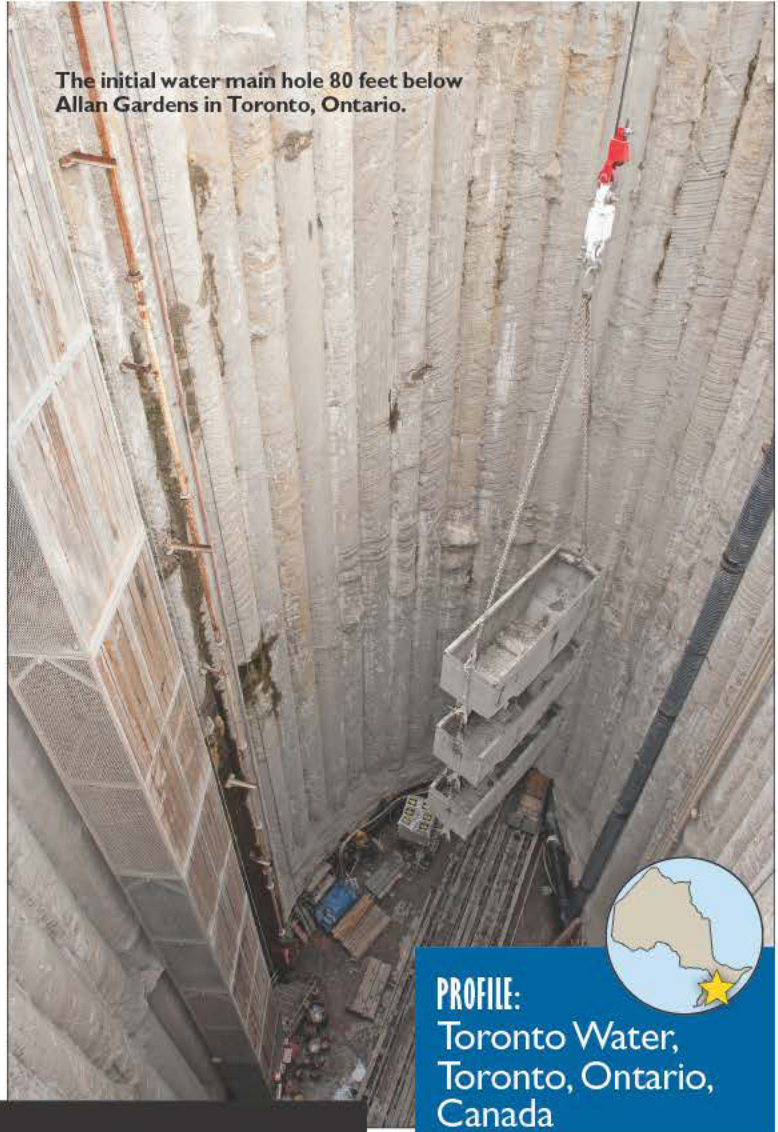
The city is just completing a $200 million upgrade to its F.J. Horgan Water Treatment Plant and several large transmission main upgrade projects are either ongoing or on the horizon.

An unfunded wet weather flow master plan, which will address combined sewer overflow into the city's Don River, among other issues, will cost in excess of $1.4 billion by 2021. Other unfunded projects over the same period will add $200 to $300 million to capital costs.

"In short, we've got a challenging decade of growth, improvement and rehabilitation ahead of us," says D'Andrea.

Toronto Water will be aided in that task by the city's newly created division of Major Capital Infrastructure Coordination (MCIC). The division is responsible for improving methods of coordination and communication among city divisions and other organizations that develop and operate utilities and infrastructure across the city. These range from the city's Transportation Services division, to the Toronto Transit Commission, provincial transit agencies, and gas, electrical and telecommunications companies.

MCIC's mantra: Early intervention in the capital planning process can mitigate the risks that arise



The initial water main hole 80 feet below Allan Gardens in Toronto, Ontario.

SEWER AND WATER WORK PLANNED AROUND 2015 PAN AMERICAN GAMES

Toronto will be the host of the 2015 Pan/Parapan American Games, the largest multisport event ever to be held in Canada, at twice the size of the 2010 Vancouver Winter Olympics. Effective infrastructure planning will be essential to reduce congestion and assure that the city presents its most photogenic face during the games. The city's infrastructure planning software, T.O. INview, is helping to achieve those goals.

"We're updating the locations of the PanAm venues and on-street competitions, to make sure that the city is out of the way of the events during that period," says Jeffrey Climans, director of Toronto's division of Major Capital Infrastructure Coordination. "We've been identifying planned infrastructure work that could conflict with the games, and determining which projects can be accelerated ahead of the games and which ones can be deferred."

Michael D'Andrea, director, Water Infrastructure Management with Toronto Water notes, for example, that a transmission main project that was scheduled during the games was located only a short distance from the new Pan American Aquatics Centre on the University of Toronto's Scarborough Campus.

"We opted consciously to defer the project to 2016 so as not to interfere with the games," says D'Andrea. "T.O. INview has proved to be a great planning tool to avoid potential conflicts."

PROFILE: Toronto Water, Toronto, Ontario, Canada

CITY ESTABLISHED:
1793

POPULATION SERVED:
3.2 million water,
2.6 million wastewater

AREA SERVED:
240 square miles city, plus additional regional

DEPARTMENT STAFF:
1,676 employees (full-time equivalent)

INFRASTRUCTURE:
3,372 miles of distribution water mains, 328 miles of trunk water mains, 2,734 miles of sanitary sewers, 807 miles of combined sewers, 2,672 miles of storm sewers

ANNUAL OPERATING BUDGET:
$893.3 million (2012)

ASSOCIATIONS:
Canadian Water Works Association, American Water Works Association, Water Environment Research Foundation, Water Environment Association of Ontario

(continued)

> **"We're constantly challenged to balance rate increases with reductions in operating costs so that we can devote additional resources to capital improvements."**
>
> **Michael D'Andrea**

when multiple organizations plan, design and build capital projects simultaneously.

"As recently as two years ago, those goals were pursued using a printed map that reflected, at a given moment, all planned infrastructure work that was approved by city council for construction the following year," says Jeffrey Climans, M.A., MIMA, PLE, director of MCIC. "By the time the document was printed, it was partially obsolete, as planning considerations for the next budget cycle, and events that were taking place in the field, led to changes in the scope and staging of capital projects depicted on the map."

Web-based solution developed

MCIC's solution was the development of a Web-based mapping program that could easily be altered as plans evolved, spending priorities changed, and budgets fell into place. A Web-based tool also offered the ability to reach out to all infrastructure operators and allow them to to share their planned capital programs with each other.

"The typical approach in developing software is to hire a consultant," says Climans. "In this case, we decided to capitalize on the expertise of existing staff and a tool kit of mapping applications that had been developed by divisions across the city. We took advantage of the in-house knowledge of infrastructure planning, development and operations, and our own IT systems and staff, to build the system internally."

The system platform incorporates digitized maps tagged with information compiled through ArcGIS mapping software (Esri). The inaugural version of the software was produced at no additional cost to ratepayers or taxpayers, and was launched in mid-2012.

Blair Bickford of Exp Global, left, and director of major capital infrastructure coordination Jeff Climans use the T.O. INview Web-based mapping system created by the City of Toronto to review an infrastructure project.

The T.O. INview Web page reveals a street map of the city. Menu options allow the user to select a choice of city construction, utility construction and third-party construction overlays. A series of sub-menus allows information to be fine-tuned.

"With a mouse click, the user can differentiate between water main replacement, water main rehabilitation, transmission water main work, water service replacement, sewer replacement, sewer rehabilitation, stormwater management projects and basement flooding protection," says Climans. "Zooming in on a particular street will allow the user to access specific project details."

Users can then overlay any other type of infrastructure construction plans, from road work to installation of fiber-optic cable by private companies who share their information with the city voluntarily.

"It's to the private utilities' advantage to participate," says Climans. "If water mains are being replaced on a street, they may choose to coordinate with the city to upgrade data lines in a particular location at no additional construction cost to themselves. By disclosing our capital program in advance, the utilities also face less risk of missing opportunities to perform work in a location that might be subjected to a construction moratorium when we're finished.

Michael D'Andrea, director of infrastructure management, Toronto Water.

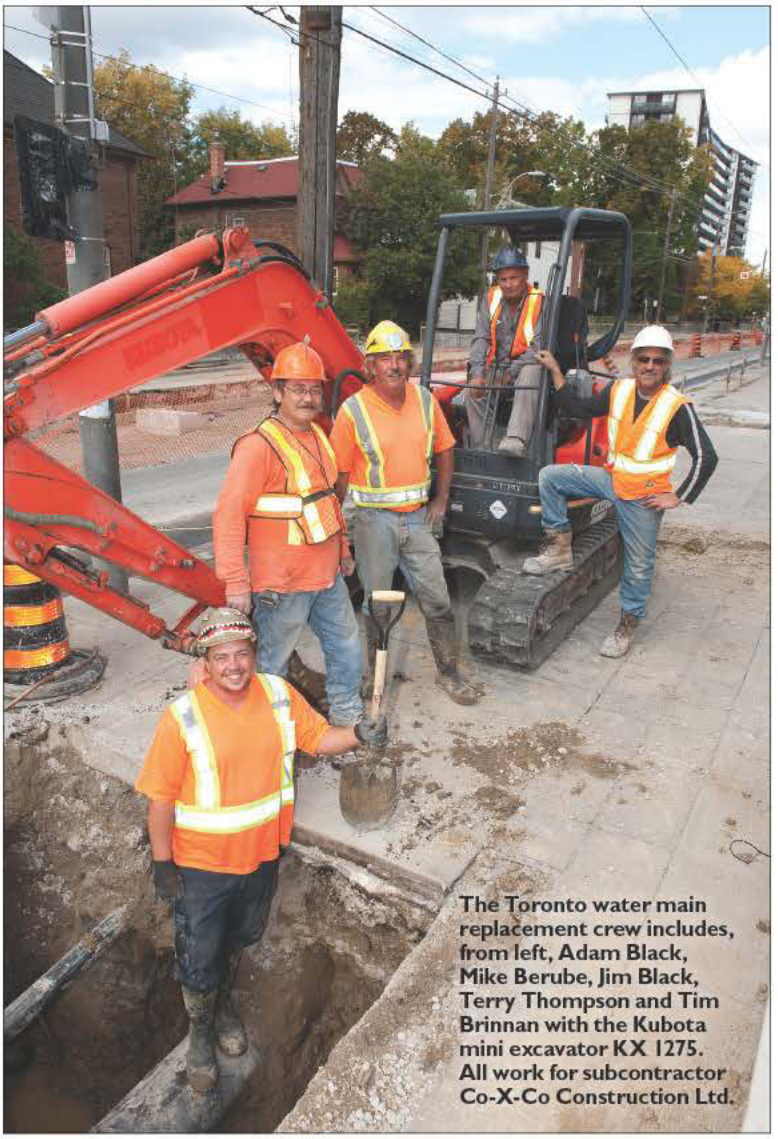
Director of major capital infrastructure coordination Jeff Climans.

Fully democratic, the software is as equally accessible to citizens who want to know why a city construction truck is parked at the manhole down the street as to senior staff in the mayor's office.

Climans says that Toronto Water was an obvious choice for the initial website roll-out. "They're the poster child for T.O. INview," he says. "Toronto Water is one of our core programs and has a highly refined internal capital planning process. They were already creating usable maps and GIS-tagging their infrastructure and it's that information we import directly."

D'Andrea notes that the visual representation of capital planning now provided is the key improvement noted in his division.

"The graphic representation of that information in T.O. INview is the currency we now exchange among divisions," he says.



The Toronto water main replacement crew includes, from left, Adam Black, Mike Berube, Jim Black, Terry Thompson and Tim Brinnan with the Kubota mini excavator KX 1275. All work for subcontractor Co-X-Co Construction Ltd.

Condition assessment critical

While T.O. INview can provide early warning of future work planned by one division that may have implications for another, moving forward on those projects requires accurate assessment of infrastructure. However, road conditions, for example, are easier to assess than the condition of underground assets and that currently allows road work to be planned with greater certainty than sewer and water work.

"We didn't exactly know which projects would come into the fold and that put pressure on us to perform more complete underground assessment," says D'Andrea. "When Transportation Services expresses an interest in reconstructing a road, we need to perform an underground condition assessment in that area of water, sewer and stormwater systems. It's laborious, especially on the sewer side, because we need to send in a CCTV contractor to deliver a visual inspection record to our offices to determine the condition of the pipe and how much time we have before we need to intervene. If the work required is urgent, we might choose to use trenchless technologies instead of dig-and-replace. If we can wait for the road work, or the road work schedule is advanced to meet our needs, then we can dig and road reinstatement costs won't be a factor."

Road construction planning is also benefiting from Toronto Water's basement flooding abatement program.

"We're literally breaking up communities to shoehorn in new drainage systems, so it stands to reason that Transportation Services may want to take a hard-nosed look at the condition of those roads and advance their reconstruction schedule," says D'Andrea. "However, it's a balancing act between budgets and needs. We'd love to rip out all of the old infrastructure every time a road is opened, but we still need to be mindful of the funds we can devote to that. What happens if the budget as forecast today doesn't materialize? Or what if a project is deferred, and the budget isn't there for the division the following year?"

> **"We can now differentiate between water main replacement, water main rehabilitation, transmission water main work, water service replacement, sewer replacement, sewer rehabilitation, stormwater management projects and basement flooding protection. Zooming in on a particular street will allow the user to access specific project details."**
>
> **Jeffrey Climans**

T.O. INview continues to expand the scope of capital work covered to additional city divisions and other external programs. The version of the software now under development is designed to provide a rolling five-year capital construction schedule and is expected to be available to city staff and external partners in 2013.

One current feature of the system initially created some trepidation among staff members, notes D'Andrea.

"By hovering the cursor over a particular project, users can see the name of the project manager assigned to a sewer or water project and their telephone number," he says. "They can also click on the box and email that person directly. Initially, staff members were worried that they would be swamped with calls or emails, but that hasn't turned out to be the case. We can provide this sort of transparency without compromising their workload." ✦

PUMPER & CLEANER ENVIRONMENTAL EXPO INTERNATIONAL

FEBRUARY 25–28, 2013

INDIANA CONVENTION CENTER • INDIANAPOLIS, IN

2013 EXHIBITOR LIST

Current as of Dec. 5, 2012.
List subject to change.

27th Trucks, Inc.
A.R. North America
ABBA Pump Parts & Service
Abbott Rubber Company, Inc.
ACE DuraFlo Systems
Acro Trailer
Admirals Bank
Advance Pump & Equipment
Advanced Containment Systems Inc.
Advanced Drainage Systems
Advanced Pressure Systems
Advantage Funding
Aero-Tech
Air-Weigh Scales
AK Industries Inc.
All Star Sewer Equipment
Allan J. Coleman
Allied Forward Motion LLC
Allied Graphics
Allied Tank Co.
AllMax Software, Inc.
Alpine Equipment Funding, Inc..
Alteris-SeptiCover
AlturnaMATS, Inc.
Ameri-Can Engineering
American Express OPEN
AMerik Engineering
Amthor International
Anua
AP/M Permaform
Aqua Mole Technologies
AquaOnDemand Solutions by Aqua-Aerobic Systems, Inc.
AquaSoles
AQUA-Zyme Disposal Systems, Inc.
Arcan Enterprises Inc.
Aries Industries Inc.
Armal, Inc.
Art Co. LLC
Arthur Products
Ashbrook Simon-Hartley
Ashland Pump
Ashland Trap Distribution, Co.
Atlanta Rubber & Hydraulics Inc.
Avanti International
B.A.G. Corp
Bad Dog Tools
BakerCorp
Bandlock-Amesbury
Banjo Corp.
Barnett
BDP Industries
Bear Onsite
Benlee, Inc.
Best Enterprises Inc.
Betts Industries
Biffs Pathfinders, LLC
Bio Clean
Bio-Microbics Inc.
Black Tie Products
Blasters, Inc.
Blood Hound Underground
Blue Angel Pumps
Boerger LLC
Bowman Tool Co.
Brenlin Co., Inc.
Bright Dyes
Bright Technologies
BRUDON Air Vac / Kay International
Bulk Toilet Paper
Bull Frog Industries LLC
BW Technologies by Honeywell/Honeywell Analytics
Cam Spray
Canplas LLC.
Cape Cod Biochemical Co.
CAT PUMPS®
CEMTEC / A.W. Cook Cement Products
Century Chemical Corporation
Champion Pump Company, Inc.
Chandler Equipment Inc.
Chelsea Products/Div. of Parker
Chempace Corporation
Chempure Products Corp.
Cherne Industries Inc.
CIPP Services, LLC
Clarus Environmental/Zoeller Pump Company
Clear Computing
Clearstream Wastewater Systems Inc.
Cloverleaf Tool Co.
COB Industries, Inc.
Cobra Technologies
COLE Publishing
Comet USA, Inc.
Comforts of Home
Compulink Cable Assemblies, Inc.
Coneqtec Universal
Containment Solutions, Inc.
Control Chief
COXREELS
Crescent Tank Manufacturing
Cretex Specialty Products
Crust Busters/Schmitz Bros.
CST Storage
C-Tec
CUES
Cusco
Custom Biologicals, Inc.
De Neef Construction Chemicals
Del Vel Chemical Co.
Delphin Water Systems of America, Inc
Delta Environmental
Ditch Witch
Downey Ridge Environmental Company
Dragon Products
Draincables Direct
Dultmeier Sales
Duracable Manufacturing
Dyna Flex Inc
Dynamic Decals & Graphics, Inc.
E Z Onsite
E&B Green Solutions
E.H. Wachs
Easy Liner
Ecological Laboratories Inc.
Electric Eel Mfg. Co. Inc.
EleMech, Inc.
Eljen Corporation
Envirologics
Environment One Corporation
Envirosight LLC
Envirotub
Enz USA Inc.
Epps Products
E-Tank, Ltd./ E-Pump
Explorer Trailers
EZTrakR
Fabco Automotive Corp.
Federal Signal Environmental Solutions Group
Fergus Power Pump Inc.
Fisher Research Laboratory
Five Peaks Technology
FKC Co. Ltd.
Flint Industries
Flitz International Ltd.
Flo Trend Systems Inc.
Flow-Liner Systems
Flygt, a Xylem Brand
Forbest Products Co.
Foremost Industries LP
Forest River, Inc.
FORMADRAIN Inc.
Fournier Industries Inc.
Franklin Electric / Little Giant Engineered Products
Fruitland Tool & Manufacturing
FW Murphy
GapVax Inc.
Gardner Denver Water Jetting Systems Inc.
Gardner Denver Wittig
GE Oil & Gas - Roots Blowers
GEA Farm Technologies Inc.
General Pipe Cleaners/General Wire Spring Co.
General Pump
Geoflow, Inc.
GfG Instrumentation, Inc.
Giant Industries Inc.
Glentronics, Inc. / PHCC Pro Series Pumps
Global Pipeline Systems
Go For Digger
Godwin, a Xylem Brand
Goldak Inc.
Gorlitz Sewer & Drain, Inc.
Gorman-Rupp Co.
GPK Products, Inc.
GPM Pump & Truck Parts, LLC
Granite State Collectibles
Green Leaf Inc.
Hackney / Isuzu Trucks
Hadronex
Hammelmann Corp.
HammerHead Trenchless Equipment
Hannay Reels Inc
Harben Inc.
Hathorn Corporation
HCP Pumps of America
Hedstrom Plastics
Heffernan Insurance Brokers
Helix Laboratories Inc.
Hibon, Inc./Div. of Ingersoll Rand
Hino Motor Sales U.S.A., Inc.
Hi-Vac Corporation
Hot Jet USA
Hurco Technologies Inc.
Hydra-Tech Pumps
Imperial Industries Inc.
In The Round Dewatering
Indiana Onsite Wastewater Professionals Association
Infiltrator Systems Inc.
Infrastructure Repair Systems, Inc.
Infrastructure Technologies
Infratech
Inland Pipe Rehabilitation (IPR)
Innovative Hydrovac Trucks LLC
InSight USA - StreetEagle GPS Tracking
Insight Vision
International Thermal Research
ITI Trailers & Truck Bodies Inc
J&J Chemical Co.
Jack Doheny Supplies Inc.
JAG Mobile Solutions
Jameson LLC
Jet Inc.
Jetter Depot
Joe Johnson Equipment, Inc.
Johnny's Choice by Chempcorp Industries Inc.
Kar-Tech, Inc.
KEG Technologies, Inc.
Keith Huber, Inc.
Kentucky Tank, Inc.
KM Specialty Pumps & Systems, Inc.
Kroy Industries
Kuriyama of America, Inc.
L.M.T. Inc.
La Place Equipment Co Inc.
Lansas Products Mfg by Vanderlans and Sons
Ledcor
Lely Manufacturing
Lenzyme Incorporated
Liberty Financial Group, Inc.
Liberty Pumps
Liquid Environmental Solutions
Liquid Waste Industries, Inc.
Liquid Waste Technology
LMK Technologies, Inc.
Lock America
Lodar
Logan Clutch Corporation
Logiball Inc.
Longhorn Tank & Trailer
M.A.R.S. Workwear/Communications
Madewell Products Corp.
Mainline Backflow Products, Inc.
Masport Incorporated
Masterliner, Inc.
Max-Life Mfg.
MaxLiner USA
Merrell Bros., Inc.
Mersino / Global Pump
Mid-State Tank Co., Inc.
Miller Pipeline
Milwaukee Rubber Products Inc.
Mody Pumps, Inc.
Money In Motion
Moro USA
Mr. Rooter Corp.
MTC
MTech
Muncie Power Products
Myers
MyTana Mfg. Company Inc.
NAMCO Machine & Gear Works Ltd.
National Environmental Health Association
National Vacuum Equipment
Nationwide Sales & Service Inc.
Nature Calls
NAWT, Inc.
NBB Controls
Neron Pumps
Netafim USA
Nexstar
NILodor Inc.
NLB Corp.
Norweco Inc.
NOWRA
NovaFlex Hose
NozzTeq, Inc.
NSF International
Nu Flow
Nuhn Industries Ltd.
Oceanquip, LLC
Ohio Electric Control, Inc.
OMI Industries
OmniSite
OMSI Transmissions, Inc.
One Biotechnology
Orenco Systems, Inc.
PA SpA
Paragon Tools Manufacturing Co., Ltd.
Parson Environmental Products Inc.
Patriot Pumps
Pat's Pump & Blower
Pearpoint / SPX
Peinemann Equipment
Pelican Worldwide
Pentair Water
People's United Equipment Finance Corp.
Perma-Liner Industries Inc.
Petersen Products
Phoenix USA Inc.
Piccadilly Concepts
Picote Oy Ltd
Pik Rite Inc.
Pipe Lining Supply, Inc.
PipeHunter
Pipeline Analytics
Pipeline Renewal Technologies
PipeLogix Inc.
PipeTech Software
Piranha Hose Products
Point of Rental Systems
Poly-Flow
PolyJohn Enterprises Corp.
Polylok/Zabel
PolyPortables Inc.
Porta Pro Chemical Company
Portable Sanitation Assoc. Int L
Powertrack International Inc.
PPE Rentals
PPG Industries, Inc.
Premier Oilfield Equipment Co.
Premier Tech Aqua
Presby Environmental, Inc.
Presvac Systems, Ltd.
Prime Resins, Inc.
Prime Solution, Inc.
PrimeLine Products
Progress Tank
Pronal-USA, Inc.
Protective Liner Systems
Prototek
PUMPTEC
Quadex Inc.
Quik-Lining Systems, Inc.
Rabco
Rain for Rent
RapidView IBAK North America
Ratech Electronics, Ltd.
Rausch Electronics USA LLC
RC Industries Inc.
REED Manufacturing Company
Reekcraft Industries Inc.
Reline America Inc.
Rich Restrooms
RIDGID
RID-X® Septic System Treatment
Ring-O-Matic
Ritam Technologies, LLC
Robinson Vacuum Tanks, Inc.
Robuschi & C.S.p.A.
RODDIE Inc.
Roebic Laboratories, Inc.
RootX Inc.
Roth Global Plastics
ROTHENBERGER USA
Roto-Rooter Corporation
RotoSolutions
RouteOptix Inc.
RS Technical Services Inc.
Rush Refuse Systems
RVI Pro, Inc.
Sabre Manufacturing
SAERTEX multiCom LP
Safety Corporation of America
Safety Sewer Drain
Salcor, Inc.
Satellite Industries Inc.
Sauereisen, Inc.
Savatech Corp.
Schieffer Co. International L.C
ScreenTech Imaging, a div. of Roeda Signs Inc.
Sealing Systems Inc.
Sekisui SPR Americas, LLC
Sensors & Software Inc.
Septic Drainer/Municipal Sales, Inc.
Septic Pages
Septic Products Inc.
Septic Services Inc.
Septronics
Service Roundtable
Service Squared
ServiceTitan
Sewer Equipment Co. of America
Sewer Pages
Sewer Seal Technologies, LLC
Shark Pressure Washers & Jetters
ShuBee
SIM/TECH Filter Inc.
SJE-Rhombus
SludgeHammer Group Limited
Soft-Pak
Southland Tool Mfg. Inc.
Spartan Tool LLC
Specialty B Sales
SPIR STAR
STAC, Inc.
Stamp Works
Standard Cement Materials, Inc.
Standard Equipment
Sto-Away Power Cranes Inc.
StoneAge, Inc.
Sturgeon Tank & Equipment
Subsurface Instruments
Super Products LLC
Superior Signal Company LLC
Supervac 2000
Surco Products Inc.
Surpresseur 4S Inc.
SVE Portable Roadway Systems, Inc.
T & T Tools Inc.
TCF Equipment Finance
Terydon Inc.
The Hartford
The Strong Company
Thermaco, Inc. - Trapzilla
Thieman Tailgates, Inc.
Thompson Pump
Topp Industries, Inc.
Tracker Solutions
Trade-Serv
Trans Lease, Inc.
Transway Systems Inc.
Trelleborg Pipe Seals
Trenchless Technology Magazine
TRIC Tools Inc.
Trillium Environmental Services
TRY TEK Machine Works, Inc.
TSE International / OK Champion
TSF Co. Inc.
TT Technologies Inc.
Tuf-Tite Inc.
Turbo-Fog, Division of Kingscote Chemicals
Tuthill
U.E.M.S.I.
Udor USA
Under Pressure Systems, Inc.
US Fleet Tracking
US Jetting, LLC
USA BlueBook
USB-Sewer Equipment Corporation
VAC2GO
Vacall
Vac-Con Inc.
Vacutrux Limited
Vacuum Truck Rental
Vaporooter
VAR Co.
Vermeer
VIP Sanitation
Vivax Corp.
Vogelsang
Walex Products Co.
Wallenstein Vacuum Pumps
Wastequip
WasteWater Education 501(c)3
Water Environment Federation
Weber Industries, Inc. (Webtrol)
Wee Engineer Inc.
Wells Cargo Ultralav Mobile Restrooms
Wells Fargo Equipment Finance, Inc.
Western Equipment Finance
Western Mule Cranes
Westmoor Ltd.
Wieser Concrete Products Inc
WJTA-IMCA
Wohler USA
Xylem, Dewatering Solutions
Yodle
Zhejiang Danau Industries Co., Ltd.

EDUCATION DAY SEMINARS

MONDAY FEBRUARY 25TH

NAWT — National Association of Wastewater Technicians

8 a.m.	Introduction to Pressure Distribution
9:30 a.m.	Designing Systems, Boundaries and Barriers from a Soils Perspective
11 a.m.	Pump Choices and Settings: Decisions for Proper Operation
1:30 p.m.	Operation and Maintenance of Pressure Distribution Laterals
3 p.m.	Installing with Management in Mind: How to Get the Most out of Your System
4:30 p.m.	Design and Maintenance of Grease Interceptors

SSCSC — Southern Section Collection Systems Committee

8 a.m.	Seven Powerful Tools for CCTV Inspection Perfection
9:30 a.m.	Easements – A Collection System Maintenance Nightmare
11 a.m.	Nozzle Science – The Next Generation of Tier 3 Nozzles and Beyond
1:30 p.m.	Pass or Fail – Is Your Company Going To Make It? How to Ensure Success
3 p.m.	Social Media and Web-Based Promotion: Is it Right for Your Business?
4:30 p.m.	Pipeline Relining and Rehabilitation Solutions

NOWRA — National Onsite Wastewater Recycling Association

8 a.m.	Time Dosing . . . Why? How? And How Much?
9:30 a.m.	Loading Rates – How Much Can the Soil Take?
11 a.m.	Troubleshooting Pumps, Floats and Panels
1:30 p.m.	The Dirty Dozen – Toxins That Kill Septics
3 p.m.	How Installers Can Use the Poor Economy to Increase Profits
4:30 p.m.	Are Seepage Pits Really Bad?

NOWRA Room 2

8 a.m.	Designing Drip Dispersal Systems
9:30 a.m.	Soil Erosion Control During and After Septic System Installation
11 a.m.	Decentralized Wastewater Collection System Maintenance

NEXSTAR — Independent Residential Service Contractors Association

1:30 p.m.	The Art and Science of Business Management
3 p.m.	The Business of Contracting

NEHA — National Environmental Health Association

8 a.m.	What Makes a Professional in Onsite Wastewater Systems?
9:30 a.m.	Part One: The Science and Engineering of Onsite Wastewater Treatment
11 a.m.	Part Two: The Science and Engineering of Onsite Wastewater Treatment
1:30 p.m.	Education and Training: Professionalization of the Practitioners
3 p.m.	Management Models: Management and Becoming a Management Entity
4:30 p.m.	The Future of the Onsite Wastewater Industry: How to Make it Work for You!

NASSCO — National Association of Sewer Service Companies

8 a.m.	Ultraviolet Manhole Rehabilitation
9:30 a.m.	Convey Your Stormwater and Plug Your Holes!
11 a.m.	Jet Up! Sewer and Storm Water Cleaning
1:30 p.m.	Rethinking Collection Maintenance with Sewer Line Rapid Assessment Tool or SL-RAT
3 p.m.	Case Study of Cleaning Large Diameter Sanitary Sewers and Siphons
4:30 p.m.	Pipeline Assessment Certification Program (PACP) 2013 Update Workshop

SCOTT HUNTER — Business Coach

8 a.m. - 5:30 p.m.	2013 - Your Best Year Ever

WJTA/IMCA — WaterJet Technology Association

8 a.m.	Safety and Efficiency – You Don't Have to Choose!
9:30 a.m.	Selecting the Best Jetting Tip Doesn't Have to Be Scary
11 a.m.	Hydroexcavation – The Non-Destructive Solution

PHIL STEIN — Vacuum System Information

1:30 p.m.	Understanding the Power: Physics of Vacuum and How it Works

PSAI — Portable Sanitation Association International

4:30 p.m.	GAP: Good Agricultural Practices

DETAILED SESSION INFORMATION AVAILABLE AT:

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PUMPER & CLEANER ENVIRONMENTAL EXPO INTERNATIONAL

FEBRUARY 25–28, 2013

INDIANA CONVENTION CENTER • INDIANAPOLIS, IN

TUESDAY TRACKS

FEBRUARY 26TH, 2013

TRANSPORTATION AND LAND APPLICATION

8 a.m.	Driver Compliance and Certification: How to Meet DOT Requirements
9:30 a.m.	Staying in Compliance with 503 Regulations for Land Application
11 a.m.	Land Application: Case Study of a Long-Term Operation

INDUSTRY SAFETY

8 a.m.	One Piece Nozzles Enhance Performance and Safety
9:30 a.m.	Confined Space Entry Permit and Equipment Review
11 a.m.	Utility Line Locating

SSCSC

8 a.m.	Making Emergency Response Your Business
9:30 a.m.	How to Protect and Maintain Sewer Hose From Mini Jetters to Combination Units
11 a.m.	How to be Successful in the Cleaning/CCTV Business

GENERAL BUSINESS

8 a.m.	New Untapped Techniques to Capture Today's Customers
9:30 a.m.	10 Steps to Marketing Success
11 a.m.	Cloud Computing for Small Business and the Field Service Industry

Business Room 2

8 a.m.	Don't Win the Price Game
9:30 a.m.	Make the Phone Ring with Low-Cost Marketing
11 a.m.	Local Marketing on the World Wide Web

SEWER COLLECTION & REHABILITATION

8 a.m.	Chemical Grouts and Grouting Methods
9:30 a.m.	Watch Your Assets – Remote Monitoring Can Save You Big Bucks
11 a.m.	Lateral Connection Rehabilitation: Biggest Bang for the Rehabilitation Buck

SPANISH/ESPANOL

8 a.m.	Floods in Mexico City
9:30 a.m.	Best Practices for Working in Confined Spaces
11 a.m.	How to Overcome the Difficulties of Doing Business in South America

WEDNESDAY TRACKS

FEBRUARY 27TH, 2013

SEWER COLLECTION & REHABILITATION

8 a.m.	Cash for Compliance: The New Boom in Home Sewer Replacement
9:30 a.m.	Trenchless Point Repairs, a Low Cost Permanent Solution
11 a.m.	Penn State University Performs Manhole-to-Manhole Lining In-House

GAS, OIL & MINING

8 a.m.	How to Decide What Dewatering Option is Best for You
9:30 a.m.	Blower 101: The Basic Operation of the Positive Displacement Blower
11 a.m.	Principles and Equipment of Hydro-Pneumatic Vacuum Excavation

GENERAL BUSINESS

8 a.m.	Save Money – Move Your Business to the Cloud
9:30 a.m.	Morally Bankrupt
11 a.m.	Measuring Success Matters: Your Ads, Your Agents, Your Technicians

MUNICIPAL

8 a.m.	Benefits of Digital Side Scanning Inspection Camera Systems
9:30 a.m.	Application for Sewer and Storm Nozzles
11 a.m.	Grinder Pumps & Application

PORTABLE LIQUID WASTE

8 a.m.	A View from the Receiving End: Regulatory Challenges in FOG Programs
11 a.m.	Now You Smell Me, Now You Don't: Deodorants

NEW TECHNOLOGY

8 a.m.	Improving Safety and Technology with Wireless Technology
9:30 a.m.	New Technology for Locating Sewer Line Leaks
11 a.m.	Solve Decentralized System Malfunction Issues and Site Challenges

ADVANCED INSTALLER COURSE

8 a.m. - 5 p.m.

Onsite Installer Certified Professional

Presenters: Jim Anderson and Dave Gustafson
Sponsored by Onsite Installer and COLE Publishing
An all-day course detailing site planning and preparation

NETWORKING & ENTERTAINMENT

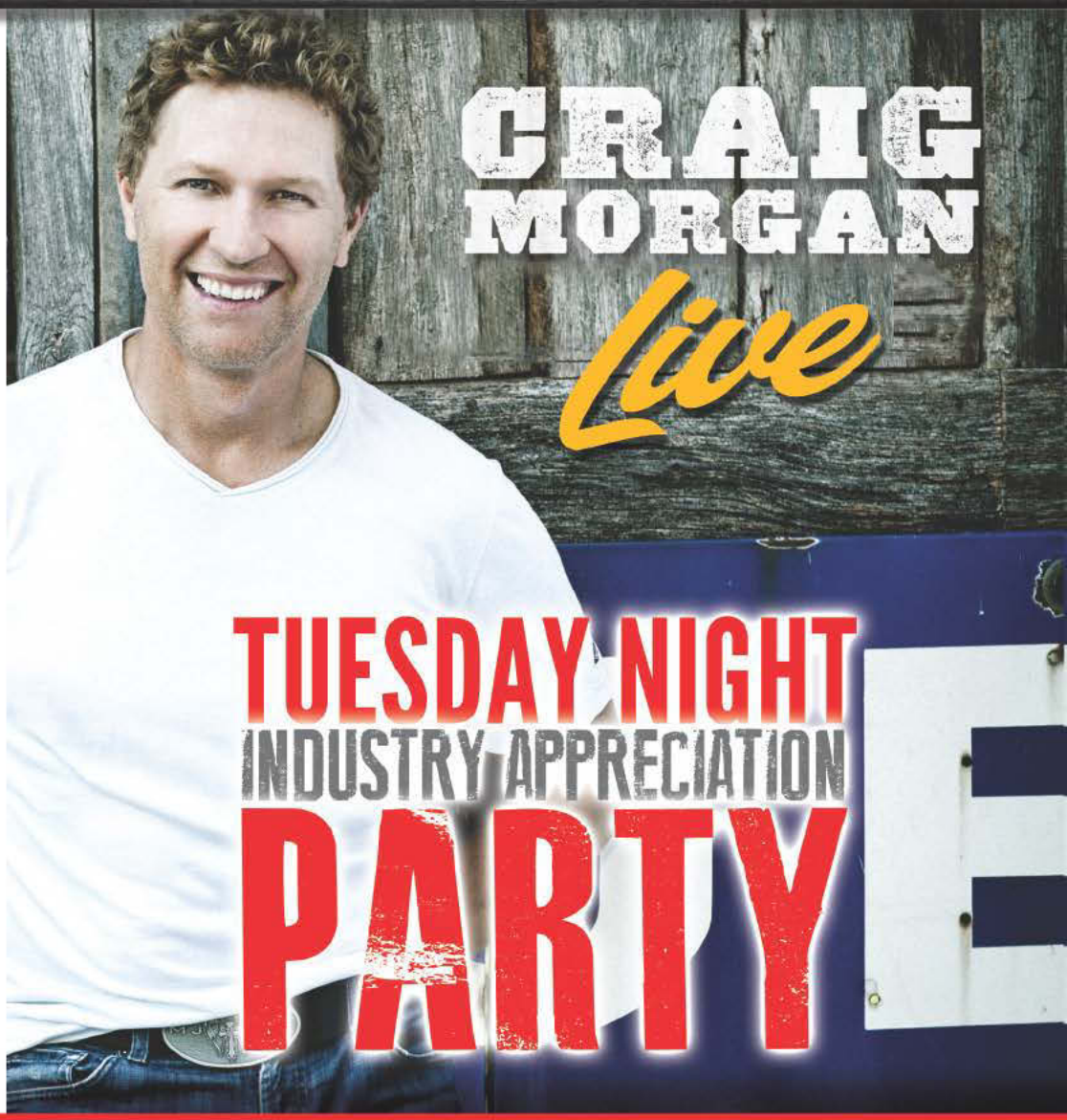
Network with your peers over a 25¢ tap beer and enjoy a private concert just for Pumper & Cleaner Expo attendees! The Tuesday Night Industry Appreciation Party is a must attend Expo event and it's included when you pre-register before January 25th, 2013!

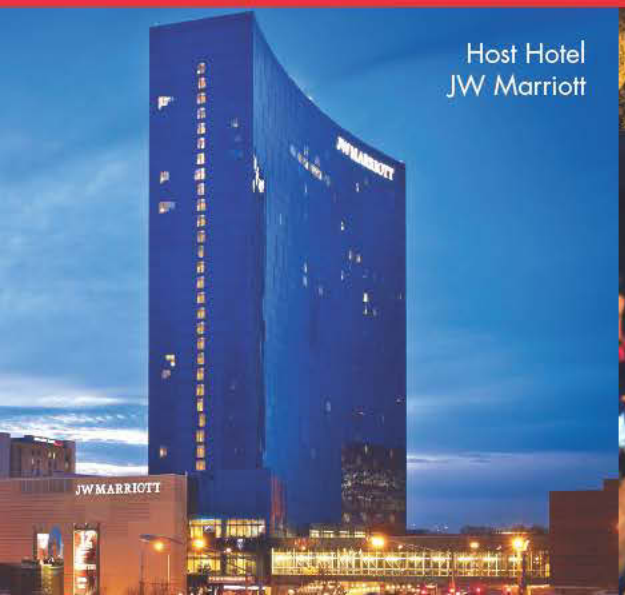
Tuesday, February 26th

Doors Open: . . . . . 4 p.m.
25¢ Tap Beer:. . . . 5 - 7 p.m.
Craig Morgan: . . . 7 p.m.

JW Marriott Hotel

3rd Floor • Grand Ballroom





Host Hotel
JW Marriott

Attendees enjoying the live concert at last year's event

STORMWATER MANAGEMENT MAGIC

StormGenie Version 2.0 provides fast and accurate designs for systems using CULTEC-manufactured components

By Erik Gunn

Designing drainage systems to collect, hold and disperse stormwater, whether on private property or as part of a larger municipal stormwater sewer system, can be a complicated task. A system may have a variety of different components, each with specific sizes that must be arranged in a particular configuration suitable for the volume of water and the shape of the site to be developed.

CULTEC, Inc., a manufacturer of stormwater system components based in Brookfield, Conn., offers StormGenie for contractors and other customers who design and sell the company's systems. The free AutoCAD plug-in quickly and accurately creates detailed stormwater system designs using CULTEC components.

Gina Carolan, CULTEC chief operations officer, and Alicia Messina, CULTEC technical department supervisor, demonstrated the newest edition, Version 2.0, released in September, over the Internet on Sept. 26, 2012.

For simplicity, the demonstration focused on a storm drainage system for a single private home. A larger commercial use was also shown to demonstrate the application's additional capabilities. The same design procedures and operations, however, could be used for developing systems on sites or for developing individual segments of a municipal stormwater system, Carolan said.

> **"It's good for preliminary design, but if they wanted to, the user could then take those preliminary designs and make them more site specific. It's fully able to be modified once the drawing is created."**
>
> **Gina Carolan**

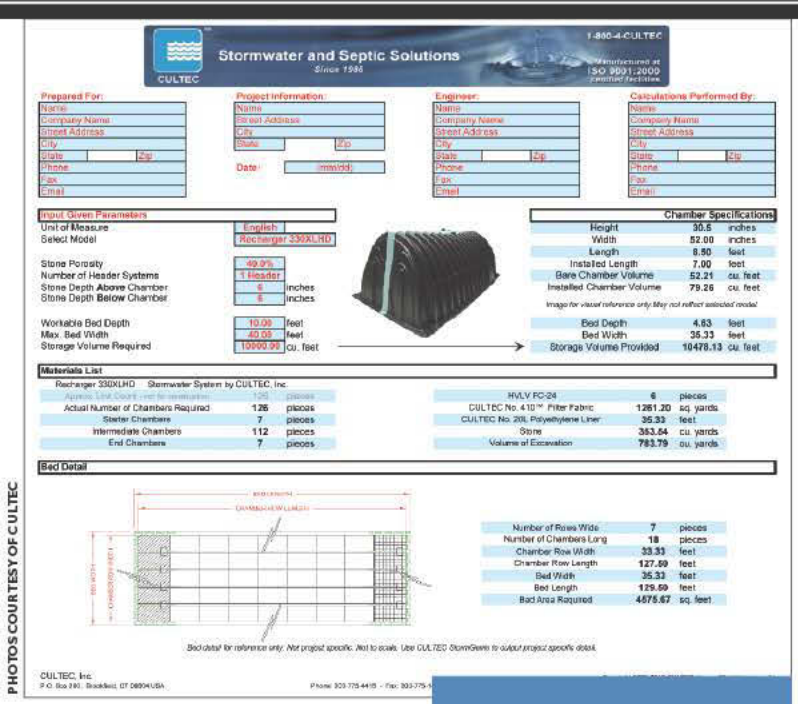
Walk-around

A StormGenie user begins with the calculator, a customized spreadsheet program that includes specs for various CULTEC storm drainage chamber product lines. The user enters data pertaining to the proposed stormwater bed, and the calculator generates a complete set of specifications and a materials list based on the product line chosen for the site. The spreadsheet employs a user-friendly form that is easy to read and follow. Users have the option of entering data in English units (distance in feet and inches; volumes of water runoff in cubic feet) or metric units (meters, centimeters, liters of water, and so on). All information is saved in a Microsoft Excel file.

The StormGenie plug-in then allows the user to bring the resulting bed design into AutoCAD so it can be integrated with the overall building site design. The user can make adjustments to the bed design to suit specific site dimensions.

For a stormwater system that includes more than one bed, each bed is created separately. For example, if a site plan calls for three separate stormwater beds on the property to handle the total projected volume of runoff from the entire site, each bed would be designed separately according to its desired and appropriate dimensions and volume.

The application uses conventional Microsoft Windows-based keyboard and mouse input techniques.



PHOTOS COURTESY OF CULTEC

StormGenie creates its designs based on calculations from information provided through the data entry screen.

TECHNOLOGY TEST DRIVE

EQUIPMENT:
StormGenie v. 2.0 AutoCAD plug-in for stormwater management system design

MANUFACTURER:
CULTEC Inc.
800/428-5832
www.cultec.com

LOCATION OF DEMO:
Remote via GoToMeeting

DEMONSTRATED BY:
Gina Carolan, CULTEC chief operations officer and Alicia Messina, CULTEC technical department supervisor

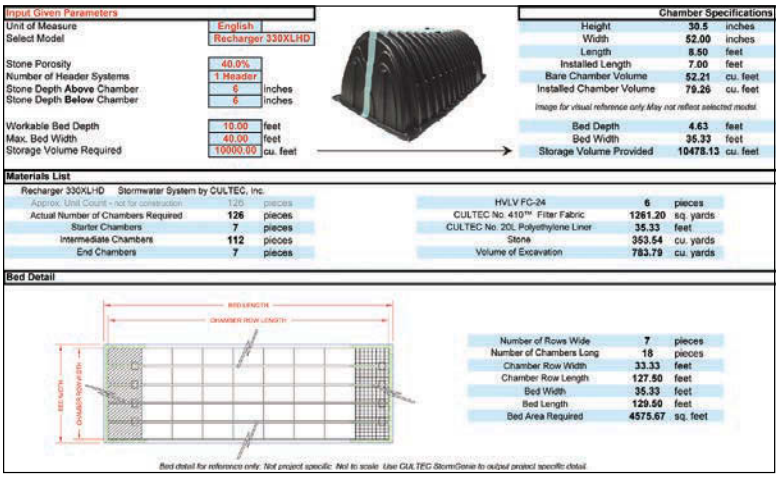
LIST PRICE AS DEMONSTRATED:
Free to contractors and designers using CULTEC stormwater management products

Operation

The demonstration began with a basic review of the calculator's operations.

Carolan opened the program to the calculator's data entry screen and chose the Recharger 330XLHD as the CULTEC product to use in the design.

Fields lettered in red can be modified by the user. Fields in black generate a list of specific compo-



Input Given Peremeters		
Unit of Measure	English	
Select Model	Recharger 330XLHD	
Stone Porosity	40.0%	
Number of Header Systems	1 Header	
Stone Depth Above Chamber	6	inches
Stone Depth Below Chamber	6	inches
Workable Bed Depth	10.00	feet
Max. Bed Width	40.00	feet
Storage Volume Required	10000.00	cu. feet

Chamber Specifications		
Height	30.5	inches
Width	52.00	inches
Length	8.50	feet
Installed Length	7.00	feet
Bare Chamber Volume	52.21	cu. feet
Installed Chamber Volume	79.26	cu. feet
Bed Depth	4.63	feet
Bed Width	35.33	feet
Storage Volume Provided	10478.13	cu. feet

Image for visual reference only. May not reflect selected model.

Materials List

Recharger 330XLHD Stormwater System by CULTEC, Inc.

Approx. Unit Count - not for construction	125	pieces
Actual Number of Chambers Required	126	pieces
Starter Chambers	7	pieces
Intermediate Chambers	112	pieces
End Chambers	7	pieces

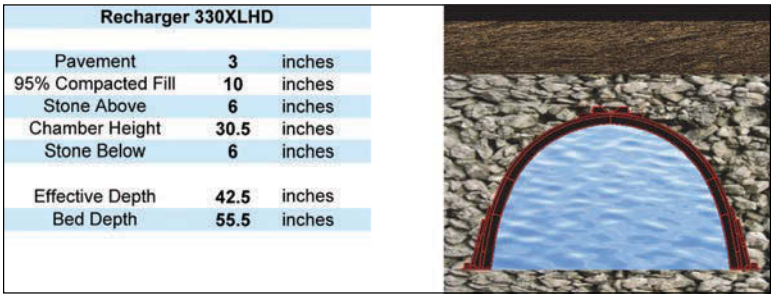
HVLV FC-24	6	pieces
CULTEC No. 410™ Filter Fabric	1261.20	sq. yards
CULTEC No. 20L Polyethylene Liner	35.33	feet
Stone	353.54	cu. yards
Volume of Excavation	783.79	cu. yards

Bed Detail

Number of Rows Wide	7	pieces
Number of Chambers Long	18	pieces
Chamber Row Width	33.33	feet
Chamber Row Length	127.50	feet
Bed Width	35.33	feet
Bed Length	129.50	feet
Bed Area Required	4575.67	sq. feet

Bed detail for reference only. Not project specific. Not to scale. Use CULTEC StormGenie to output project specific detail.

Based on data entered for the stormwater bed specifications (product line, maximum bed width, and needed system capacity in cubic feet of water), the calculator creates a list of the number of chambers, details of the bed, and total materials list.



Recharger 330XLHD		
Pavement	3	inches
95% Compacted Fill	10	inches
Stone Above	6	inches
Chamber Height	30.5	inches
Stone Below	6	inches
Effective Depth	42.5	inches
Bed Depth	55.5	inches

A stylized cross section of the chamber design embedded in stone gives a visual cue as to alternative depths of stone.

nent materials for the project based on calculations from user-entered information.

Carolan entered a series of site specifications to show the calculator's operation. She chose a configuration that included one header unit because the design was for a retention system instead of a detention system.

She chose a workable bed depth of 10 feet. Workable bed depth reflects the limitations of the land itself, such as bedrock or a high groundwater table that may limit how far down the bed can be installed. Each product line has minimum requirements for workable bed depth, and a bubble dialogue offered a general reminder on minimum workable bed depth information for the CULTEC product lines.

To show what happens when the user enters specifications outside the minimum requirements of the selected product, she changed the workable bed depth to 4 feet — too low for that particular chamber model. The materials list fields, which are automatically populated by the calculator, went blank, indicating that the product line was not suitable for the conditions. She changed the workable bed depth back to the 10-foot depth actually allowed by the site, and the materials list fields automatically repopulated.

Because the chambers are normally embedded in uniformly-sized stone that allows for additional stormwater capacity, Carolan also chose a desired stone porosity — in this case 40 percent, which she explained is the standard porosity used in such designs. She also elected to have a 6-inch depth of stone above and below each chamber. More stone depth above a chamber allows for greater storage volume in the bed.

After she selected a maximum bed width of 40 feet and a volume of water to be contained of 10,000 cubic feet, the StormGenie spreadsheet populated fields showing dimension specifications for each chamber, the details of the total bed and the total materials list. "The actual bed width specified will always be below the maximum bed width you enter," Carolan explained.

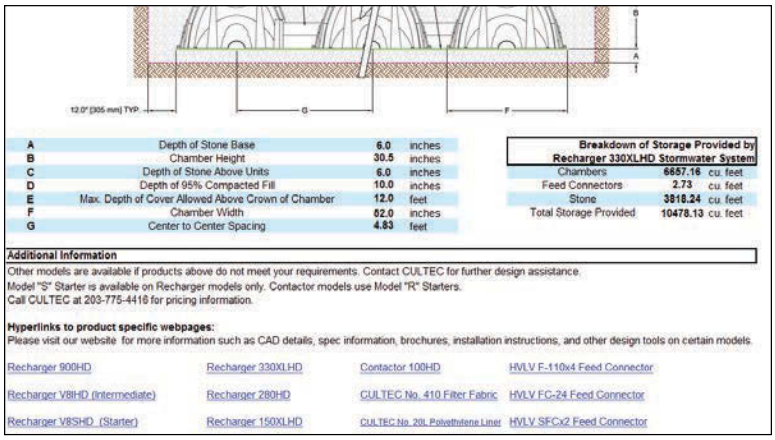
Fields indicated the volume of water to be contained in each chamber by itself (bare chamber volume) and when combined with the stone surrounding the chamber (installed chamber volume).

A graphic feature allows the user to visualize how the chamber's position and other specifications of the unit bed will change depending on the depth of stone. When Carolan changed the stone depth, a stylized cross section image of the design reflected the adjustment. The installed chamber volume also changed accordingly.

The calculator also showed a table that specified how storage was allocated among the chambers, the stone and connectors in the system. Hyperlinks below that take the user to downloadable PDF and CAD files for each individual CULTEC drainage product or product line. That feature allows the designer to attach those files to the final plan, Carolan explained, although a live Internet connection is required.

The entire series of tables, sub-tables and other information fields produced by the calculator appear in a single comprehensive screen view, so each item can be easily found by scrolling up or down rather than having to open different windows or pages.

Having shown the details of the calculator program, Carolan changed some of the inputs to reflect a simple bed design for a single-family home site. For this design, the bed was to be located under a patio and could be no wider than 16 feet and would have to accommodate a total volume of 1,000 cubic feet of stormwater. Once those and other specifications were changed, the calculator generated a new basic array and materials list, creating a bed plan that was three chambers wide by four chambers long — dictated by the combination of the product line chosen and the depth, width and desired volume for the system. She saved the completed data sheet as an Excel file that would become a template for StormGenie in AutoCAD.



A	Depth of Stone Base	6.0	inches
B	Chamber Height	30.5	inches
C	Depth of Stone Above Units	6.0	inches
D	Depth of 95% Compacted Fill	10.0	inches
E	Max. Depth of Cover Allowed Above Crown of Chamber	12.0	feet
F	Chamber Width	52.0	inches
G	Center to Center Spacing	4.83	feet

Breakdown of Storage Provided by Recharger 330XLHD Stormwater System		
Chambers	6857.16	cu. feet
Feed Connectors	2.73	cu. feet
Stone	3618.24	cu. feet
Total Storage Provided	10478.13	cu. feet

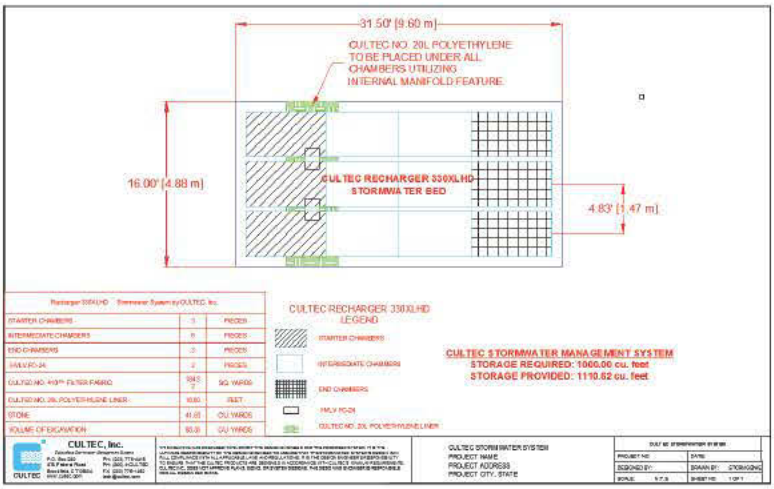
Additional Information

Other models are available if products above do not meet your requirements. Contact CULTEC for further design assistance.
Model "S" Starter is available on Recharger models only. Contactor models use Model "R" Starters.
Call CULTEC at 203-775-4416 for pricing information.

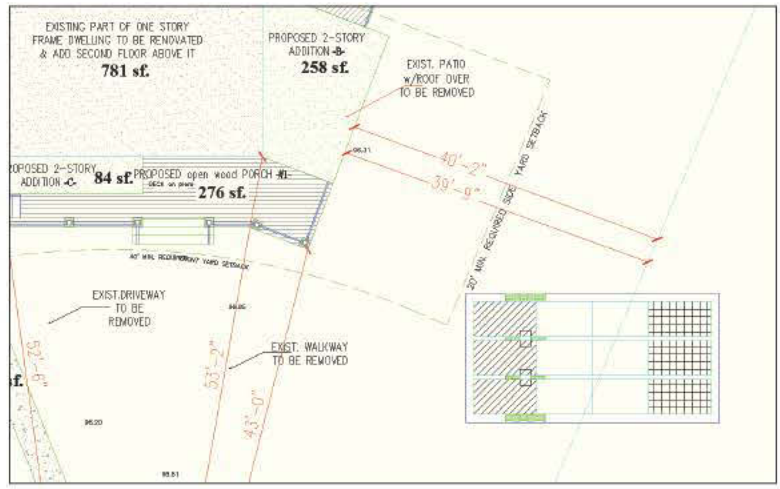
Hyperlinks to product specific webpages:
Please visit our website for more information such as CAD details, spec information, brochures, installation instructions, and other design tools on certain models.

Recharger 900HD	Recharger 330XLHD	Contactor 100HD	HVLV F-110x4 Feed Connector
Recharger V8IHD (Intermediate)	Recharger 280HD	CULTEC No. 410 Filter Fabric	HVLV FC-24 Feed Connector
Recharger V8SHD (Starter)	Recharger 150XLHD	CULTEC No. 20L Polyethylene Liner	HVLV SFCx2 Feed Connector

A table shows how storage is allocated among the chambers, the stone, and the system connectors when a particular stormwater bed is designed. Hyperlinks below that take the user to downloadable PDF and CAD files for each individual CULTEC drainage product or product line.



Once the calculator has completed its work, the data is imported into the StormGenie plug-in in AutoCAD. First a basic sketch is created and cleaned up; it includes the materials list in the lower left corner of the image.



The sketch is then copied and pasted into the home site plan, where it is resized to match the plan's scale.

Carolan opened up a home site plan drawing in AutoCAD. She browsed to the template she had just saved and clicked on it. StormGenie imported the data into a blank screen, creating a basic sketch of the bed that included the materials list in the lower left corner. After resizing and moving text boxes pertaining to the sketch for a neater appearance, she used the mouse to select and copy the sketch, then paste it into the site plan, where she resized it to match the plan's scale. She then quickly maneuvered it into place on the plan.

The resulting drawing, Carolan pointed out, showed the individual chambers in proper proportion and size for the site, and provided a contractor with far more details on the entire stormwater bed.

Carolan said the StormGenie sketch drawn from the calculator data always defaults to a rectangular shape. She opened another file to show a stormwater bed that had been designed to fit a triangular parking area for a commercial retail store. After the system created the bed in the standard rectangular shape and she copied the sketch into the site plan and brought it to scale, the elements of the proposed system could be quickly pulled apart in AutoCAD and reconfigured like building blocks or toy bricks to fit the system to the site, she said.

Observer's comments

The StormGenie Version 2.0 looks very simple to use for anyone familiar with the AutoCAD software it supplements. The graphics are clear and easy to read, and the process of creating a particular bed was quick. For the demonstration — which included numerous pauses to explain steps and details, the total time from first data entry to finished drawing with the proposed stormwater bed in place took less than 30 minutes.

Manufacturer's comments

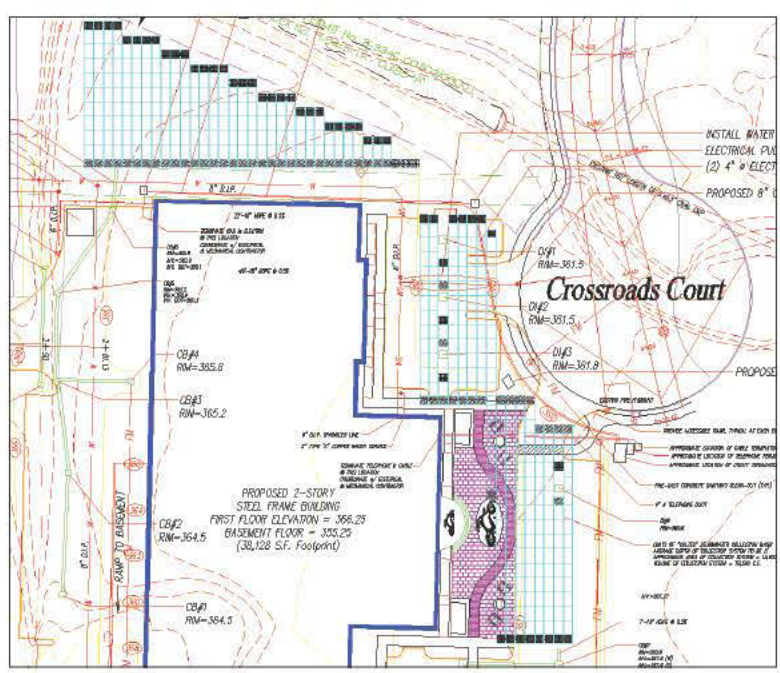
Although the demonstration focused on a very simple project for an individual home site, Carolan said the same principles apply to larger and more complex projects and in designing catch-basin areas or other segments of a municipal stormwater system.

"It's good for preliminary design, but if they wanted to, the user could then take those preliminary designs and make them more site specific," she said. "It's fully able to be modified once the drawing is created."

Carolan said CULTEC offers StormGenie free to its immediate clients — contractors and designers of systems that use the company's products — as a value-added feature that enables them to work more quickly with their customers in preparing designs and installing the CULTEC product line.

It also offers much more detail and precision in measuring components than can be easily created by a designer working without it, she said.

"We're trying to help the designer create systems that are accurate, are easy for takeoff, and let them have a very easy starting point," said Carolan. "We're creating something that is fully engineered and able to be modified." ✦



This screenshot shows three stormwater beds created for a commercial retail store using the StormGenie software. The beds are located in front of the store, to the side of the entryway, and under a triangular section of the landscape between the store and the drive leading to the entryway.

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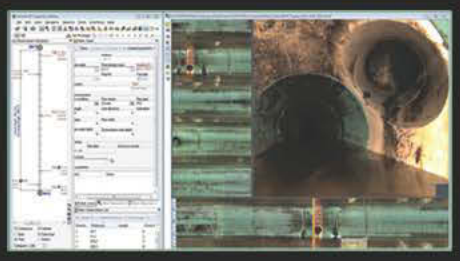

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We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Luke Laggis at 800/257-7222, or email editor@mswmag.com.

HIRING IN THE DIGITAL AGE

Social media has opened new channels for promoting your business and recruiting employees

By Ken Wysocky

Using social media like LinkedIn and Facebook to recruit employees is a lot like that big, button-laden TV remote control in your living room: You know there are a lot of capabilities at your fingertips, but sometimes it's tough to figure out how to use it effectively.

Enter Todd Nilson, the managing director of Social Syntax, a communications-consulting firm in Milwaukee that helps companies integrate social media strategies into their marketing plans and other operations — including employee recruitment.

Nilson says there's no better time to hop aboard the social-media recruiting train. Many already do so; some statistics show that up to 72 percent of recruiters and hiring professionals use LinkedIn (www.linkedin.com) to recruit employees.

"People still use job postings or newspaper ads, but the majority of professional organizations are using online resources like LinkedIn, Facebook and Twitter," he says. "The good news is that (easy) access to good social-networking resources puts small to medium-sized businesses on the same footing as the largest corporations."

Time is money

Social media promotes more efficient time management. Calling colleagues for referrals is fine, but they may not remember names of candidates right away. With LinkedIn, however, recruiters can view first-level contacts and their connections immediately and ask for introductions, Nilson explains.

"Also, people move around a lot these days, and LinkedIn provides a good, easy way to be found," he says. "Plus, it's better than a resume because it can include live endorsements.

"You also can search for specific geographic areas and skills, or look at professional special-interest groups pertinent to the position you're trying to fill," he adds. "Or you can use the LinkedIn 'answers' feature to search for people who have answered questions about a particular topic."

Nilson says Facebook is not as valuable as LinkedIn for recruiting, although organizations can create their own Facebook page and post job openings as well as videos that explain job responsibilities and required skills and experience.

On the other hand, many recruiters use Facebook to screen candidates, even though privacy settings can make that difficult. But beware: The same laws that protect job seekers from discrimination on the basis of things such as race, sexuality and religious affiliation also apply to using social networks for vetting candidates.

Verification is critical

Experts emphasize that recruiters also should realize that, like many things on the Internet, what they see on Facebook may not always be true or up to date. Then there's that little thing called privacy, although people with looser Facebook security settings certainly can't cry foul if a recruiter turns up something unseemly.

"The thing is, it's awfully hard to prove discrimination," Nilson notes. "And, for instance, if a Facebook search reveals that candidate John Smith is into pornography and a company backs off from hiring him … how do they know that John Smith was the same John Smith they were thinking about hiring?"

Nonetheless, a good forensics analyst could build a circumstantial case for discrimination. For example, an investigation could show that a company's human resources person visited a candidate's Facebook profile, then the candidate received a call 24 hours later saying he or she didn't make the cut. Other sites also track visitors, and litigants could subpoena records to build a case, he says.

> **"The good news is that (easy) access to good social-networking resources puts small to medium-sized businesses on the same footing as the largest corporations."**
>
> **Todd Nilson**

"There are scenarios in which it (a discrimination case) could work," Nilson observes. "It's unlikely, but the takeaway here is that employers need to be careful and responsible. Just like with any reference, recruiters need to take things in as a part of the whole."

Tweeting for new employees

Twitter (www.twitter.com), a social media and networking tool in which people "tweet" messages of no more than 140 characters, is also a useful recruiting tool. Recruiters can search for keywords that appear in peoples' "tweets" and then follow those people.

"Say you're looking for a sewer inspector, for example," Nilson says. "I go to a site search on twitter.com and look for a hashtag, which is a way to find keyword topics. I look for all the results of people who use CCTV as a hashtag, and I can 'follow' them, and they don't have to follow me to see that. It's like sending them a message, and asking them if they're looking for a job, or know someone who is. It's a very direct approach."

Employers can enhance their recruiting efforts by using social media to promote their organization as an attractive place to work. They can accomplish this with strong employer branding through a good career page on their website that includes things like video testimonials from employees or photos of fun company or charity events. Moreover, they can magnify their online presence by posting videos on YouTube (www.youtube.com) and photos on Flickr (www.flickr.com).

"You need to increase a company's visibility and the credibility of its website … make it easy for people to find you online," Nilson says. "Just as companies are looking at candidates, candidates are looking at companies and actively researching them." ✦

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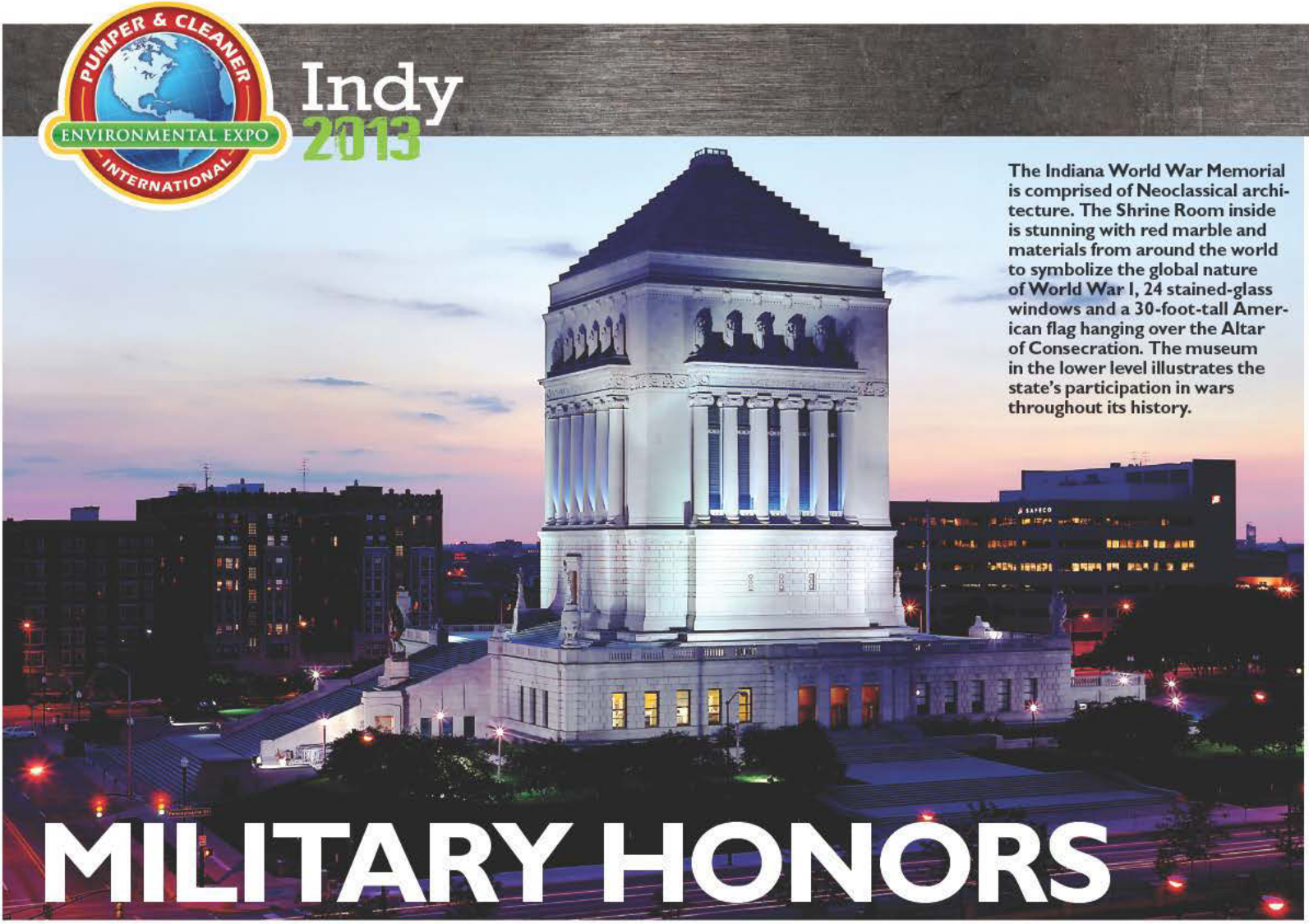

The Indiana World War Memorial is comprised of Neoclassical architecture. The Shrine Room inside is stunning with red marble and materials from around the world to symbolize the global nature of World War I, 24 stained-glass windows and a 30-foot-tall American flag hanging over the Altar of Consecration. The museum in the lower level illustrates the state's participation in wars throughout its history.

PHOTOS COURTESY OF VISIT INDY, WWW.VISITINDY.COM

MILITARY HONORS

Indianapolis has the distinction of being second to Washington, D.C., in building war memorials

By Sharon Verbeten

Indianapolis is more than just the storied Hoosiers and fabled Brickyard of the Indianapolis 500 race, especially when it comes to honoring U.S. veterans.

Washington, D.C., may be considered the cornerstone of veterans' memorials, but Indianapolis easily ranks second. The Indiana War Memorial Plaza Historic District located downtown contains two museums, three parks and 24 acres of monuments, statues, sculptures and fountains, ranking it second nationally in acreage and number of monuments dedicated to veterans. It is also home to the national and state headquarters of the American Legion.

According to Brig. Gen. J. Stewart Goodwin (USAF retired), "There's no other place like this in the country. Indianapolis has more acreage in the nation devoted to veterans." Almost 200,000 visit the memorials each year.

As executive director of the Indiana World War Memorial, Goodwin, a 37-year Air Force veteran, adds, "Indiana has provided, based on population, more service members (in all conflicts) than any other state. I've never seen another place where they treat veterans and honor them this well. The folks here are very down to earth … and they're very patriotic."

The memorials, conveniently located within walking distance of the Indiana Convention Center, home of the Pumper & Cleaner Environmental Expo, include the Soldiers and Sailors Monument, the tallest memorial to Civil War veterans in the U.S.

> **"Indiana has provided, based on population, more service members (in all conflicts) than any other state. I've never seen another place where they treat veterans and honor them this well."**
>
> **Brig. Gen. J. Stewart Goodwin**

The Indiana World War Memorial sits 210 feet above street level; this mausoleum-style limestone and marble memorial pays homage to Hoosiers killed during World Wars I and II, the Korean War and the Vietnam War. A military museum in the basement allows visitors to follow the history of Indiana soldiers from the Battle of Tippecanoe through the most recent conflicts.

"Once we get them in the building, we've got them. The structure and architecture is amazing," says Goodwin.

The mall itself also includes memorials for World War II and the Korean and Vietnam wars, as well as Veteran's Memorial Plaza. The USS Indianapolis Memorial recognizes those who died on the last U.S. ship to sink in World War II. Of the approximately 1,200 sailors on board, only 317 survived.

Goodwin notes that one of every 10 people has served in the military. "We try to educate the 90 percent about what the 10 percent did," he says. ✦

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The limestone Soldiers and Sailors Monument on Monument Circle, designed by Bruno Schmitz, is 284 feet high and the iconic heart of downtown. The Col. Eli Lilly Civil War Museum is in the lower level. Visitors can climb the 330 steps to the top or ride an elevator to get an eagle-eye view of the city from the observation deck. The monument is only 15 feet shorter than the Statue of Liberty.

The Central Canal runs through White River State Park and is home to the Congressional Medal of Honor Memorial. Curved glass walls represent medal recipients from the Civil War through Iraq and Afghanistan. A sound system plays recorded stories of medal recipients.

The Indiana World War Memorial Plaza is five blocks long and home to the American Legion National Headquarters. In the foreground is Depew Memorial Fountain in University Park. The Indiana War Memorial is seen in the background.

FOR MORE INFORMATION

Indianapolis Historic Sites, www.visitindy.com/indianapolis-attractions-historic-sites

Indiana World War Memorial, 431 N. Meridian St.; 317/232-7615; www.in.gov/iwm/

Soldiers & Sailors Monument/ Col. Eli Lilly Civil War Museum, 1 Monument Circle; 317/232-7615; www.ulib.iupui.edu/kade/soldiers.html

USS Indianapolis Memorial, Walnut St. & Senate Ave.; 317/232-7615; www.ussindianapolis.org/monument.htm

Korean and Vietnam War Memorials, 700 N. Pennsylvania St.; www.visitindy.com/indianapolis-attractions-historic-sites-vietnam-and-korean-war-memorials

World War II Memorial, 700 N. Pennsylvania St.; www.in.gov/iwm/2364.htm

BACK TO BASICS

A focus on education is necessary to keep the industry moving forward

NASSCO (National Association of Sewer Service Companies) is located at 11521 Cronridge Drive, Suite J, Owings Mills, MD 21117; 410/486-3500; www.nassco.org

By Ted DeBoda, P.E.

As the New Year kicks off, we need to remember the importance of continually educating the water and sewer providers and consultants responsible for keeping our infrastructure operational.

At NASSCO, the National Association of Sewer Service Companies, our core goal is to improve the success rate of everyone involved in the pipeline rehabilitation industry through education, technical resources and industry advocacy. Providing technical resources and industry advocacy is an important part of the picture, but to reach this goal we must continue to focus on the importance of education.

Professionals in both the public and private sectors need to be aware of the technologies available so they can specify the most appropriate and cost-effective means to meet their needs. For the past 12 years, NASSCO has presented the "RehabZone," a hands-on interactive educational experience focused on the rehabilitation of sewer and water infrastructure. The event is held every year at the annual Underground Construction Technology (UCT) conference. It is planned, staffed and sponsored by NASSCO members, but the cornerstone to its success is the "no-sell" philosophy. That philosophy allows participants to focus on specific technologies without sales spins toward specific products and manufacturers. I invite you to learn more about the RehabZone at www.rehabzone.org.

We realize everyone can't make it to these major conferences, so the RehabZone Technology Guide is also available. This guide provides concise explanations of new (and not so new) rehabilitation technologies and is updated every year by NASSCO's RehabZone Committee. It serves as an excellent reference for professionals either starting out in the industry or those interested in the latest technologies available, and can be obtained by contacting NASSCO directly.

Another highly educational experience is the Sewer History Exhibit, which is displayed annually at both UCT and WEFTEC. This exhibit provides the largest collection of historically significant water and sewer pipes, tools and equipment, as well as displays showing early sewer challenges and designs. You can see many of

(continued)

Get the EDge

Training and Continuing Education Courses

PACP TRAINING

January 8-10, 2013
Antioch (San Francisco), CA
Includes Manholes and Laterals!
Trainer: Brandon Conley
For more information or to register contact Kay Doheny at 248-939-3220 or pacp@dohenysupplies.com

January 15-17, 2013
Owings Mills, MD
Includes Manholes and Laterals!
For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

January 15-17, 2013
San Diego, CA
Includes Manholes and Laterals!
Limited number of re-certifications accepted.
For more information or to register contact Marilyn Shepard at 916-899-8961 or dawn@nassco.org

March 8-10, 2013
Twinsburg (Cleveland), OH
Includes Manholes and Laterals!
Trainer: Brandon Conley
For more information or to register contact Kay Doheny at 248-939-3220 or pacp@dohenysupplies.com

March 18-20, 2013
Owings Mills, MD
Includes Manholes and Laterals!
For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

April 15-17, 2013
Owings Mills, MD
Includes Manholes and Laterals!
For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

May 6-8, 2013
Owings Mills, MD
Includes Manholes and Laterals!
For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

May 6-8, 2013
Northville, MI
Includes Manholes and Laterals!
Jack Doheny Companies Open House Equipment/Training Show
(Thurs. May 9, 2013 - ALL INVITED)
Trainer: Brandon Conley
For more information or to register contact Kay Doheny at 248-939-3220 or pacp@dohenysupplies.com

May 14-16, 2013
Atlantic City, NJ
Includes Manholes and Laterals!
NJWEA Annual Conference
Trainer: Brandon Conley
For more information or to register contact Kay Doheny at 248-939-3220 or pacp@dohenysupplies.com

June 3-5, 2013
Whitestown (Indianapolis), IN
Includes Manholes and Laterals!
Jack Doheny Companies Open House Equipment/Training Show
(Thurs. June 6, 2013 - ALL INVITED)
Trainer: Brandon Conley
For more information or to register contact Kay Doheny at 248-939-3220 or pacp@dohenysupplies.com

PACP RECERTIFICATION

January 8, 2013
Owings Mills, MD
PACP User Recertification
For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

March 7, 2013
Sacramento, CA
PACP User Recertification
For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

April 9, 2013
Owings Mills, MD
PACP User Recertification
For more information or to register contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

ITCP TRAINING

January 24-25, 2013
Tucson, AZ
8:00 a.m. – 5:00 p.m. Daily
Trainer: Gerry Muenchmeyer
For more information contact Dawn Jaworski at 410-486-3500 or dawn@nassco.org

NASSCO PRO TRAINING

If you are interested in having a class at your facility or in your area contact Gerry Muenchmeyer at 252-626-9930 or gmuenchmeyer@suddenlink.net

the artifacts, timelines, articles and even "Sewers in the News" by visiting www.sewerhistory.org.

Finally, the NASSCO website (www.nassco.org) also provides a wealth of educational tools to help further our mission to set industry standards. The three-part "PACP Preview" provides a broad overview of the Pipeline Assessment Certification Program (PACP) and includes some images and CCTV clips to introduce viewers to pipeline assessment. NASSCO's work with the Water Environment Federation (WEF) to successfully incorporate PACP into their "Operations Challenge" has required the production of PACP quizzes that can be used by managers to assess and develop their CCTV operators. It can also be used by PACP users to hone their skills.

The NASSCO website also offers a free webinar for Cured-in-Place Pipe (CIPP) that can be found under the "ITCP" logo on the home page.

Highlights of the NASSCO Jetter Training Video can be found on the NASSCO home page as well. The full video is available for purchase, or for free with a NASSCO membership.

Professionals in both the public and private sectors need to be aware of the technologies available so they can specify the most appropriate and cost-effective means to meet their needs.

You can also find a variety of general specifications on nassco.org along with those specific to our divisions, the Infiltration Control Grouting Association (ICGA) and International Pipe Bursting Association (IPBA).

Moving forward in 2013, NASSCO plans to work more closely with the WEF Collection Systems Committee to develop free webcasts about underground technologies, starting with "Facts About the Use of Chemical Grouting," which will involve discussion about the new Grouting Specification introduced by the ICGA. NASSCO continues to develop a relationship with WEF, and we hope to see more NASSCO participation at WEFTEC and the regional WEF collections conferences throughout the year.

In a previous article, I spoke about NASSCO's strategic planning efforts. During that process, we took a hard look at NASSCO's core goal and found it to be as relevant today as it was when it was developed years ago. In a time when municipalities are doing more with less, the free educational opportunities mentioned here are NASSCO's way of giving back to the industry and promoting our mission to assure the continued acceptance and growth of trenchless technologies. ✦

Ted DeBoda is executive director of NASSCO. He can be reached at director@nassco.org.

PIPELINE REHABILITATION AND RELINING

By Briana Jones

Sag correction system

The **Sag Correction System** from **Advanced Construction Products** is a three-section machine assembled inside the manhole that uses a combination of high-frequency vibration and an internal lift mechanism to raise the pipe and remove low spots in PVC sewer lines, eliminating excavation. Intense vibration allows the pipe bedding material to flow around and underneath the pipe as it is lifted. Sags of any length can be removed by moving the machine in increments and lifting the length of the sag. The system corrects sags in 8-, 10- and 12-inch-diameter pipe. **503/359-4670; www.advancedconstructionproducts.com.**

Composite pipe wrap

ENECON's DuraWrap composite is a combination of high-performance polymers and carbon fiber technology designed to repair, rebuild, reinforce and restore the integrity of often severely deteriorated piping, tanks and other fluid flow systems, extending their service life and eliminating the need for replacement.

The wrap system can be applied to the interior and exterior of piping and equipment to seal and strengthen the components. When applied to the interior walls of underground and other inaccessible piping, the wrap can repair and restore pipe integrity without excavation or replacement. **888/436-3266; www.enecon.com.**

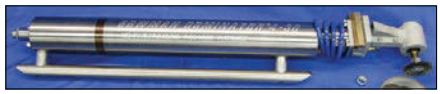
Service line tool

The Wedge service line replacement tool from **Footage Tools** is a low-cost alternative to open-trench methods for replacing defective 3/4- to 1-inch water services. Users make small entrance and exit pits, then insert a 3/8-inch aircraft cable through the existing water service and connect to a single-edge Wedge SE (for copper and galvanized pipe) or triple-edge Wedge (for PVC and PE pipe). The back of the unit offers adapters to connect the new service line. Users attach the cable grip, then connect it to the bucket of a backhoe or heavy-duty winch and begin pulling or splitting out the old service and replacing the new service at the same time. This method adds value by minimizing the costs of replacing landscaping. **888/737-3668; www.footagetools.com.**

Slide rail system

The **Slide Rail Shoring System** from **American Shoring** can be used in a number of configurations, including for the bore pits commonly used to bore under roadways, streams or other obstacles. The sheeting system can be used at depths up to 30 feet and is installed with an excavator with no need for special equipment. The system can also be equipped with a doghouse panel to accommodate the casing pipe. **800/407-4674; www.americanshoring.com.**

Reinstatement cutter



The **Dominator 430** from **Bowman Tool Company** is a reinstatement cutter designed to operate in 6- to 30-inch relined pipe. Performance is improved by the unit's streamlined design because there is no external air tube, and its stability in the pipe because of its 72-pound construction from a solid billet of stainless steel. The cutter's head assembly incorporates a pinionless, quick-change design and one adjustable gib to reduce adjustment time and maintain accuracy. Lateral reinstatement is achieved with the 0.8 or 1.2 hp cross flow air motor. For optimum cutting performance in 8-inch and larger pipe, the 2.5 hp geared air motor can decrease reinstatement time by about 80 percent.

Maintenance is simple because the unit can be disassembled and reassembled in about 30 minutes with only eight moving parts. All electric motors are isolated at the end of the cutter in a watertight chamber eliminating water-damaged motors and allowing for easy and quick access. The unit is made of temper-hardened stainless steel and bronze enabling it to cut tough liners, including UV-cured lines. **717/432-1403; www.bowmantool.com.**

Continuous lining

The **Top Gun F-18** system from **Perma-Liner Industries** lines 12- to 18-inch-diamater pipes with 600+ feet of continuous air inversion lining. The unit averages 1 foot of liner inverted per 1.5 seconds. Rapid steam cure allows users to complete multiple shots in one day. The turnkey installation system comes with manifold and hoses. The pre-wet liner requires no wet-out facility. Five days of on-site training and certification are included. Specially designed Turnkey Trailers are also available. **866/336-2568; www.perma-liner.com.**

Internal joint seal system

The **HydraTite** internal pipe joint seal from **Cretex Specialty Products** is trenchless remediation for the repair of pipe joints. It eliminates infiltration and exfiltration with a mechanical seal that has a rubber seal (EPDM or nitrile) spanning the joint and steel retaining bands. Each seal is custom-made to ensure compliance with project specifications. The system can be used in almost any type of pipe (iron, concrete, clay or plastic) from 24 to 216 inches in diameter. Seals are available in 11-, 14- and 21-inch widths.

Retaining bands are made from carbon steel, 304 stainless, 316L stainless or AL-6XN. The thickness of the bands varies with the size of the seal. A stainless steel backing plate can be added behind the seal for added support when spanning voids in the pipe wall, such as the remediation of expansion joints, sealing off abandoned laterals, or when repairing deteriorated joints. The joint seal system is able to withstand the corrosive effects of hydrogen sulfide and offers a cost-effective alternative for small repairs where structure of the pipe is not compromised. **800/345-3764; www.cretexseals.com.**

All-terrain drill

The **JT30 All Terrain** horizontal directional drill from **Ditch Witch** is equipped with a 119 kW, Tier 4i engine. The machine operates with high efficiency with full power available to all functions. The drill includes assisted makeup and break-out, which means it automatically adjusts the carriage thrust speed when making up and breaking out drill pipe. This saves wear on pipe threads and helps reduce operator fatigue.

Other features include intuitive carve mode, which enables easy steering with the TriHawk bit; double-pivot drill frame, which allows steep entry angles without raising the tracks off the ground; and a heavy-duty anchor system that enables users to push or pull the full machine thrust and maintain stability, resulting in a more productive and efficient bore. The unit features the company's All Terrain technology with advanced inner-rod design, enabling it to drill in the widest range of ground conditions, from mixed hard soil to solid rock. **800/654-6481; www.ditchwitch.com.**

No-dig repair

The **SnapLock** system from **Ratech Electronics** is a no-dig repair system that renovates the defective section of a sewer or pipe. No chemicals are necessary for installation. The economical and efficient system offers quick repair for damaged areas in a pipe when its overall condition makes evacuation and complete relining unnecessary and expensive. Made of high-grade stainless steel and surrounded by a rubber outer sleeve, the system is highly durable and resistant to most chemicals, including hydrogen sulfide. It is available in various diameters and lengths. **800/461-9200; www.ratech-electronics.com.**

Versatile vac unit

The **MC Series** unit from **GapVax** is made of 3/16-inch ASTM A572 Grade 50 Exten steel. The debris body ranges from 5 to 12 cubic yards (stainless steel also available), and the stainless steel water tank can hold up to 2,000 gallons. The unit has a unitized water and debris tank with a double subframe, and a heavy-duty, double-acting, single-lift cylinder provides a stable 50-degree dump angle. Vacuum pump options range from 3,500 to 5,000 cfm with up to 27 inches Hg.

As a wet-only vacuum truck, the unit includes an 8-foot, front-mounted telescopic boom with dual-lift cylinders, reaching 26 feet with a 270-degree rotation. The front-mounted hose reel has an 800-foot by 1-inch hose capacity. The standard water pump is rated at 80 gpm at 2,000 psi; other water pumps are available. Various options include a washdown system, hydroexcavation package, extra storage space, heated boxes, liquid level load indicators, remote pendants and wireless remotes for boom, vac break, water controls, additional work lights and tube racks. The unit is designed for hydroexcavation, jetting, waterblasting, flushing out sewer lines, and maintenance. **888/442-7829; www.gapvax.com.**

Relining system

Prep From The Main from **Liqui-Force** allows for relining of sewer laterals without the cost, inconvenience and liability associated with the installation of a clean-out. The system enters through the manhole and traverses to the point of the lateral connection. From this location, various cleaning, video inspection and measurement tools are inserted as far as necessary up the lateral to prepare it for lining. Each of these processes takes only a few minutes and many laterals can be readied for lining in an eight-hour shift.

The data is immediately transferred to the manufacturing facility (via the Web) for liner production, without copying and errors. The system operates in various sizes of mains and negotiates laterals from 4 inches and larger. The system follows the cleaning equipment down the main from the manhole to the lateral, where it sends a custom-built liner up the lateral and attaches it to the main with a gasketed seal that stops leaks and root intrusion. **800/265-0863; www.liquiforce.com.**

Pipe and tube belt sander

The **RBE12-180** pipe and tube belt sander from **Metabo** features a 1,200-watt, 10-amp Marathon motor with double gear reduction, exact sanding belt guidance and a 270 degree maximum wrap angle. It includes electronic speed stabilization, electronic soft start, a thumbwheel to preselect the tool's speed, a tool-less sanding belt exchange, overload and power interruption protection, a winding protection grid and auto-stop carbon brushes. It can be used to take metals from a welded or mill finish to mirror finishes. **800/638-2264; www.metabousa.com.**

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Lateral cutter

The **Mi-T-Cutter** from **Nu Flow Technologies** is designed to cut open lateral reinstatements from the inside rather than the branch line. It fits in 4- to 6-inch lined pipe and cuts open lateral reinstatements, trapped drain connections, and cuts out hard debris in long sections of drain lines. The cutter is 32 inches long and includes three cutting heads. It has a bladder that locks into place, making it ideal for vertical pipe reinstatements. With a separate airline, the camera lens is kept free of debris for clear viewing on the 19-inch monitor.

The camera holder fits a RIDGID camera head, can be adjusted to any angle for optimal visibility, and includes a 250-foot video coax so users can view lateral and main views alternately on the monitor with the flip of a switch. The cutter requires 7 to 10 cfm of air and a standard 110 V outlet to power the control box. The low-geared drive system includes a clutch system to prolong motor life. The cutter includes a 100-foot umbilical cable with optional 200- and 300-foot cables available. **800/834-9597; www.nuflowtech.com.**

Pipe and liner cutter

The air-powered **Titan 150** from **Pipeline Renewal Technologies** delivers 1 3/4 hp at 12,000 rpm and cuts most pipe or liner material rapidly, cleanly and precisely. With two-axis articulation, its cutter arm reaches up 9 inches and sweeps 400 degrees, and also performs horizontal front cutting. Variable-speed arm articulation and creeping ensure maximum cutting precision without constant joystick manipulation.

Lightweight hose design allows the unit to travel up to 400 feet. Its vane motor delivers high-performance power without overheating. An integral water-flushed pan/tilt color camera presents real-time cutting footage. Available diamond-impregnated Kardiam bits are cooled by the unit's onboard water quenching and deliver 75 to 100 hours of cutting. Hundreds of bit styles are available to suit specific applications. **866/936-8476; www.pipelinert.com.**

Pneumatic shoring device

The **Prospan** pneumatic shoring device from **Prospan Manufacturing** is simple to use and virtually maintenance-free. The unit is OSHA compliant and offers Tabulated Engineering Data. It can bear directly against the trench wall without the use of plywood in most instances, which increases productivity.

The shoring device is made primarily of anodized aluminum. The telescoping system is powered by compressed air from either a compressed air cylinder or onboard compressor capable of generating a minimum of 115 psi. Once pressurized, it expands and exerts pressure into the sidewall of the trench. It is then locked in extension following a few simple steps and the air is then exhausted. A wide array of end attachments and extensions are available. **888/413-8100; www.prospanshoring.com.**

Felt liners

Applied Felts offers a full line of **felt liners** for CIPP installations. All liners are manufactured in one location and are subjected to a multistage testing system. They are custom-made to exact specifications for pipe sizes from 3 to 105 inches. **276/656-1904; www.appliedfelts.com.**

Lateral sealing system

The **Interfit** lateral sealing system from **Quadex/InterfitUSA** eliminates infiltration and root intrusion. The system seals lateral connections to lined sewer mains and extends from the main 12 to 20 inches into the lateral, sealing the annular space between a main liner and the host pipe, the lateral connection and the first joint. The system includes a full main wrap (360 degrees) CIP fiberglass sock in the main that anchors the lateral portion of the sock. The non-shrinking silicate resin impregnated sock is installed via an inflation packer. By using 20 to 30 psi inflation pressure, the system attains high-quality resin migration into pipe defects, yielding high-quality mechanical adhesion and long-term performance. **www.quadexonline.com.**

CIPP lining

Quik Heater CIPP sewer lateral lining equipment from **Quik Lining Systems** addresses shorter lateral lines of 4- and 6-inch-diameter sizes. The unit generates 120,000 Btu/hr of hot water and will cure up to 120 feet of 6-inch-diameter CIPP liner in about an hour. It comes with all the fittings and adapters to cure liners in those ranges. It weighs less than 75 pounds, is fired with propane, and can be used in ventilated confined spaces. The unit requires no steam/boiler operators' licenses. Also available are the Quik Shot lateral lining gun, calibration rollers, heat cure equipment and appurtenances. **714/296-5262; www.quiklining.com.**

Hydroexcavation tool

The **Soil Surgeon** hydroexcavating tool from **The Soil Surgeon Inc.** is designed to fit any sewer combination truck equipped with a telescopic 6- or 8-inch boom. The tool has a 1-inch water connection. The operator controls water pressure and power with truck controls. Features include 6-foot Tuff Tube with handles to guide the unit down for potholing or side to side for trenching. Six jets boring inward cut the soil, while six jets boring outward bring the tube down. Bumpers on the bottom protect the jets and lines the tool might contact. **949/363-1401; www.soilsurgeoninc.com.**

Point repair system

QuickLock Point Repair from **Rausch Electronics USA** is a permanent pipeline rehabilitation installation that features a 316L stainless steel liner encased in an EPDM rubber sleeve that is mechanically compressed against the inner pipe wall and is permanently locked in place by two gear mechanisms. No chemicals or resins are used, so there is no cure time.

Applications include sealing leaking joints, fixing cracks and holes, preventing root intrusion and abandoning laterals. The system reinstates the structural strength of the pipe and is a permanent and reliable repair. Installation will withstand and pass internal pressure tests. Since there are no chemicals involved, the system can be installed with flow present. The QuickLock Packer comes in several sizes to cover a range from 6- to 32-inch-diameter pipe. **717/709-1005; www.rauschtv-usa.com.**

Rotary cutters

Rotary cutters from **Reed Manufacturing Co.** are available for big and small pipe diameters. The RC42S unit cuts 40- to 42-inch steel pipe. It takes advantage of good leverage from its long handle, which is used to turn and tighten the cutter. Pipe snaps off squarely once the operator works it manually around the cut zone. The LCRC4 low-clearance cutter is available for 2- to 4-inch steel, cast iron or ductile iron. Also of heavy-duty construction, the junior-sized cutter requires a 4-inch clearance around the pipe to make the cut. Quality Reed cutter wheels are used in both models, ensuring a great cut due to the wheels' thin profile. **800/666-3691; www.reedmfgco.com.**

Small bursting unit

The **X20** pipe bursting unit from **TRIC Tools** is the smallest and lightest of the updated X-Series units. It is designed for home sewer bursting of 4-inch lines and smaller and weighs less than 60 pounds. Small cylinders cycle quickly with matching high-pressure hydraulic power packs, resulting in fast job completion. Complete down-hole assembly consists of puller (8 inches wide by 27 inches long by 5.25 inches in diameter retracted), pulley base (12 inches wide by 13 inches long by 14 inches high), and resistance plate (24 by 24 inches and 1 inch thick). The compact unit features a monolithic, gun-drilled hard aluminum cylinder body for simplicity and easy maintenance, and a steel pulling bridge for extra reliability and longevity. **888/883-8742; www.trictools.com.**

Pipe bursting system

The **UnderTaker** pipe bursting system from **Spartan Tool** is designed to burst and replace sewer laterals of any material with seamless, high-flow HDPE pipe from 2 to 6 inches in diameter. The system sets up quickly without any tools. No component weighs more than 70 pounds so it is easy to position the unit for any job.

With burst speeds to 5 feet per minute, it will quickly replace any sewer lateral, handling up to three 45-degree bends in the existing pipe. The system comes complete including everything needed to fuse and burst pipe. It causes minimal disruption to customers' yards or businesses. **800/435-3866; www.spartantool.com.** ✦

Fusible pipe withstands pulling force

Problem

Blair Township in Grand Traverse County, Mich., was required to expand water storage and delivery infrastructure to increase its fire suppression capability.

Solution

The site for the new ground storage tank was 11,000 feet from the water distribution system. To reach it, the township installed a 16-inch pipeline using bell-and-spigot C905 PVC pipe for the open-cut sections and 1,600 feet of **DR18 fusible C-905 pipe** for the horizontal directional drilling portions, which crossed through wetlands and tight easements along a state road. **Underground Solutions** supplied the pipe and fusion services.

RESULT

Sandy soils made for a challenging 1,000-foot pull, but the high tensile strength of the fusible pipe withstood the force with no stretching or deformation. The township improved its fire suppression capability in a cost-effective manner with reduced disruption. **858/679-9551; www.undergroundsolutions.com.**

Cast mortar liner rehabilitates pipe

Problem

Workers from Republic Services in San Diego, Calif., noticed severe erosion around the inlet of a 48-inch corrugated metal pipe running 8 to 20 feet below grade at the Otay Landfill. An inspection revealed 200 feet of failing pipe.

Solution

The owners hired **AP/M Permaform to rehabilitate the line with Centri-Pipe,** a system that uses a spincaster to centrifugally cast a 1.25-inch-thick fiber-reinforced concrete liner. Workers applied PL-8000 mortar in three passes. During each application, the operator in the pipe visually confirmed adherence and layer thickness, adjusting the withdrawal speed as needed.

RESULT

The rehabilitation, completed in eight days, does not impede hydraulic capacity. "Centri-Pipe was a huge savings over other lining systems and the quality of the structural lining exceeded our expectations," says a Republic Services spokesperson. "We'll be using the product on additional pipe as soon as our budget allows." **800/662-6465; www.permaform.net.**

Trenchless point repair system reduces I&I

Problem

More than 3 inches of rain put the Newport (N.C.) Wastewater Treatment Plant into flood mode, costing the town countless hours of overtime and totes of polymer. To stop inflow and infiltration, the town began a six-year sewer repair program using many trenchless technologies.

Solution

"By far, point repairs using the **Infrastructure Point Repair System** was the most cost effective," says utilities director Clay Dulaney. One repair for a major leak reduced the run time on a T6 Gorman Rupp pump by an hour a day. Dual point repairs costing less than $1,000 sealed a storm drain leak, eliminating the flood mode problem.

Workers also rehabilitated a 12-inch main occluded to half its diameter. The pipe ran over a tidal creek leading to oyster beds. Engineers estimated $50,000 to $70,000 to replace the constricted segment, but workers cleaned and lined it with several point repairs for less than one-quarter of the replacement cost, and with no environmental disruption.

RESULT

The town dramatically reduced I&I despite a 20 percent increase in residential customers. **877/327-4216; www.irsi.net.**

Chain saw makes quicker work of cuts

Problem

Installing a T-connection into a ductile iron water main in Netstal, Switzerland, required closing the busy road and rerouting traffic. The pipe, still under pressure, could not be completely emptied.

Solution

Using the **PowerGrit utility saw from ICS, Blount International,** workers made a relief cut through the pipe from a single access point and drained the remaining water. They also used the saw to remove other pipe sections. The saw's grinding technology eliminates rotational kickback, keeping workers safer in the trench. The bar and chain design gives operators better control to make precise cuts around utilities in tight spaces.

RESULT

From groundbreaking to reopening, the road took less than 12 hours, saving the developer time and money, and gaining the residents' appreciation. **855/797-4748; www.powergrit.com.**

Fiberglass pipe repairs sewer

Problem

A 70-foot-deep sinkhole west of a sidewalk in Brooklyn, N.Y., caused 11 families to be evacuated from a nearby apartment building. Emergency crews from the city's Department of Environmental Protection closed the block to traffic, stabilized the sinkhole and planned a repair.

Solution

Hobas Pipe USA delivered 120-inch-diameter, 46 psi stiffness pipe to the site within one day of receiving the purchase order.

RESULT

Crews installed the corrosion-resistant fiberglass pipe, returned the sewer to service, and conducted a study of the infrastructure. **800/856-7473; www.hobaspipe.com.** ✦

Iowa Mold Tooling names director of sales

Iowa Mold Tooling, an Oshkosh Corp. company, named Don Daniels director of sales. He has 30 years experience in sales management and sales strategy.

SPIR STAR names sales representative

SPIR STAR promoted Ronnie Allen to sales representative. Allen joined the company in 2007, beginning in production and advancing to hose assembly technician.

Ronnie Allen

Anvil acquires North Alabama Pipe

Anvil International, manufacturer of pipe fittings, pipe hangers and piping support systems, acquired the assets of North Alabama Pipe Corp., provider of pipe fabrication equipment.

Neenah Enterprises names VP; Foundry marks 140 years

Neenah Enterprises named Scott Hoffman vice president, municipal group. He has 25 years of manufacturing, procurement, production and sales experience. Neenah Foundry also celebrated its 140th anniversary in October. Founded in 1872 by William Aylward as Aylward Plow Works in Neenah, Wis., the foundry cast its first manhole covers and sewer grates in 1904.

PPI, ICC to work together on projects

The Plastics Pipe Institute signed a memorandum of understanding with the International Code Council providing a framework for the organizations to identify opportunities to work together on educational, technical, scientific, legislative and regulatory matters.

McElroy launches online university

McElroy launched an online university at www.mcelroy.com/university. The site includes fusion instruction videos and courses for hands-on training and certification. Hosted on YouTube, the videos can be viewed on most computers, tablets and smartphones.

Euro-Center staff

PSG opens California Euro-Center

Pump Solutions Group, a business unit within Dover Corp., opened its Almatec and Mouvex Euro-Center facility in Grand Torrance, Calif. The service center provides application engineering, market and after-sales support.

Storm Water Systems among Solutions Awards finalists

Storm Water Systems was chosen as one of 16 Solutions Awards finalists for its Bandalong Litter Trap by the Savannah Ocean Exchange Global Review Panel. The award honors corporations and groups that generate economic growth and productivity while reducing waste and the use of natural resources. Made of inert, corrosion-free, high-density polyethylene (HDPE) and aluminum, the trap floats in waterways, utilizing natural current to guide and capture litter.

Amazing Machinery moves into new facility

Equipment supplier Amazing Machinery moved into a new 6,000-square-foot building in Cleveland, Tenn. The location includes 2,000 square feet of dedicated retail and showroom space. ✦

Product Spotlight

Pipe relining system seals without epoxy or curing

By Ed Wodalski

SureFIT close fit liner from Agru America

SureFIT close fit liner from Agru America is designed for rehabilitating damaged pipelines with minimal environmental impact. Applications include sewage disposal and industrial piping, as well as natural gas and potable water supplies. The trenchless PE 100 liner can be used on concrete, steel, cast iron, stoneware or PVC pipes to seal cracks and repair leaky connections or damage caused by corrosion or root intrusion. The liner, manufactured according to international standard EN 14408-3, EN 14409-4 and EN 13566-3, can be inserted via existing manholes or small construction pits.

The factory-preformed pipe is folded into a U-shape, reducing the cross section by approximately 15 percent for easier insertion into the host pipe than traditional sliplining. The liner is coiled on reels in 100- to 1,000-meter lengths (approximately 328 to 3,280 feet) depending on pipe size. When heated, the preformed pipe conforms to the shape of the host pipe without the need for epoxy or curing.

"If you're trying to pull a plastic pipe that's approximately the same diameter as the existing pipe, it can be very difficult without it being deformed first," says Roger Rutherford, sales and technical director, Plastic Piping Systems, for Agru America. "This makes it a lot easier to pull into the existing line. PE 100 pipe has a very good memory. The deformed pipe, once it cools, will stay in that shape. It can be put on a spool and delivered to the job site."

With the host pipe cleaned of deposits and protrusions, the liner is winched through; one end is closed and steam is introduced. "The steam warms the pipe and causes it to go back to its original (round) shape," Rutherford says. "It's not cured in place."

The PE 100 pipe, which has a DR 17 wall thickness, is more durable than cured-in-place pipe (CIPP) lining or blown-in lining, he adds.

Available in SDR 26 and SDR 32 sizes for sewer pipe, the highly flexible liner can be joined using electro fusion welding. Manufactured in Austria, pipe sizes range from 142 mm (approximately 5 inches) to 390 mm (approximately 15 inches) outside diameter for SDR 26 and 340 mm (approximately 13 inches) to 390 mm for SDR 32. Potable water and natural gas SDR 17 pipe is available in 78 mm (approximately 3 inches outside diameter) to 390 mm sizes. **800/373-2478; www.agruamerica.com.**

ELAN manhole cover with integrated antenna

The composite manhole cover with integrated antenna system from ELAN Technologies and GMI Corp. is designed to support secure, rugged, industrial communications typically found in harsh underground utility environments. Applications include AMI smart metering and distribution automation for electric utilities; sewer flow monitoring and level monitoring for real-time collection system management and control; leak detection; and combined and sanitary sewer overflow monitoring. The lightweight cover meets AASHTO H-20 traffic rated requirements supporting up to 100,000 pounds. **815/463-8105; www.elantechnologies.net.**

Endress+Hauser differential pressure level transmitter

The Deltabar FMD72 electronic differential pressure measurement system from Endress+Hauser uses two pressure sensor modules connected electronically to a single transmitter, eliminating the need for impulse lines or capillaries. One sensor module measures the hydrostatic (high pressure) and the second measures the head pressure. The transmitter calculates differential pressure. Measured values can be used to calculate the level, volume or mass of liquids in pressurized tanks. Sensors connect to the transmitter module via industry standard, color-coded, twisted pair cable and have NEMA 4X/6P watertight housings and connections. **888/363-7377; www.us.endress.com.**

Sure Seal 345-Series butterfly valve

The 345-Series butterfly valves from Sure Seal are designed for use in rugged environments and with various types of loads. The lightweight valves feature improved flow through the use of a thin disc and large valve opening. The aluminum valves are available in six sizes from 2 to 6 inches and contain no hardware on the disc that could loosen and contaminate the product. **800/382-1604; www.suresealinc.com.**

Singer Valve single rolling diaphragm

The single rolling diaphragm (SRD) pressure-reducing valve from Singer Valve is available in 6- and 8-inch sizes. The valves provide steady pressure control without the need for low-flow bypass. **888/764-7858; www.singervalve.com.**

Metabo cordless angle grinder

The W18 LTX professional grade cordless angle grinder from Metabo Corp. is powered by lithium-ion batteries (two Extreme 4.0 Ah or 3.0 Ah) with rotating battery pack. Features include slim motor housing and ergonomic side handle, motor protection with no-volt release switch that protects against unintentional starts when inserting the battery, burst-proof adjustable guard, and electronic shutoff to protect against kickback. Other features include thermal overload protection, electronic soft start for added motor life, and air-cooled charging technology for longer battery life. **800/638-2264; www.metabousa.com.**

VeriSight Pro roller skids

Roller skids from Envirosight are designed to maximize the inspection range of the VeriSight Pro push camera in 6- and 8-inch drain lines by reducing friction. The rollers attach with a threaded split-collar design. Aluminum and high-density composite construction ensure durability. The skids are compatible with all VeriSight Pro models. **866/936-8476; www.envirosight.com.**

Pipeline Analytics pipe inspection software

WinCan ProTouch pipe inspection software from Pipeline Analytics is designed for touch-screen data entry on a tablet PC using video from a crawler, push camera or zoom survey camera. The program is fully compatible with WinCan v8 and enables users to document manhole, mainline and lateral inspections. It generates basic manhole-to-manhole reports that include schematics and captured images. It also can export inspections to freely distribute viewable software so clients can review video alongside section detail. **877/626-8386; www.pipelineanalytics.com.**

Valve Boss portable valve exerciser

The Valve Boss model 70 portable, one-person valve exerciser and operation machine from Singleton Equipment has a Honda 4-stroke engine and weighs 27 pounds. Applications include distribution valve exercising, wastewater sluice gate operation and stormwater/levee district valve operation. It also can be used as a powerhead for pipe-tapping equipment. **225/226-8668; www.valveboss.com.** ✦

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POSITIONS AVAILABLE

Camera/Cutter operator wanted. Small growing lining company looking for an experienced CUES Cutter operator in California. New equipment, great crew, great pay. Send resume to Tom@CBLining.com or call Tom 661-816-4291. (M02)

RODDING MACHINES

2006 SECA 866, .375 sewer rodder on a 2006 GMC T6500 chassis, low miles, upgraded chassis to meet CA emissions standards. Perfect condition and new head. $30,000. Call 800-804-7772 for info. (M01)

1993 SRECO sewer rodder trailer w/robotic auto rod-feed, model HSRSR516TR, loaded with roll of 39" sectional rods, several cutter-tools, rod-guide, hose/tool, low hour, city machine, looks and runs great. For $11,000. Call/text/email Steve 206-786-4344, steve@seattlepump.com. (M01)

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Dynamic Repairs - Inspection Camera Repairs: 48 hour turn-around time. General Wire, Ratech, RIDGID, Electric Eel Mfg., Gator Cams, Insight Vision, Vision Intruders. Quality service on all brands. **Rental equipment available.** For more info call Jack at 973-478-0893. Lodi, New Jersey. (CMPBM)

TV INSPECTION

2000 Ford Cobra CCTV 2000, E-350, Ford diesel van for sale: 6"-15" and 8"-48" mainline cameras with pan & tilt, inverter, air compressor and many accessories, self contained. $42,000. Arlington, Texas. 817-467-7006. (M02)

WANTED

WATERWORKS MANAGER: N.Y. construction supply company/manufacturer looking for an energetic, experienced Waterworks Manager. Job entails estimating, customer service, phone sales, and learning new product lines. Excellent salary, benefits, 401K, profit sharing, health insurance, life/disability insurance. Excellent opportunity! Please email resume to gregf@precastconcretesales.com. Thank you for your interest! (MI03)

WORTH NOTING

PEOPLE/AWARDS

The Indiana Association for Floodplain and Stormwater Management, Inc. awarded **Stormwater Management,** the **Delaware County Commissioners,** and **Randall Miller and Associates Inc.** with the 2012 INAFSM Outstanding Stormwater Project Award for their role in the installation of the Delaware County Plaza Project.

The **City of Los Angeles L.A. Stormwater** website received the Web Marketing Association's 2012 WebAward for Outstanding Achievement in Web Development in the area of Environmental Excellence.

The **Water Environment Federation** received a $10,000 grant to promote innovative solutions to stormwater runoff across the United States. The grant was provided by the U.S. Environmental Protection Agency's Green Streets-Green Jobs-Green Towns Initiative.

The **Wenk Associates (Denver, Colo.) Design Team** was awarded a Merit Award and a Land Stewardship Award in Planning and Urban Design from the Colorado Chapter of the American Society of Landscape Architects (CCASLA) for the Prairie Trail Stormwater Guidelines. Prairie Trail is a 1,000-acre mixed-use, mixed density new urbanist community in Ankeny, Iowa.

Alfie Vick, an associate professor at the University of Georgia College of Environment and Design, received the Team Water Award from the Athens-Clarke County Stormwater Division during the Greenfest Awards Ceremony. The award recognized Vick for his ongoing work in the Athens area and acknowledged his expertise in sustainable design, especially when meeting the challenges of stormwater management.

The **Hopkinsville Surface and Stormwater Utility** was awarded the Kentucky League of Cities Enterprise City Award for the construction of the Woodmont Basin System to reduce flooding in the Country Club Lane and Sunset Circle area.

The American Public Works Association announced that its 2012-2013 president is **Elizabeth Treadway,** PWLF, Principal Scientist-Water Resources with AMEC's Environment & Infrastructure business in Johnson City, Tenn.

The American Water Resources Association announced that **Mark Dunning,** a senior project manager with CDM Federal Programs, has been named its president-elect.

The **Missouri Rural Water Association** was named the Association of the Year at the National Rural Water Association's Tribute to Excellence awards ceremony.

The Water Environment Federation announced that **Sandra Ralston,** a principal consultant with Malcolm Pirnie, the Water Division of ARCADIS in Charleston, S.C., was named its 2012-13 president-elect.

MSW *welcomes your contribution to this People/Awards listing. Please send notices of new hires, promotions, service milestones, certifications or achievements to editor@mswmag.com.*

MSW invites your national, state or local association to post notices and news items in this column. Send contributions to editor@mswmag.com.

CALENDAR

Feb. 11-15
National Utility Contractors Association Convention, Sheraton Phoenix Downtown Hotel, Phoenix, Ariz. Call 703/358-9300 or visit www.nuca.com.

Feb. 24-March 8
Water Environment Federation 2013 Water & Wastewater Leadership Center, University of North Carolina Kenan-Flagler Business School, Chapel Hill, N.C. Visit www.nuca.com.

Feb. 25-28
Pumper & Cleaner Environmental Expo International, Indiana Convention Center, Indianapolis. Call 866/933-2653 or visit www.pumpershow.com.

March 10-13
Water Environment Federation/American Water Works Association Utility Management Conference 2013, Renaissance Phoenix Glendale Hotel & Spa, Phoenix, Ariz. Visit www.wef.org.

April 7-10
American Public Works Association North American Snow Conference, Charlotte Convention Center, Charlotte, N.C. Visit www.apwa.net.

LEARNING OPPORTUNITIES

American Society of Civil Engineers

The ASCE has these courses:

- Jan. 8 – Preparing and Implementing Construction Site Stormwater Pollution Prevention Plans, online
- Jan. 9-11 – Pumping Systems Design for Civil Engineers, Las Vegas
- Jan. 11 – Construction Stormwater BMPs, online
- Jan. 17-18 – Financial Management for the Professional Engineer, Minneapolis
- Jan. 31 – Cold-Weather Stormwater BMPs That Work, online
- March 7-8 – Leadership Development for the Engineer, Chicago
- March 7-8 – NPDES Stormwater Permit Compliance, Pittsburgh
- March 7-8 – Stormwater BMPs That Work: Effective Analysis, Design and Maintenance, Chicago
- March 12 – Stormwater BMPs: What Works, What Doesn't and What About Maintenance, online
- March 14-15 – Financial Management for the Professional Engineer, Secaucus, N.J.

Visit www.asce.org.

American Water Works Association

The AWWA announced that its second edition of the *AWWA Water Operator Field Guide* is now available. Visit www.awwa.org.

Wisconsin

The Wisconsin Department of Natural Resources has a Government Affairs Seminar on Feb. 28 (site TBD). Visit http://dnr.wi.gov.

The University of Wisconsin Department of Engineering-Professional Development has these courses:

- April 8-9 – Using WinSLAMM v.10: Meeting Urban Stormwater Management Goals, Madison
- May 1-3 – Using HEC-HMS to Model Watersheds, Madison
- May 6-8 – Using HEC-RAS to Model Bridges, Culverts and Floodplains, Madison

Visit www.epdweb.engr.wisc.edu. ✦

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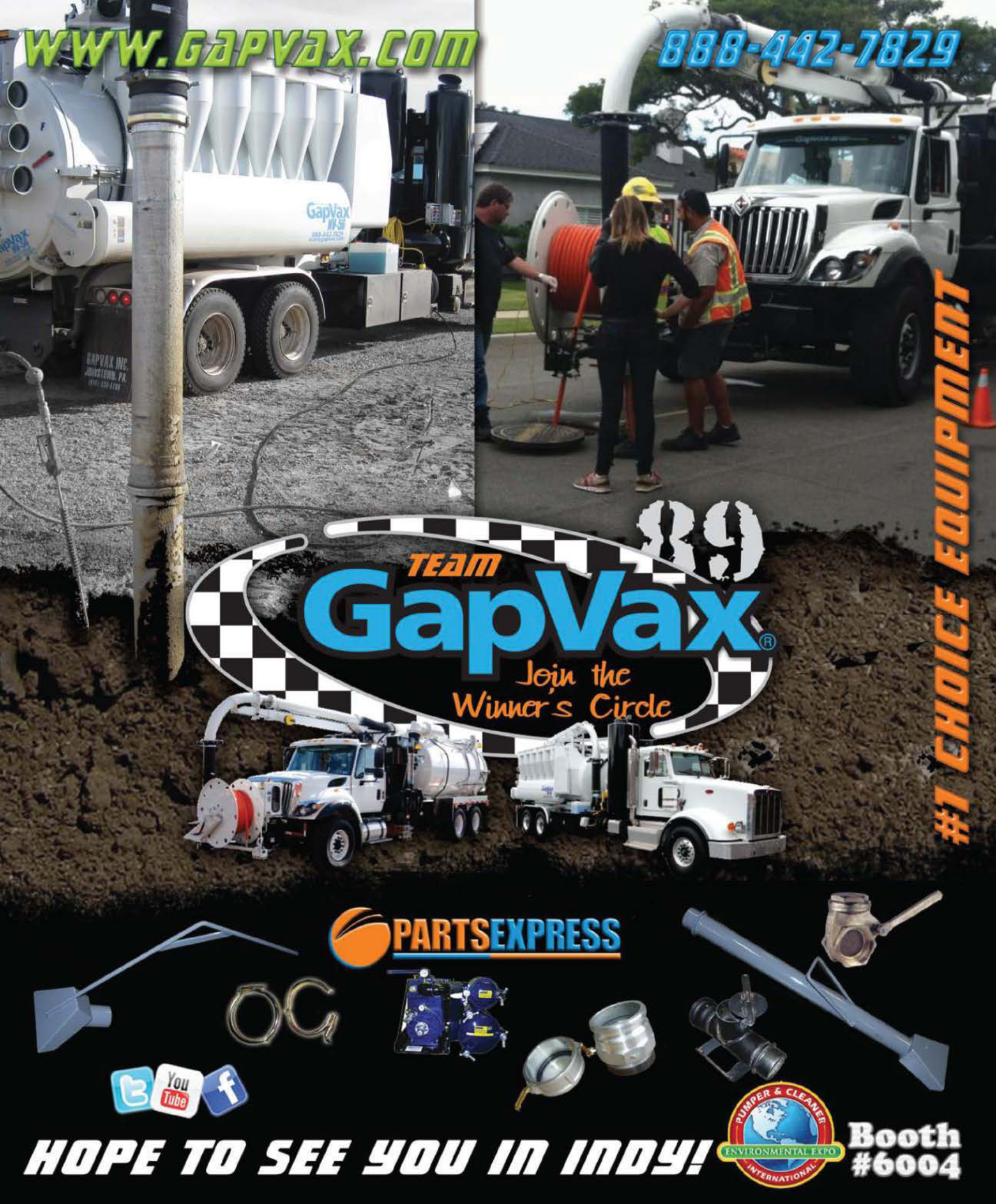
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