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June 2013

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and public outreach
put Mesa Water on top

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Jerry Vilander
Operations Manager
Costa Mesa, Calif.

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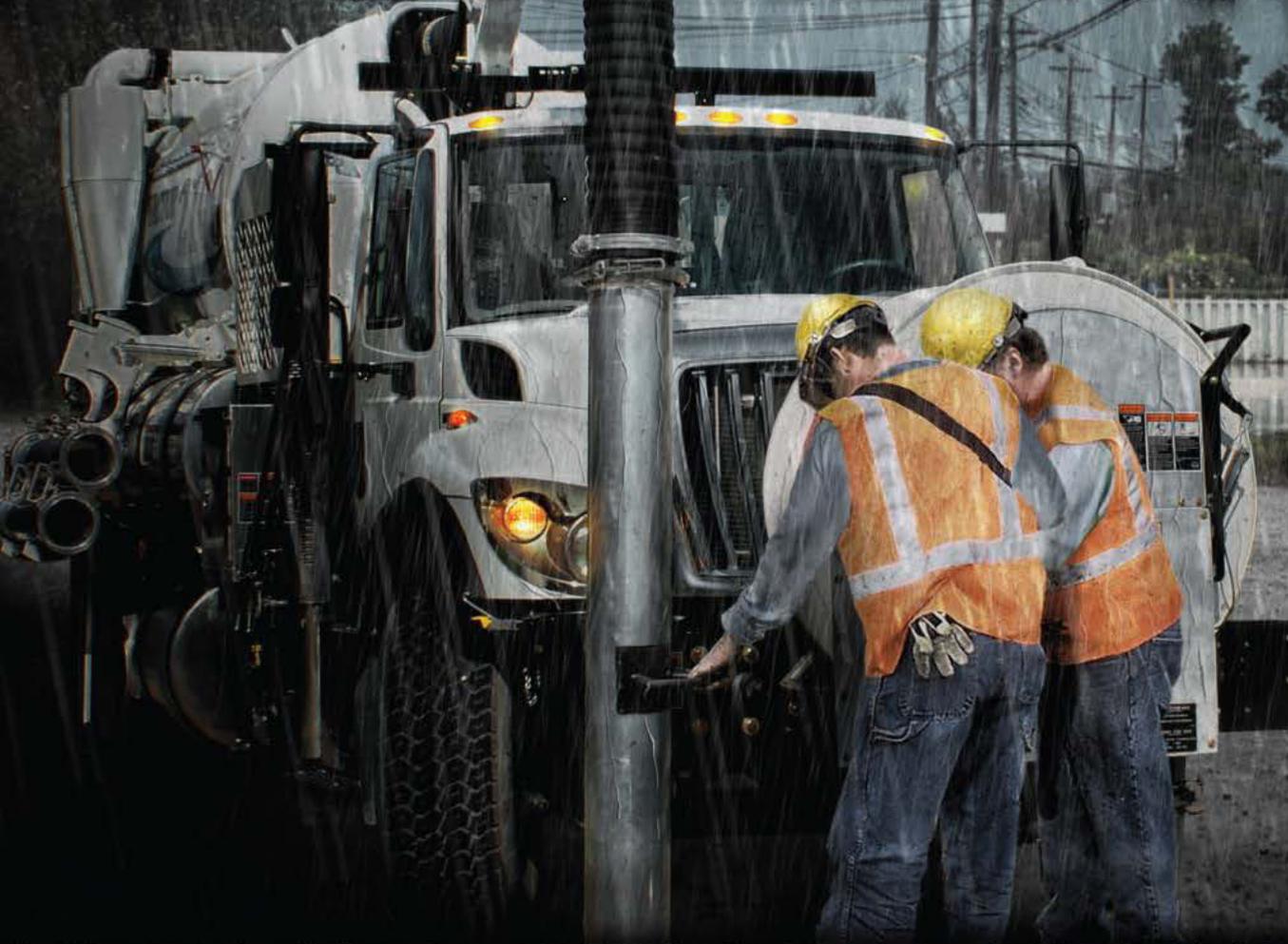


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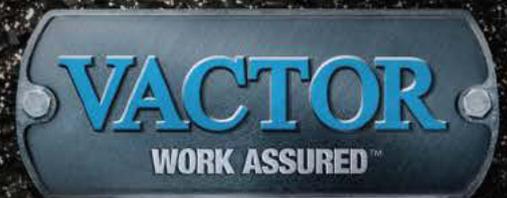
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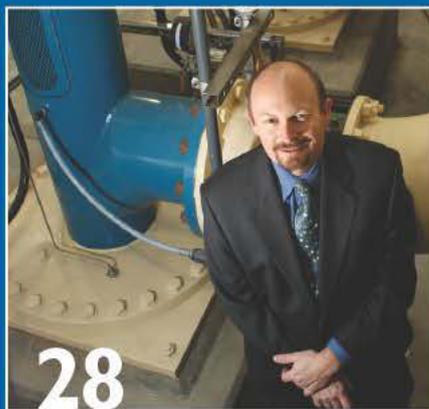
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FLOW CONTROL/MONITORING,
STORMWATER TREATMENT,
DEWATERING AND PRETREATMENT



ON THE COVER:

Mesa Water Operations Manager Jerry Vilander, at the Mesa Water Reliability Facility in Costa Mesa, Calif., has led his water utility to an exemplary record on maintenance and water loss elimination. The utility's proactive approach has shifted focus from emergency response and has cut non-revenue water to a minimum. (Photography by Christine Cotter)



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- ◆ Sewer: Knoxville tackles tough root problems
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JUNE 2013

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MAKING THE GRADE

The rebirth may be slow in coming, but America's infrastructure is showing signs of improvement

You've seen countless stories about how America's infrastructure is failing. Roads and bridges are crumbling, sewer systems are fouling waterways, and waterlines are leaking at alarming rates.

This time around, the news isn't quite so grim. The ASCE's 2013 Report Card for America's Infrastructure has been released and the results are slightly improved. Updated once every four years, this year's report card found that America's cumulative GPA for infrastructure rose slightly from a D in 2009 to a D+ this year.

It is estimated that the government will invest approximately \$3.6 trillion across the nation's 16 infrastructure sectors by 2020. Investments have been made since the 2009 assessment in six sectors, including solid waste, drinking water, wastewater, roads, bridges and rail.



FROM THE EDITOR

Luke Laggis

Key trends that drove those improvements included:

- Renewed efforts in cities and states to address deficient roads, bridges, drinking water and wastewater systems
- Private investment for efficiency and connectivity brought improvements in the nation's railways, ports and energy grid
- Several categories benefited from short-term boosts in federal funding

"A D+ is simply unacceptable for anyone serious about strengthening our nation's economy; however, the 2013 Report Card shows that this problem can be solved," says ASCE President Gregory E. DiLoreto, P.E. "If we want to create jobs, increase trade, and assure the safety of our children, then infrastructure investment is the answer."

The report card includes grades for specific infrastructure sectors. Drinking water and wastewater systems both improved slightly to a grade of D. Low grades in these sectors continue due to pipes and mains that are reaching the end of their life cycle and require significant investment, and large capital investment needs for the wastewater and stormwater systems to fix and expand pipes to address sanitary sewer overflows, combined sewer overflows, and other pipe-related issues.

This month's issue of *MSW* features some municipalities that have all made significant strides toward improving their infrastructure. Jersey City Municipal Utilities Authority in Jersey City, N.J., has taken on a massive CSO reduction project. The utility's sanitary and stormwater collection systems are almost completely combined, and CSOs have historically been a significant problem.

Under terms of a consent decree with the U.S. EPA, JCMUA is spending more than \$52 million to inspect, clean and upgrade its sewer system to prevent future releases of untreated wastewater into area water bodies.

Mesa Water, in Costa Mesa, Calif., has made impressive strides with its water distribution system. The district's proactive infrastructure maintenance and replacement program has brought its water loss rate down to almost nothing. When problems arise, pipes are replaced; they don't take a Band-Aid approach. They are also very proactive about the maintenance and replacement of valves and meters, which prevents problems that could otherwise sap the system's performance. The utility is currently ranked as "Excellent" by American Water Works Association audit standards, and it is very close to "World Class," the top ranking.

So even though a D+ isn't a grade to be proud of, it is an indicator of improvement in our overall infrastructure, and these two utilities are good examples of where that improvement is coming from.

The 2013 Report Card includes information for all 50 states and highlights initiatives and innovations that are making a difference.

Visit www.infrastructurereportcard.org to view and download the complete 2013 Report Card for America's Infrastructure.

Enjoy this month's issue. ♦



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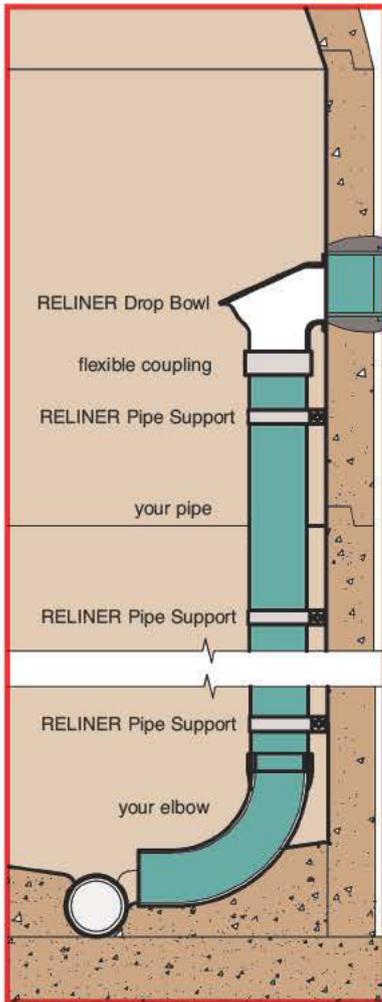
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EDITOR'S CHOICE

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By Luke Laggis

Our website got a new look this year, and we're packing it full of extra content you can't get anywhere else. In addition to everything you see on these pages, the site features a wealth of product and industry information, as well as original features you won't find in print. The following are just a few of the items you're missing if you're not visiting mswmag.com.

Sewer cleaning demo videos from 2013 Pumper & Cleaner Expo

For the first time at the Pumper & Cleaner Environmental Expo in Indianapolis this year, five companies performed live equipment demonstrations outside the Indiana Convention Center. Videos of the demonstrations, showcasing everything from pipe cutting to combination units, have all recently been posted online.

EDITOR'S BLOG:

Death sends a message: Don't take chances with hydrogen sulfide

Workers face many dangers in the underground world of wastewater. Sadly, the life of one young worker was taken recently after he was overcome by fumes in a large sewer pipe in Tampa, Fla. According to the Tampa Port Authority, seven workers were involved, and all were taken to the hospital after being overcome by fumes inside the pipe. Unfortunately, 33-year-old Jesus Jimenez died from inhalation of the hydrogen sulfide fumes.

Burbank Water and Power uses water for power

California's Burbank Water and Power (BWP) has provided water and electricity to the city's citizens and businesses since 1913. Having responsibility for both water and power allowed BWP to install two hydrogenerators at its Valley Pumping Plant in 2002. The high-pressure water is used to power two turbine generators, producing enough renewable electricity to run up to 200 homes. That same year, BWP also inaugurated an industry-first program for reclaimed water by installing a reclaimed water treatment system for its on-site power plants. The system displaces the need for any potable water to be used in BWP's power plants.

How much is excavation safety worth?

A Philadelphia plumbing company got hit with a \$40,000 fine in April for excavation violations while installing a residential sewer line. The OSHA violations included the lack of a protective system, no barrier for the spoil pile, inadequate training and failure to have a hazard communication program. That's an expensive bill for shaving a few minutes off a job.

Revamped public education campaign spurs watershed awareness in Southern California

By relaunching a new website and reinventing the face of its public education campaign, the Ventura (Calif.) Countywide Stormwater Quality Management Program has transformed the way residents understand stormwater management and watershed protection. Representatives from the 10 cities that comprise Ventura County and the Ventura County Watershed Protection District coordinate the program to inform residents. Information on Ventura County's four watersheds is included on the website, www.cleanwatershed.org. The site also features outreach materials for residents, businesses, teachers and students to take learning into their own hands.

Check out all these stories at
www.mswmag.com/ec/2013/June

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Building Innovative Tools for Municipalities

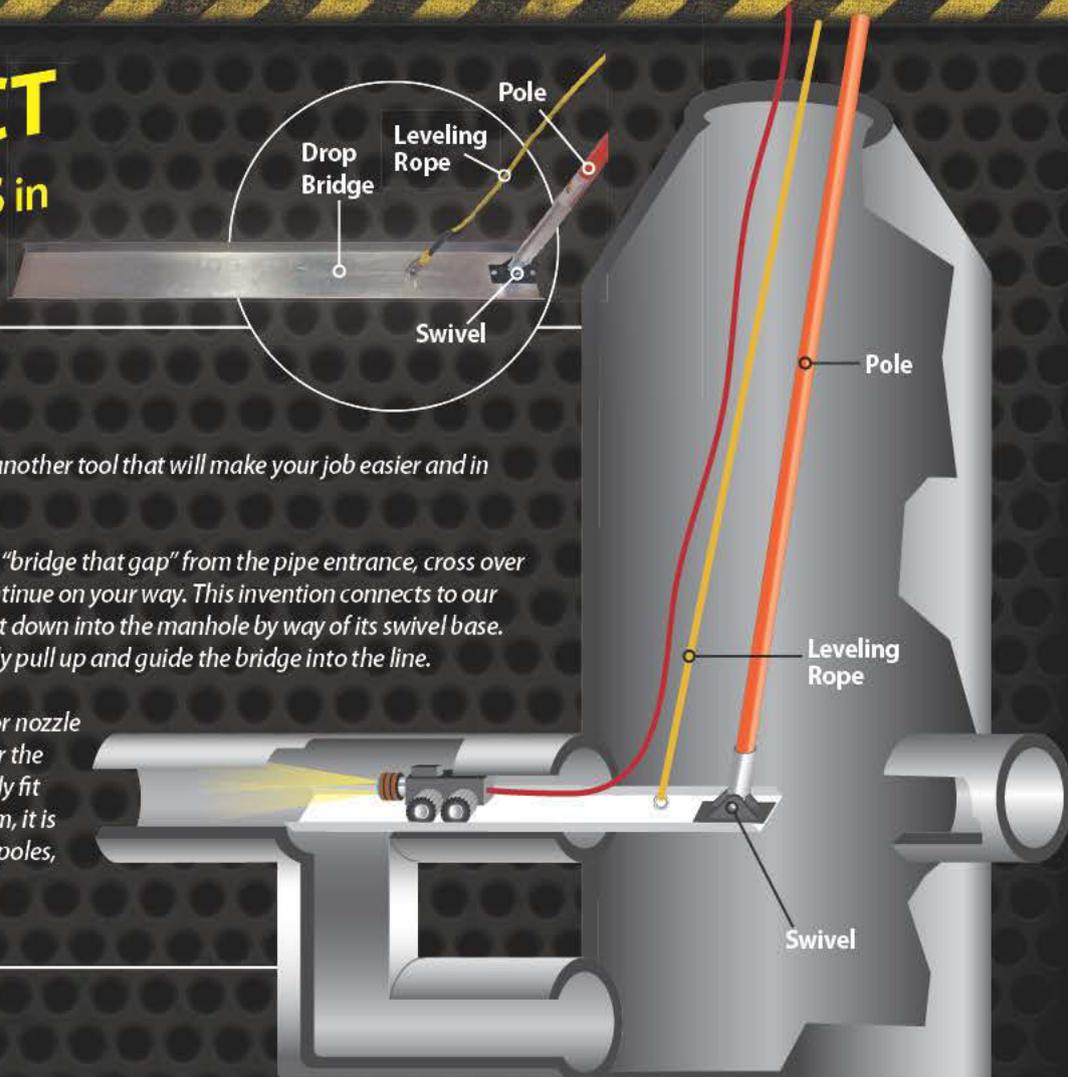


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Kingston's massive sewer and water main reconstruction project involved excavating two blocks from storefront to storefront in the heart of the downtown.

FOCUS: SEWER/WATER

BIG DIG IN K-TOWN

Kingston, Ontario, puts great emphasis on planning and consultation as it tackles a massive combined sewer replacement project

By Peter Kenter

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PHOTO COURTESY OF UTILITIES KINGSTON

Kingston, Ontario, is a city of 125,000 offering a vibrant downtown core with historic buildings, an attractive waterfront and a booming hospitality industry. After completing a sewer and water main construction project that saw two blocks of the downtown core excavated from storefront to storefront in the summer of 2010, Utilities Kingston is moving forward on phase two with a strategy that balances the urgency for infrastructure renewal with the needs of stakeholders.

Kingston's sewer and water system dates back as far as the 1800s. Water mains consist of materials including cast and ductile iron, concrete, PVC and HDPE. Sewer lines consist of concrete, clay, clay tile, PVC and HDPE. The main driver of the city's official Pollution Prevention and Control Plan is the need to address combined sewer overflows into the Cataraqui River. The primary target is the replacement of a 3/4-mile length of combined sewer along Princess Street.

"The combined system is a gravity-fed box sewer about 4 1/2 feet wide and 3 1/2 feet high carved out of limestone bedrock," says Jim Keech, president and CEO of Utilities Kingston. "It's more than a century old and shows an amazing eye for craftsmanship. They were so conscientious, they built them with stone archways capped by keystones that nobody would ever see again until they were exposed."

The city had also established a Downtown Action Plan designed to rejuvenate downtown streets, something that could be achieved on the back of the CSO project.

"We originally planned to do four to six blocks, then stay out of the way of downtown merchants and businesses for awhile," says Keech. "That met with a pretty cold recep-

(continued)



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Jim Miller, left, technical services manager, and Jim Keech, president and chief executive officer of Utilities Kingston, pose in front of the Vactor HXX hydroexcavator in the city yard in Kingston. (Photography by Eric Healey)

“On other projects we’ve discovered anything from contaminated soil to the remains of soldiers buried in unmarked graves. We let everyone know that if we found an oil slick from an old gas station or a stash of cannonballs, all scheduling bets were off.”

Jim Keech

tion. Some of those businesses have experienced flooding as a result of the combined sewer system and support the project, but deep down they hope it’s something we can achieve by coming in at 10 o’clock some night, and complete by the following morning.”

Planning for success

The utility decided instead to work closely with stakeholders on an initial smaller project, then use the lessons learned to begin the next phase. The plan-



PROFILE: Utilities Kingston, Kingston, Ontario

YEAR DEPT. ESTABLISHED:
2000

WATER CUSTOMERS SERVED:
36,000

AREA SERVED:
174 square miles

DEPARTMENT STAFF:
220

INFRASTRUCTURE:
385 miles of water mains;
260 miles of sewers

ANNUAL DEPARTMENT
BUDGET (2012-13):
Water and sewer operating
budget, \$13 million; capital
water budget, \$15 million;
capital sewer budget, \$20 million

ASSOCIATIONS:
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Association, Water Research
Foundation, Ontario Water
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iation, Water Environment
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ning, consultation and environmental approvals required more than twice as much calendar time as the actual construction, notes Keech.

Stakeholder meetings began early in 2008. Local businesses were promised at least one year’s notice of road closures to help them prepare.

“We debated whether we would start at the top of the system or the bottom,” says Jim Miller, director of Utilities Engineering with Utilities Kingston. “We decided it made more sense to start at the bottom. A project such as this requires the ability to manage the commingled system until the project is finished. As you move upstream and install separate systems, you’re dealing with a smaller and smaller volume of combined sewer flow.”

PUMPING STATION RENO YIELDS TIME CAPSULE

The City of Kingston is known for a military history that dates back to 1673. But an artifact dating back to 1957 has been the latest talk of the town.

While renovating a city pumping station, a contractor discovered a mysterious copper container behind the building’s cornerstone. The worker passed the object to Kevin Riley, director of water and wastewater operations, and Jim Keech, president and CEO of Utilities Kingston.

“It’s a copper box a foot-and-a-half long by 8 inches wide by 6 inches deep,” says Riley. “It looks like it was made out of copper flashing from the roof. Clearly someone went through a lot of trouble to seal it with solder. Rattling it around, it sounded like it contained metal coins and paper.”

Workers carefully removed the solder seal prior to a city council meeting and presented the artifacts. Among the contents of the capsule

- A list of contractors who worked on the \$4.3 million construction project;
- By-laws and council minutes related to construction of the station;
- A list of dignitaries who attended the cornerstone ceremony;
- A copy of a local newspaper, *The Kingston Whig-Standard*, dated December 20, 1957; and
- A 1957 penny, nickel, dime and quarter

Riley wants to see the contents of the capsule placed in a local museum.

“We’re also building a new head office for Utilities Kingston,” he adds. “I think we can devise a pretty interesting time capsule for people to find in the 22nd century.”



The initial endeavor was dubbed the Big Dig and targeted two blocks of Princess Street from the shore of Lake Ontario up, with side construction on one adjacent street.

As an asset manager, Utilities Kingston holds responsibility for water, sewers, gas and electricity. Each of the services it offers would



PHOTO COURTESY OF UTILITIES KINGSTON

The old gravity-fed box sewer below Princess Street, carved out of limestone bedrock, is more than a century old and was built with stone archways capped by keystones.

be upgraded, where necessary, during construction.

The utility fields an operations crew committed to maintenance and repair of sewer and water infrastructure. It owns a fleet of dump trucks and a few smaller excavators, and also operates a Vactor hydroexcavator and a sewer jetter by Super Products.

In-house crews conduct CCTV inspections of service laterals, stubs and short turns using a selection of push-and-track cameras by Pearpoint, (continued)

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Limestone sewers resist CCTV

Efforts to inspect the limestone sewers with CCTV cameras failed to shed much light on their condition.

"The camera was bouncing along the rough surface of the limestone, getting caught and splashing through sewage," says Miller. "We couldn't learn much more about it without exposing it."

Prior to excavation, the utility studied historic infrastructure maps and confirmed locations of city and customer infrastructure with ground-penetrating radar.

"We also performed our due diligence in terms of potential environmental and archaeological finds

"Handbills only go so far. I want to talk to people face-to-face so I can share a laugh with them and gauge their reactions to what I'm saying. They also have individual questions that can best be answered in person."

Adam Metcalfe

Len Corcoran Excavating digs trenches in Princess Street between Wellington Street and Kingston Street East. Utilities Kingston has contracted Len Corcoran Excavating to replace the sewer and water mains and storm drains through the lower section of Princess Street.

using test hole drilling," says Keech. "On other projects we've discovered anything from contaminated soil to the remains of soldiers buried in unmarked graves. We let everyone know that if we found an oil slick from an old gas station or a stash of cannonballs, all scheduling bets were off."

This was a unique project requiring both technical construction expertise and a major public relations component. It also required the contractor to devise a plan to provide consistent delivery and customer access for each business during the project. As a result, the project was issued under a Request for Proposal (RFP), with contractors aided by the utility's engineering team.

"City Council approves our rates and budgets, but we can generally plan on a three- to four-year capital budget," says Keech. "That allows us some freedom in purchasing decisions and issuing contracts."

Area contractor Len Corcoran Excavating submitted the winning bid of \$4 million.



Construction crews moved into the project zone on March 1, 2010.

Len Corcoran crews replaced the combined limestone sewer with 36-inch-diameter concrete storm pipe and a 12-inch PVC plastic pipe for sanitary.

"The 8-inch cast iron water line had an internal diameter of only 5 inches left, so we restored capacity by installing an 8-inch PVC pipe," says Miller. "Since we knew the dimensions of the limestone trenches, we realized that they still held some value for us. We used them to place

Len Corcoran Excavating crew, from left, Andrew Murphy-Greyhood, Dylan Cahil, Joal Hawkins, Jeremy Menzies, Aimee Austin, Shawn Major, Adam Metcalfe (co-project manager) and Bob Brooks pose in front of a CAT 308D CR operated by Jeff Allen.

either the new sewer and storm lines or the water mains, depending on the system design in that location.”

As promised, the road was excavated from storefront to storefront. Special protected pathways were established, allowing customers and delivery vehicles to access any business on the street.

Working with the effort, Kingston’s downtown business improvement association launched a campaign inviting shoppers to see “the oldest limestone sewers on Earth.” They offered Big Dig pricing and wore T-shirts sporting Big Dig logos and sun visors identified as “sewer-visors.”

When an excavator accidentally ruptured a water line, the construction company liaison immediately visited local businesses, explaining what had happened, and how long it would take to restore service.

“Our office didn’t receive a single call about the disruption to water service,” Keech says.

Miller notes that the sewer and water work was straightforward — it was the communications, traffic management and logistics of the construction site that consumed most of the effort. The project wound down in July of that year.

Big Dig 2 builds on experience

Armed with the experience of the original Big Dig, Utilities Kingston is embarking on the second phase of the project in 2013, moving two blocks upstream and extending to two cross streets. Len Corcoran Excavating again won the bid at \$6.2 million.

Initial project plans scheduled the work over two years, one block per year, beginning in the spring of 2013.

“The merchants told us that they wanted us out of the way on Princess Street by July 1, the beginning of the tourist season,” says Keech. “To accommodate them, we fast-tracked the project and moved up the construction date to February.”

Working in colder temperatures and spring rain required the contractor to erect tents and canopies over the construction site and provide heated water to local businesses, so that temporary supply lines wouldn’t freeze.

The new schedule, however, didn’t affect the contract price.

“The contract was tendered on a Request for Proposal basis with the price based on value engineering,” says Keech. “The dollar value of the work remains the same, even though the new schedule begins earlier. We’re planning to have Princess Street substantially completed by July, with work on the side streets continuing through the summer and finishing in 2014.”

Adam Metcalfe is the co-project manager for Len Corcoran, in charge of “out-of-the-fence” responsibilities, including the communications effort for Big Dig 2.

“We’ll be continuing with the personal approach,” he says. “Handbills only go so far. I want to talk to people face-to-face so I can share a laugh with them and gauge their reactions to what I’m saying. They also have individual questions that can best be answered in person.”

Metcalfe is looking for an office location in one of the buildings lining the street.

“We’re not using construction trailers that could block the site lines to a business across the street,” he says. “If we expect businesses and residents to put up with construction, we’d better be prepared to

make some concessions, too.”

When work finishes up next year, Keech says he’ll already be drafting potential plans to complete the remaining five blocks of the Princess Street CSO project.

“All we’re saying at this point is that we’ll spread the work over more than five years, but fewer than 10,” he says. “Some stakeholders would like some time off, but I’d like to be a little more aggressive and bite off a bigger project. However, we need to balance what works best from an engineering standpoint against the concerns of the community.” ♦

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Aries Unveils Side-Scanning Camera System at 2013 Expo

By Craig Mandli

Aries Industries introduced the company's **PM6000** side-scanning sewer and drainline inspection camera system at the 2013 Pumper & Cleaner Environmental Expo held Feb. 25-28 in Indianapolis, Ind. More than 8,418 people representing 3,730 companies attended the annual event geared toward professionals in the septic, sewer cleaning and portable sanitation industry.

The PM6000 system is designed to provide municipalities and contractors with an adaptable, cost-effective solution generating flat view and video inspection images. According to Aries Chief Technology Officer Mike McGrew, the system improves productivity with rapid inspections and accurate, detailed condition assessments. The prospect of increased efficiency caused many Expo attendees to take note.

"I'd say the PM6000 went over extremely well at the Expo," says McGrew. "We put a year and a half into the research and development of this product, and were pretty excited to have it at the Expo. A lot of the people I



Chris Schneider explains the features of the new Aries PM6000 side-scanning sewer and drainline inspection camera.

talked to were intrigued by the time it could potentially save doing sewer and drainline inspections."

The camera provides simultaneous full-motion video and lay-flat inspection images using a virtual pan-and-tilt display. It is designed for high-resolution inspection of lined 6-inch and larger sewer and drainlines. The system is plug-in compatible with existing Aries systems and fits on several types of Aries tractor transporters designed for use in multiple environments. McGrew pointed out that the system integrates easily with industry-standard software and has several other features that make it efficient for use in inspection and repair operations.

"With traditional pan-and-tilt camera systems, operators slowly inspect lines, stopping to examine each defect one at a time to create a record, which takes substantial time and creates possible inconsistencies," says McGrew. "With the PM6000, the operator just sets the camera on the tractor and lets it inspect the whole pipe. The entire video is processed to provide an easy-to-read, lay-flat view of the inside of the pipeline, making defects simple to spot. One technician can handle the entire process."

The system integrates easily to multi-conductor or single-conductor Aries systems, and captures industry-standard NTSC high-definition video files for full motion viewing. The lack of moving camera parts also improves reliability.

"It's a great combination of our new and existing hardware and software," says McGrew. "The camera is higher resolution than we've ever used before, and the software is cutting-edge, so the final record is extremely accurate. Between that and no longer having to treat the pipeline defect by defect, municipalities and contractors will see a big increase in consistency and productivity."

McGrew said that several of Aries Industries' longtime customers were excited to see the PM6000 prototype in Indianapolis.

"A few knew we've been working on a side-scanning camera, and our booth was the first place they stopped in Indy," says McGrew. "We sold several units right there at the show, and have many other interested parties to follow up with. We were excited to gauge the reaction from the crowd, and it actually exceeded our expectations. Everyone in our Indy crew is pleased." 800/234-7205; www.ariesindustries.com. ♦

"We put a year and a half into the research and development of this product, and were pretty excited to have it at the Expo. A lot of the people I talked to were intrigued by the time it could potentially save doing sewer and drainline inspections."

Mike McGrew

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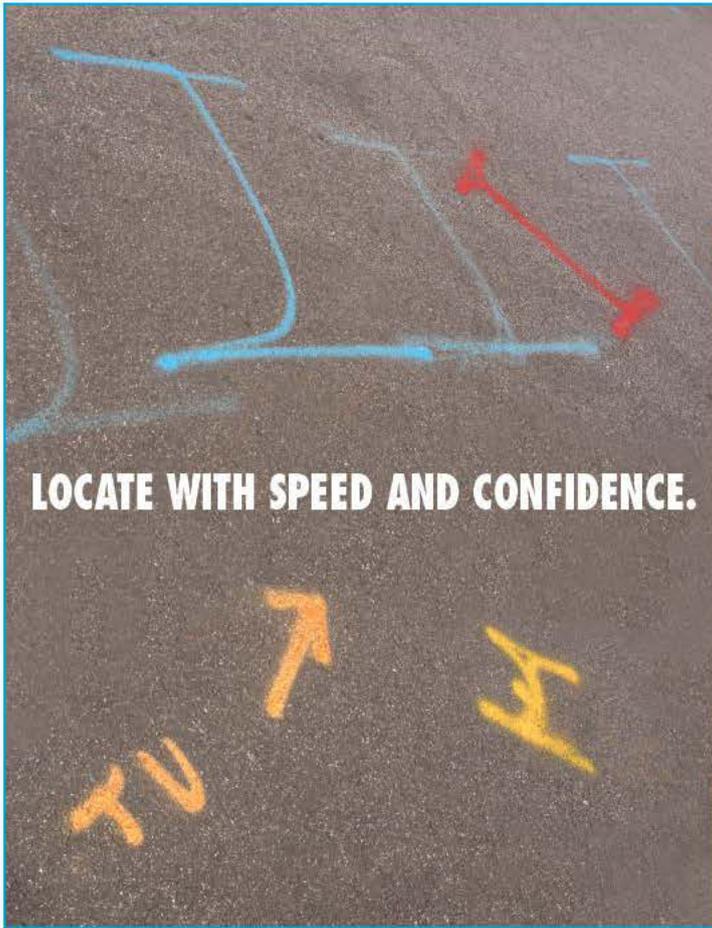
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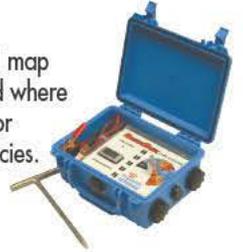


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FOCUS: STORM/SEWER

COMBINED SEWER OVERHAUL

Jersey City takes on a massive multi-year effort to improve its collection system, increase capacity, and eliminate CSOs

By Jim Force

Faced with an EPA consent decree and plagued for years by sewer back-ups, the Jersey City Municipal Utilities Authority is engaged in a comprehensive effort to inspect, clean and repair its aging 230-mile-long sewer system. New camera inspection technology is helping.

“Our new CUES-IMX truck-mounted camera enables us to inspect sewer lines much faster and more cost-effectively than with the older camera units,” explains Richard Haytas, Jersey City MUA district engineer whose responsibilities for the project keep his phone ringing and schedule chock full. CUES has partnered with InfraMetrix to develop the system. The camera offers a 25:1 optical zoom, remotely controlled by a telescopic boom.

Haytas says his crew especially likes that the camera unit is pole-mounted, avoiding the need to clean the pipe before it is inspected, as was the case with older crawler-mounted units. Plus, it can zoom as much as 150 to 200 feet down a pipe, enabling MUA personnel to shoot an entire line from two manholes — one upstream and one down-

stream. “The image is much clearer (compared to older methods) and the magnification is better,” says Haytas. “It saves a lot of time.”

Jersey City MUA

Jersey City, population 250,300, is the second largest city in New Jersey, and lies across from Lower Manhattan between the Hudson River and Upper New York Bay, and the Hackensack River and Newark Bay.

The Jersey City MUA has provided water, wastewater and solid waste services to the city since its founding in 1949. Almost all of its sewers are combined, with 21 CSO overflow points.

Two older wastewater treatment plants within the city are no longer in operation, and the authority pumps approximately 50 million gallons of wastewater a day beneath Newark Bay to the regional Passaic Valley Sewerage Commission facility in Newark for treatment.

Portions of the sewer system are more than 100 years old, and the pipes consist of a wide variety of materials including cast iron, vitrified clay, riveted steel, reinforced concrete, circular and oval brick, and heli-elliptical. In some sections of the city, wood sewer lines still exist.



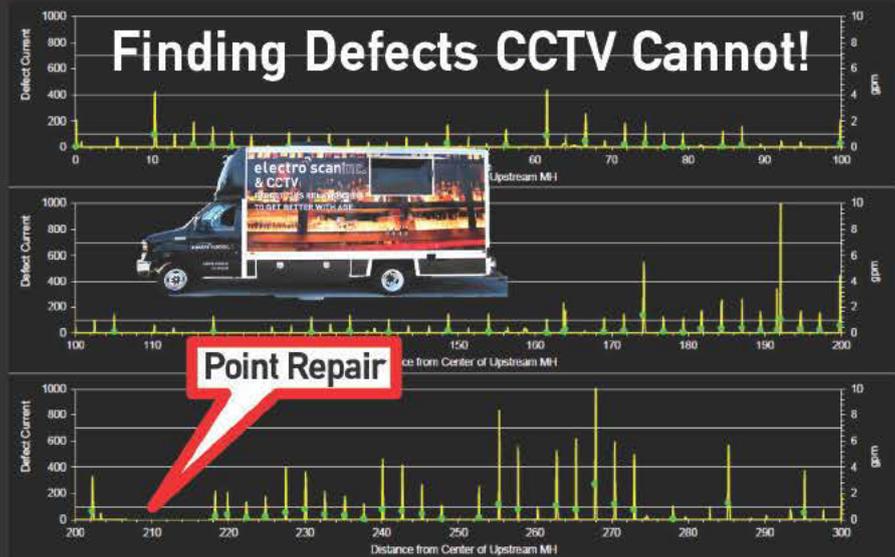
CCTV truck operator Salvatore Long adjusts a tube to reduce steam and increase visibility for the CCTV supervisor during a sewer inspection. (Photography by Lauren Casselberry)

(continued)

2013 Product Innovation of the Year*



* NASTT No-Dig Joseph L. Abbott, Jr. Award Recipient.



(Above) Sewer agency used CCTV to locate a defect that was determined to require a Point Repair at 210 feet. A Point Repair was completed and the Contractor used CCTV to certify the repair. Then, the pipe was **Electro Scanned**.

Good News: The Point Repair was successful -- no electrical readings!

Bad News: The Sewer Pipe had numerous other defects not seen by CCTV.

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1	Automatically Finds Potential Sources of Infiltration	N	Y
2	Automatically Finds Leaks Inside Joints	N	Y
3	Automatically Finds Leaks at Service Connections	N	Y
4	Automatically Finds Sources of Infiltration at Cracks	N	Y
5	Automatically Finds Leak Locations (within 0.4 in or 1 cm)	N	Y
6	Automatically Measures Size of Leaks (Est. GPM or LPM)	N	Y
7	Automatically Finds Defects That Leak from Bad Couplings	N	Y
8	Automatically Finds Defects That May Still Leak After Repairs	N	Y
9	Automatically Finds Defects That Leak in Re-Lining Projects	N	Y
10	Automatically Finds Defects After Service Re-Connections	N	Y
11	Automatically Finds Leaks, If Silt or Debris on Bottom of Pipe	N	Y
12	Able to Conduct Inspections, If Sewer Pipe Is Full of Water	N	Y
13	Able to Determine Size of Potential Leak, If Roots Are Present	N	Y
14	Automatically Finds Leaks at Joints, If Grease Is Present	N	Y
15	Able to Determine Size of Leaks, If Pipe Has Encrustation	N	Y
16	Requires Active Infiltration to Identify Defect at Source	Y	N
17	Contains Moving Parts That Could Clog from Debris or Silt	Y	N
18	Requires Bypass During Inspection, If Pipe Full	Y	N
19	Requires Special Training and Certification to Identify Defects	Y	N
20	Relies on Visual Observations to Record Defects	Y	N
21	Ave. Speed of Inspection (6-20" Sewer Main)	3ft / min	50ft / min

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From left, Jersey City Municipal Utilities Authority employees Philip Muzzo, instruction supervisor; Richard Haytas, district engineer; Daniel Becht, executive director; and Marc Borg, CCTV supervisor, with the city's CCTV truck and three of the city's five Camel vacuum trucks (Super Products).



PROFILE:

Jersey City, N.J., Municipal Utilities Authority

FOUNDED:
1949 (as Jersey City Sewerage Authority)

SERVICE AREA:
City of Jersey City,
approximately 21 square miles

POPULATION SERVED:
250,300

INFRASTRUCTURE:
230 miles of sewers (mostly
combined); 5,000 catch basins;
21 CSO overflow points;
two pumping stations which
transport 50 mgd of wastewater
to the Passaic Valley Sewerage
Commission facility; 240 miles
of water pipes; one water
treatment plant operated by
United Water

EMPLOYEES:
100

**ANNUAL OPERATING
BUDGET:**
\$53.85 million

WEBSITE:
www.jcmua.com

**“During heavy rains,
stormwater would simply
overwhelm our pipe
capacity and trigger
discharges into surface
waterways. A storm of an
inch an hour maxes out
our sewers. There’s no
place for the water to go.”**

Richard Haytas

Under terms of the agreement with the federal government announced in July 2011, MUA is spending more than \$52 million to inspect, clean and upgrade its sewer system to prevent future releases of untreated wastewater into area water bodies. The agreement specifically calls on the MUA to repair 25,000 feet of sewer lines over the next eight years, and to invest \$550,000 into a project that will remove privately owned sewers from homes in several city neighborhoods and replace them with direct sewer connections. The construction schedule actually coincides with the authority’s 10-year master plan.

The project is designed to remedy a history of CSO events that led

SLUGGED BY SANDY

If the Jersey City Municipal Utilities Authority didn’t have enough on its hands, Hurricane Sandy added to the task. The late October storm caused a surge in the Hudson River that flooded the utility’s pumping stations and pushed silt into its discharge lines, effectively blocking them.

“We have a number of outfall pipes that go into the river,” reports Richard Haytas, Jersey City MUA district engineer. “The storm surge in the Hudson brought a lot of silt into the system. We had to aggressively hire a contractor to clean out the pipes, and used divers in certain areas to inspect pipes where problems existed.”

Haytas says the surge knocked out the generators in several pump stations located along the Hudson. “We had to manually bring in bypass pumps to prevent sewage from backing up into streets or people’s basements.”

In addition, wastewater discharge to the large regional Passaic Valley Sewerage Commission treatment facility in Newark was suspended for 24 hours because that facility was underwater and their overflow chamber was full. The situation forced the Jersey City MUA and a number of other area wastewater utilities to discharge directly to the Hudson River for about 24 hours.

All told, the storm disrupted power to about 75 percent of the city, but the city’s drinking water supply was not disrupted.

to repeated violations of the Clean Water Act and sewer backups. “During heavy rains, stormwater would simply overwhelm our pipe capacity and trigger discharges into surface waterways,” explains Haytas, a 16-year veteran of MUC. “A storm of an inch an hour maxes out our sewers. There’s no place for the water to go.”

In addition, high tides along the Jersey City shoreline can often prevent the water from passing through outfalls to the river, causing sewer backups. “We have a lot of residences where basements serve as living areas,”

Haytas says. That became such an issue that city ordinances now prohibit living quarters such as showers or bedrooms below street level.

Progress report

According to Haytas, the MUA is well along on its path to clean and inspect all of its lines, and to identify and bid out the many construction projects that will ensue. “We’ve divided the overall project into seven phases,” he explains. “We’re now working on phase six.”

Each phase consists of between 1,000 to 1,500 manholes. MUA is

(continued)

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Vacuum truck operators Eddie Rivera, left, and Teddy Boatwright use a Camel vacuum and jetter system (Super Products) to clean a sewer line at the Reliable Paper Recycling facility in Jersey City.



Executive Director Daniel Becht with the city's CCTV truck, equipped with a CUES-IMX truck-mounted zoom camera.

using the NATCO grading system to identify and classify pipe issues: from 1, meaning the pipe is in good shape, to 5, which indicates the pipe is beyond its useful life.

Haytas says inspection of the first four phases is complete, and after the authority analyzes which sewers need to be cleaned and/or replaced, bids are being let to outside contractors.

"We have awarded the contract for the Sixth and Tenth Street projects," he says, noting that work should commence this spring and summer. Some of the sewer lines in these areas are scheduled for replacement, and some for relining using the cured-in-place method. Haytas says this work — estimated to cost just over \$2.5 million — will require bypass pumping as well as extensive traffic control.

Subsequent projects — Brown Place, Sipp, Duncan and Newark avenues — have been awarded to engineering firms that are now putting specifications together and conducting survey work. Work on these projects is expected to be finished in the 2014-2015 time frame.

Another large project — Grant Street — is ticketed for 2019.

Cleaning and inspecting

Cleaning and inspecting the sewer system is essential to the Jersey City project. The authority has

two camera units — a 2005 model that uses a CCTV camera mounted on a crawler, and the new IMX unit. Both are in operation 24/7.

"Years ago, when we just had the older unit, we would have to clean a section of sewer line before we could TV it, in order for the crawler to be able to get through," Haytas explains.

"The new truck is a one-man operation. You zoom up the line, and down the line, and you have a complete inspection of the pipe."

Haytas says the sharper images produced by the new truck are helpful in the reports he and his team must prepare for the EPA.

"We're using the new IMX unit for the EPA work, and putting the older unit to work on day-to-day issues like sewer collapses and new connection tie-ins," he says.

The MUA is using the same methodical approach to cleaning its sewer system. Using its Jet-Vac jetter-cleaner unit, the authority is concentrating on areas known to be problematic. "Over the last 16 years or so, we know where we have flat pipes or restaurants, and spots where we constantly gets calls," Haytas says. "Now we're doing cleaning and maintenance on those areas before problems occur."

There are about 300 areas like this, Haytas reports, and MUA can get to these areas between two and three times a year. "Once we're done, we start again," he says.

Haytas says MUA can't use the Jet-Vac unit on pipe sizes larger than 36 inches, and instead employs three



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Stetco Dragon machines that pull a 24-inch bucket through a pipe, raise it to street level, and dump the contents into a pickup truck. "We can't do this in winter because of slippery conditions on the streets," he explains. "But we start dragging in April and run all the way up until October."

The authority's 5,800 catch basins are cleaned by a fleet of five Stetco jetter-bucket trucks.

Results are positive. Haytas says the authority might get 15 to 20 calls a day prior to the cleaning program, but now the dry weather rate is around five calls a day. "And some of these are homeowner problems, or caused by a utility cave-in," he says.

Future capacity

In a related project, the Jersey MUA will make use of one of those abandoned treatment plants after all.

"We're rehabbing the sedimentation basins in the old East Side plant on Camille Avenue so they can be used for storage," Haytas says. "The plant has been out of service for 20 to 25 years, but it's still there. Together with T&M Associates, our engineering consultant, the EPA and the New Jersey Department of Envi-

ronmental Protection, we're working to convert it into a stormwater storage and pumping station."

The basins will give the authority more capacity to handle storm flow and help it meet its goals of reducing or eliminating surface water overflows and discharges. ♦

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PULLING THROUGH

Sliplining is a capable, effective and efficient method of rehabilitating failing sewer lines

By Kimberly Paggioli

As many municipalities strive to repair their aging infrastructures, agencies must evaluate a variety of methods for their ability to extend service life in reliable and cost-effective ways. One widely used alternative to renew pipelines is segmental sliplining. There are many advantages to rehabilitating pipelines by this method. Renewing older infrastructure can restore the structural strength, often maintain or increase hydraulic capacity, prevent further corrosion and substantially decrease or eliminate infiltration and inflow in the sliplined area.

“Sliplining is a well-established, proven and cost-effective rehabilitation method, which has been used in North America for over 60 years,” says Erez Allouche, Ph.D., P.Eng., executive director of the Trenchless Technology Center at Louisiana Tech University.

Typically, installing gasket-sealed pipe segments into the sewer under “live” conditions eliminates the cost and risks of bypass pumping. Pipes can be quickly and easily inserted through small access shafts, and laterals can be reinstated via small point excavations. Grouting may require only minor or no further excavations. Grouting the liner sections will prevent migration of soil and water into the annulus, effectively transfer loads to the liner, and may stabilize bedding voids in close proximity to the host.

Preparation is essential

As with any type of construction, especially trenchless installation, preparation is essential. The more thoroughly the existing conditions are evaluated, the higher the likelihood of success. In sliplining, it is necessary to consider veri-

fying true line size, grade and alignment. Planning a sliplining project involves researching existing offset joints, unforeseen or uncharted angles, laterals or even location of manholes, etc. Proper cleaning is necessary for easy and smooth insertion of the liner pipe. A pre-insertion video can be a tremendous asset in locating potential obstacles such as roots, incrustations and protruding laterals.

The possible length of an individual sliplined reach will depend on many things, including the line orientation and the chosen liner pipe material. It’s well worth the effort to use test sections or mandrels prior to inserting the liner to verify fit. In good conditions, with proper fit, straight alignment and optimal flow conditions, pipes can be pushed very long distances.

“On one installation that began midday and ended in the late afternoon when the flow was theoretically higher, a marked decrease in flow depth occurred. It was obvious that the decreased flow depth from the start of the push until completion was directly related to the increased hydraulic capacity of the liner pipe.”

David Ellett

There are a variety of reasons for undertaking sliplining projects, including returning the pipe to a structurally safe state, preventing leakage and providing a corrosion-resistant line for the long term.

Structural considerations for sliplining are both short- and long-term. The structural integrity of the host must be established, and must be stable, at least temporarily, during the sliplining. Post-lining structural considerations include the ability to resist the external loading conditions in the long term, but sometimes the more critical capability to resist the grouting pressures during installation must

be calculated. Although the grouting pressure is very often a short-term loading condition, it is often more critical than the long-term loading conditions such as overburden and live loading from traffic. Depending on the liner pipe material chosen, heat of hydration of the grout may also be a consideration. “Fiberglass pipes, being made of thermosetting resins, have the necessary temperature resistance and the high-stiffness designs allow for increased factors of safety during grouting,” says Rene Garcia, EIT, engineering supervisor with HOBAS Pipe.

The pipe’s ability to resist buckling induced by the grouting pressure is a function of the pipe stiffness and to some degree the relative sizes of the host and liner. The relative sizes determine the degree of

excessive treatment of sewage from infiltration and the need for facilities to handle this increased and possibly excessive flow, there is the potential damage to streets, buildings or other structures the lines pass below.

Engineers attributed a collapse of a sewer in Houston, Texas, to years of soil migration into the joints and cracks in an existing line. Paul Wallick, P.E., with IDS Engineering Group, explained that years of groundwater infiltration had carried fine soils through small cracks in the MCIP pipe, and this had weakened and compromised the native soil to a point of failure. As the embedment worsened, additional cracks developed, causing more infiltration and continuing the vicious cycle. “The cyclical failure process deteriorates bedding strength,” Wallick says.

constraint offered to the liner pipe during grouting. Research is ongoing in this area to determine the support offered to the liner; however, several formulas currently exist to provide estimations (e.g. ASTM F1216-93). Liner pipe manufacturers can provide buoyancy calculations and maximum grouting pressures for each particular application. In larger-diameter pipes, depending on flow depth, they may recommend a multi-phase grouting process to prevent buoyancy.

Leading to collapse

Leaking lines create many problems for a municipality. Aside from

Leaking lines can also potentially cause blockage of sewer lines due to buildup of the soil or other materials that were “carried” in with the leakage. The handling of wet-weather overflow can create environmental concerns for the project, compromising safety, not to mention provoking fines. In order for sliplining to be technically viable, the existing embedment must be deemed adequate and stable or be restored.

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Improving flow capacity

If, after evaluating the existing line, sliplining seems a reasonable choice for rehabilitation, the next qualifying factor usually relates to hydraulics. Can a smaller-diameter pipe actually maintain or increase the flow capacity? The answer is "yes." In many cases involving larger-diameter pipe, this is entirely possible. Sliplining does decrease diameter, but this is usually offset by the much-improved hydraulics of the new liner pipe relative to the deteriorated existing pipe. Especially in larger diameters, it is not only possible, but also typical, to achieve higher flow capacity once the line has been rehabilitated. Maximizing the new inside diameter increases hydraulic capacity.

"On one installation that began midday and ended in the late afternoon when the flow was theoretically higher, a marked decrease in flow depth occurred. It was obvious that the decreased flow depth from the start of the push until completion was directly related to the increased hydraulic capacity of the liner pipe," says David Ellett,

project manager with BRH-Garver of Houston, Texas.

When comparing different materials for trenchless installation such as sliplining, it is important to consider the total installed "life cycle" cost of the project. A true cost comparison must also consider the costs incurred or avoided throughout the design life of the sewer. The total cost includes expenses accumulated over the study period to operate the system, maintain it, repair it (if necessary), and ultimately replace or rehab it, not just to purchase and install it.

With thorough evaluation of a system's requirements, repair alternatives and the cost of each, and their long- and short-term benefits, many future repair or replacement costs can be deferred or even avoided to the satisfaction of a municipality's Public Works budget. ♦

About the Author

Kimberly Paggioli, P.E., is the vice president of marketing and quality control for HOBAS Pipe USA.

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FOCUS: WATER

CONSERVE AND COMMUNICATE

Mesa Water boosts reliability through systematic improvements and a well-planned outreach program that preaches wise water use

By Jim Force

Mesa Water stands for the Mesa Water District in Costa Mesa, Calif. It could also stand for reliability, as the district has adopted a number of practices that essentially guarantee a continuous supply of high-quality water for its customers.

The district has implemented a proactive infrastructure maintenance

program, preaches efficient water use, attacks leaks, and has constructed a brand new water treatment plant, the Mesa Water Reliability Facility (MWRF).

According to Jerry Vilander, district water operations manager, Mesa Water is completely self-sufficient in terms of its water supply, which is drawn from the groundwater aquifer: "We're able to supply 100-percent

local water," he says. "We do not need to rely on outside water except as a secondary source."

Mesa Water

Mesa Water was formed in 1960 to provide water to the growing population of Costa Mesa, portions of adjacent communities and the John Wayne Airport near Newport Beach. Today, it serves approximately 110,000

residents, plus millions of visitors.

Its raw water comes from the Orange County groundwater basin, pumped from eight wells, each capable of producing between 1,800 and 2,400 gallons per minute. Water from two of the eight wells is slightly amber-tinted — believed to be caused by ancient redwood forests buried far beneath the surface, Vilander explains. While the color

OPPOSITE PAGE: The Mesa Water team includes, back row, from left, Eddie Nunez, Brett Rinella, Detlef Goris, Stan Kennedy, Steve Bancroft and Frank Schaefer. Front row, from left, Carrie Fesili, Bob Mitchell, Richard Ybarra, Scott Sullivan, Scott Peca, Alfred Mondragon, Darryl Hopkins, Roger Demers, Randall Winters, Alan Cook, Steve Hershey, Tracy Manning and Dave Hayton. **RIGHT:** System operator Bob Mitchell performs water quality testing at the Mesa Water Reliability Facility. (Photography by Christine Cotter)

has no impact on the quality or safety of the water, it is removed in the MWRF, which includes a nanofiltration system.

Rated at 6,000 gallons per minute, the improved MWRF (see sidebar) processes about 50 percent more water than the previous ozonation plant, while using less energy per gallon. It also assists groundwater cleanup by preventing the tinted water from migrating into the clear water zone above it.

Finished water travels to the community through a 350-mile-long distribution system, consisting of pipes ranging in diameter from 6 to 42 inches. The system includes 3,800 hydrants and 5,400 valves. Two reservoirs provide 9 and 18.7 million gallons of storage capacity, respectively.

Proactive maintenance

While one goal of Mesa Water is having a completely self-sufficient water supply, a companion standard is providing unblemished service to its customers. Water utilities can only achieve such a record if their infra-

structure functions flawlessly — a condition requiring diligent maintenance, including proactive preventive measures.

It's a perfect description of the Mesa Water program, which the staff refers to as "perpetual infrastructure renewal."

Kurt Lind, district business administrator, explains: "When we talk about infrastructure here, we're talking about a complete plan to maintain all our infrastructure and replace our assets as necessary. This ensures that our water system is in great shape. It's not just maintaining and replacing infrastructure, but it's also maintaining accurate records of work that helps us improve our operations through performance measures."

Mesa Water's computerized maintenance management system (CMMS) is called "MaintStar," and was selected following a competitive bidding process among a number of outside contractors. It's about seven years old now.

"We performed a needs assessment," says Lind. "We evaluated our



PROFILE:

Mesa Water District, Costa Mesa, Calif.

FOUNDED: 1960

SERVICE AREA: 18 square miles, including the City of Costa Mesa, parts of Newport Beach, and some unincorporated areas of Orange County



POPULATION SERVED: Over 110,000

INFRASTRUCTURE: 350 miles of pipe (6- to 42-inch diameter; ductile iron steel and PVC); 3,800 hydrants; 5,400 valves; 8 groundwater wells delivering 18,000 acre-feet per year to the system; 1 water treatment plant rated at 6,000 gpm; 2 storage reservoirs rated at 18.9 and 9 million gallons

EMPLOYEES: 23 in operations

ANNUAL OPERATING BUDGET: \$37 million

WEBSITE: www.mesawater.org

KEEPING CUSTOMERS INFORMED AND INVOLVED

On the technical and operational side of things, Mesa Water is doing everything it can to ensure its customers receive high-quality water, cost-effectively.

On the communications side, it is employing innovative programs to make sure its customers understand the value of that water.

"Water is a precious resource," says Stacy Taylor, Mesa Water communications manager. "We are proud of our ability to achieve 100-percent local water reliability, but people quickly forget. Water is treated as a commodity. As an agency, we don't think the value of water is communicated effectively in our industry."

Mesa Water uses most of the conventional public information techniques — a website, mailings and public events among them — but also engages in other more creative ways to involve the public.

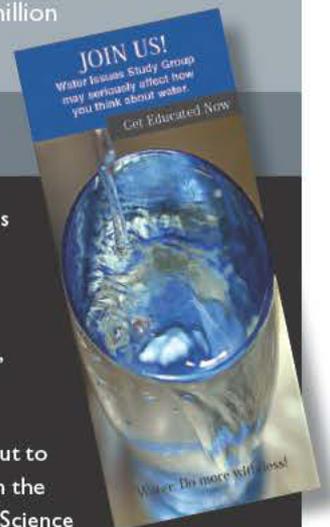
One is the "Water Issues Study Group." It's not new — Mesa Water has been conducting this program for 27 years — but it's innovative. It consists of a series of classes, conducted once a month on Wednesday evenings for four consecutive months. About two dozen individuals from all walks of life participate and learn how water is treated, how it's distributed, and discuss water quality and water use efficiency among other topics.

When the attendees graduate from the class after four months, "they become educated, empowered ambassadors for wise water use in our community," Taylor says.

The district even maintains an "alumni" group, hosting an annual gathering of folks who have graduated from the Water Issues Study Group.

In another program, Mesa Water reaches out to elementary students through a partnership with the local school districts and the nearby Discovery Science Center. Working with these partners, the district has developed a water curriculum — based on California state science education standards. One of the highlights of the school program is an interactive assembly involving every fifth grader in Mesa Water's service area. "The kids play the part of molecules, or of fish, and all get a bag full of items that remind them to use water wisely," explains Taylor.

Both programs have won numerous professional communications organization honors, including the 2012 PROTOS Award from the Orange County chapter of the Public Relations Society of America.





A Mesa Water District crew repairs a 16-inch water line.

“When we talk about infrastructure here, we’re talking about a complete plan to maintain all our infrastructure and replace our assets as necessary. This ensures that our water system is in great shape. It’s not just maintaining and replacing infrastructure, but it’s also maintaining accurate records of work that helps us improve our operations through performance measures.”

Kurt Lind

operation as a business — how we were operating, where we could improve — and found a system that met our specific needs.”

The CMMS tracks all labor, equipment and material requirements, and forms an annual work plan, complete with specific goals to be accom-

plished each month. It also sets performance indicators — how long it takes to turn a valve, for example.

Progress is monitored through biweekly meetings to schedule tasks with all supervisors, and monthly meetings to monitor progress toward established goals. Mesa Water compares its cost of performing work such as valve replacement or valve maintenance to contractor pricing to ensure the district remains cost-competitive and delivers quality work to its customers. “It’s a great Mesa Water business practice that allows us to measure our performance internally to our planned costs and externally to contractors’ cost,” Lind says. “It’s how we deliver value to our customers.”

The data gathered and generated by the process is critical as well. “This is a challenge to water systems,” observes Vilander. “Sometimes they have no real data to back up their actions, no formal tracking system. Our system delivers QA/QC data we then use to prove the excellence of our operation to our board and to our customers.”

THE “MURF”

The new Mesa Water Reliability Facility (MWRF, or “Murf” for short) allows the district to provide 100 percent of its customers’ needs from local water sources.

And as important as that is, it does even more. Opened in December 2012, the new nanofiltration facility produces more water than the old ozonation plant it replaced, and does it better and less expensively.

“We are getting great water quality,” says district engineer Phil Lauri. “It’s softer and the color removal is more effective. Plus, the new plant is more energy efficient, and is designed to facilitate for future expansion.”

The process has won awards and the admiration of visitors — some from overseas. Incoming groundwater first passes through a sand separation system that provides 25-micron removal, then flows to 1-micron cartridge filters and finally to the two nanofiltration trains, each designed for 3,000 gpm and operating at 80 psi. The membranes are Hydranautics (a Nitto Denko company), and the trains are from BiWater.

The permeate from each train is combined and the pH of the effluent stream is lowered with carbon dioxide. Finally, an air stripper removes methane and hydrogen sulfide, chlorine is added, and the finished water is pumped to the distribution system. Caustic is used to raise pH and optimize the chlorine residual in the distribution system.

In a secondary stage, concentrate passes through brackish water RO membranes, increasing the recovery rate even more. (Lauri reports a 95 percent recovery of water through the primary nanofiltration stage, and an additional 3 percent through the secondary RO system.)

Even though the new facility essentially runs on automatic, Mesa Water’s operations team received extensive membrane training from Carollo — its design engineer — and others prior to system startup. Separation Processes Inc. has been instrumental in providing membrane support services.

“Since startup, the MWRF has been running very well,” says Lauri. “We’re getting color units of less than one — essentially the detection limit of the instruments. And our customers have noticed; I’ve received numerous comments about how good the water quality is.”

Because the old plant was removed to allow construction of the new, the district had to import a portion of its drinking water for two years. “While imported water is a reliable backup supply, our local resources are more cost-effective,” says Lauri, re-emphasizing the importance to Mesa Water of having a completely self-sufficient drinking water supply.

The system is paying off, and Mesa Water sees direct benefits in the areas of valve and meter replacements.

“Before, we were replacing 20 to 25 valves a year,” Vilander says. “Now we’re doing 50 valves with less people, and we’ve improved the way we replace valves in the system. We were doing one here, one there. Now we’ve started targeting valves, grouping them, and replacing more in one area. We’re planning the work.”

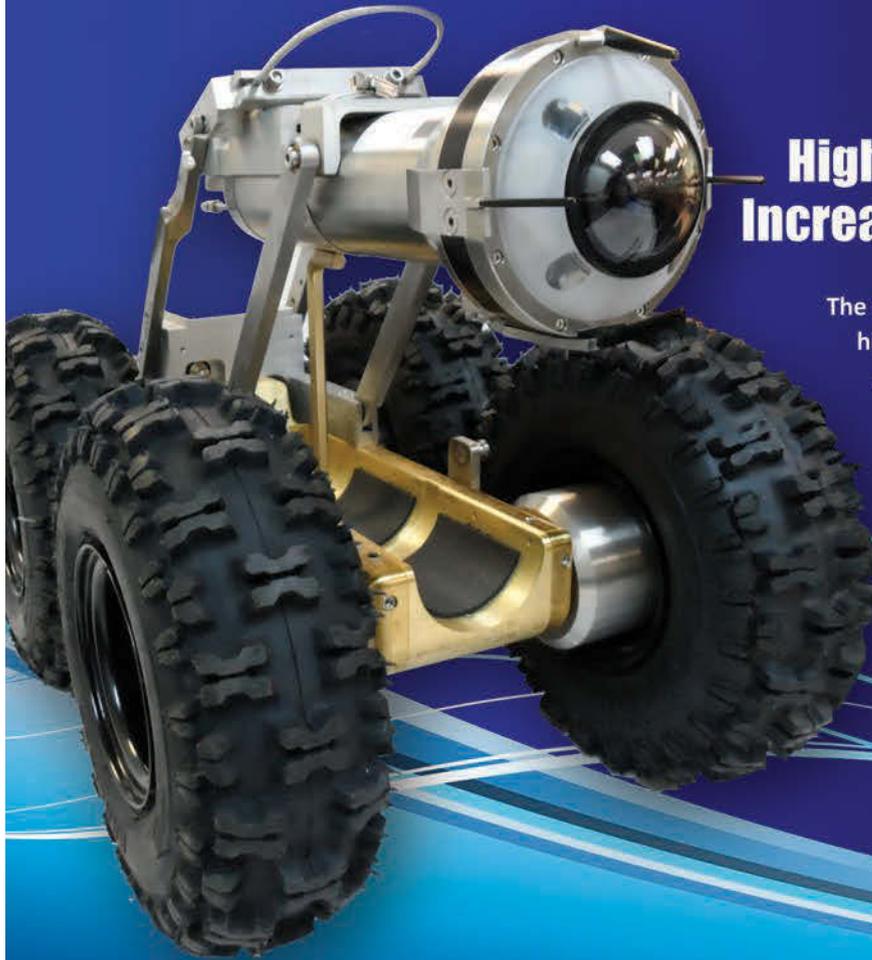
Likewise with meters. “We replace our meters regularly,” says Lind. “We’ve been on a 15-year replacement cycle, although we may change that. We don’t just react to a stuck meter; that’s not how we work.

“Typically, we replace about 1,300 meters per year. While some agencies have a meter testing program based on the age of the meter, we’ve run a statistical analysis that includes meter use, type of service and age.”

Lind says the surveys produced a predictive model that indicated replacing meters approximately every 15 years was about right. “Otherwise, we’d be spending more money (on labor and the sheer cost of the meters) than we’d be getting back in return,” he notes.

The numbers are also helping the district better target meters that are candidates for replacement. “We are recording different pressure zones in the system, and targeting meters

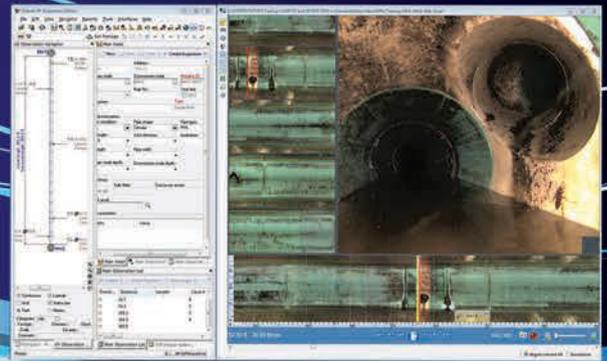
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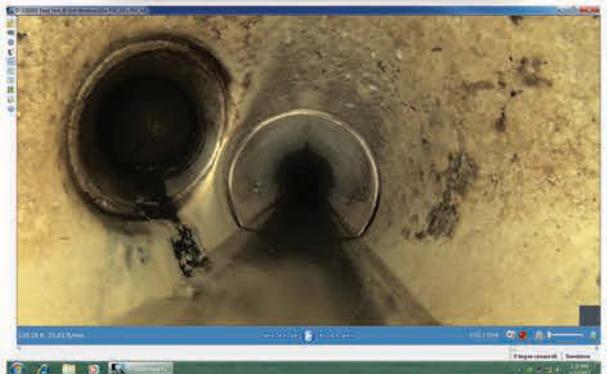


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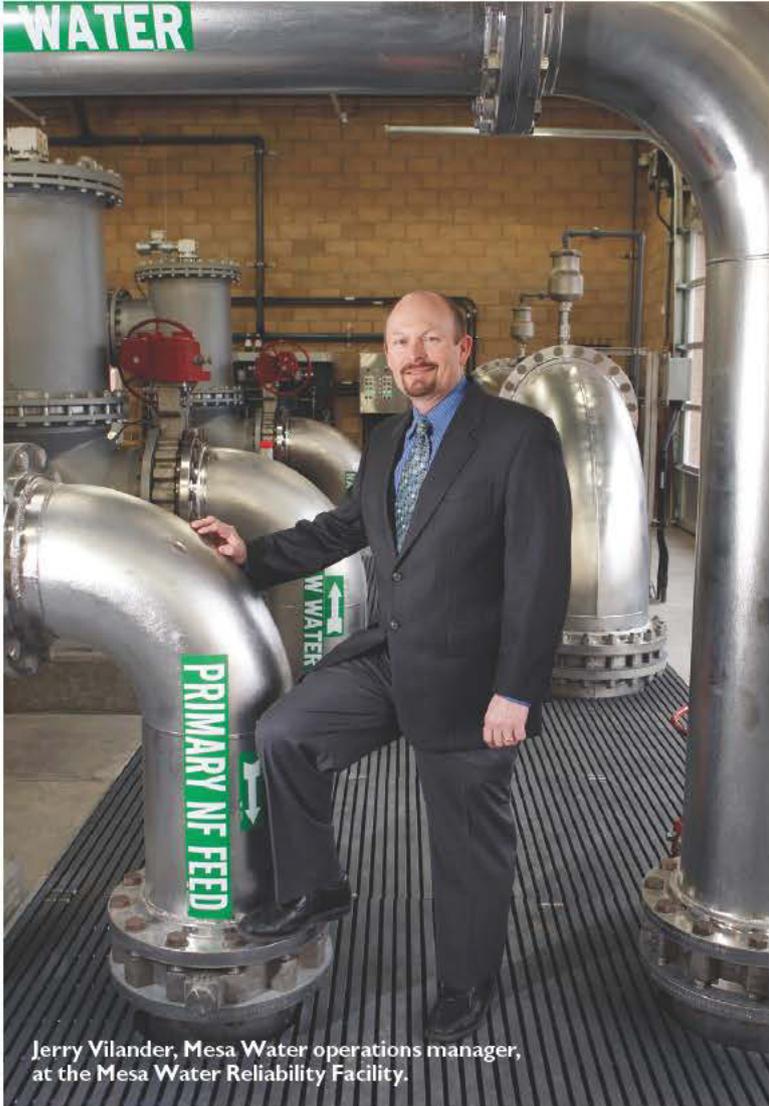
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Jerry Vilander, Mesa Water operations manager, at the Mesa Water Reliability Facility.

based on age, pressure and flow-through,” Lind says. “This way we can be more proactive in certain areas, and establish better time frames.”

Little water loss

Vilander and Lind point out that Mesa Water generally loses very little water through leaks, yet its crews are no less vigilant exercising and maintaining valves and hydrants on a regular basis.

“If we find a problem, we attack it immediately and fix it right away,” Vilander explains. If it turns out to be a long-term issue like a bad section of main, the district staff quickly notifies its water board and seeks the necessary funds to repair it. “We move swiftly to replace a main,” says Vilander. “A Band-Aid approach will not work.”

The clay soil in the area helps, as leaks do not migrate underground and are quickly visible on the surface.

Water use efficiency is another critical activity at Mesa Water.

Justin Finch is the district’s conservation specialist, and Barry Carl-

son is customer services manager. Together, they concentrate on water use throughout their service area, tracking water consumption, working with customers, and improving water efficiencies. “Our goal is to try to help everybody use water wisely,” Finch says.

The district employs a uniform rate structure to convey the strongest price signal at the very first billing unit. It’s also part of the Orange County Regional Alliance, which has a goal of reducing water usage across the region by 20 percent by 2020 — in compliance with the California Water Conservation Act of 2009.

The district measures its performance according to new American Water Works Association audit standards, which take into account the financial, operational and water resource practices of an agency.

In addition to the meter testing program, Mesa Water has adopted audit recommendations regarding well balancing, evaluating the true costs of imported water, and third-party verification of meter billing



Mesa Water workers head out on the job from headquarters. Crews focus on proactive maintenance to avoid costly emergency situations.

“Before, we were replacing 20 to 25 valves a year. Now we’re doing 50 valves with less people, and we’ve improved the way we replace valves in the system. We were doing one here, one there. Now we’ve started targeting valves, grouping them, and replacing more in one area. We’re planning the work.”

Jerry Vilander

accuracy. “According to the audit, we have rated ‘Excellent’ the last two years and are very close to ‘World Class,’ the top ranking,” says Carlson. “We are moving in the right direction.”

Helping customers

Mesa Water keeps in close contact with its water users through a variety of programs. The flagship program is what Finch calls the “Water Wise House Calls” program.

“When our customers receive a water bill they think is high, they can call us to get advice on reducing usage,” he says. At the same time, Finch targets the top 20 percent of residential customers and uses special mailings regarding water use efficiency.

“Most of our customers are on top of their indoor water use,” explains Finch. “Outdoors is where they can get most of their savings.”

“We want them to take control of their irrigation controller,” he adds. “Say ‘hello’ to it, find out where it is, how it turns on and off. We show them how to use the controller, how to adjust the sprinkler schedule based on the weather.”

Finch says the Mesa Water team also advises users on types of sprinkler heads to use to save water. They

recommend rotating sprinkler nozzles to reduce evaporation and ensure more water gets to the plants, and low-flow drip irrigation for shrubbery.

“We also hold water conservation forums,” he explains. The meetings are attended by public entities, cities and other municipal developments that have a lot of resources tied up in landscaping. Mesa Water also sponsors landscape workshops and maintains a wise water use garden at its home office.

“We try to put a face on the district for our customers,” Finch explains. “We want them to say, ‘Hey, these guys want my water bill to be lower and they’re going to show me how.’” ♦

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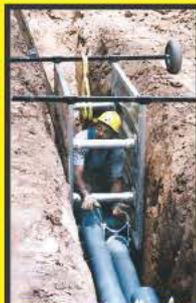


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COACH 'EM UP

To develop engaged employees, be more of a coach than a commander

By Ken Wysocky

So you feel like your employees aren't leaving it all on the workplace playing field every day? Not giving it 110 percent between the cubicles? Unwilling to do what it takes to win?

Wes Pruett has a suggestion: Try being a little less of a commander-in-chief and a little more of a coach.

"Many people don't understand the engagement process," says Pruett, the owner of HR Advisors (www.hradsvisors.biz) and a human resources and employee-coaching consultant. "They view their position as more of a master-and-commander kind of thing, where they give direction and make decisions.

"While that's certainly true, they sometimes miss the point of involving and engaging employees ... getting them involved in those decisions, too," he adds. "A lot of managers just don't see the connection between employee engagement and performance and how to get them engaged. That's where (employee) coaching comes in."

For many of us, the word "coaching" conjures up images of a fiery Vince Lombardi or Knute Rockne, firing up players with inspiring pre-game or halftime talks. While that may well work in the sporting world, the workplace arena requires something quite different, Pruett says.

"They're very different things," he explains. "Coaching in sports is often about training and education ... and about motivating players. But coaching in the workplace often isn't about that. It makes an assumption that an individual is capable and that your job is to help them kind of figure

out what they need to do and how they should do it.

"So you're helping them develop critical-thinking skills and problem-solving skills," he adds. "It's about developing independent thinking and autonomy."

Benefits abound

Allowing employees to make decisions on their own — with your support — can yield many benefits. For starters, just telling people what to do disempowers them and makes them feel devalued, while independence and autonomy makes them feel more valued.

Empowered employees also buy in to projects and assignments; it's easier for employees to commit

they'd want to be led: micro-managed or empowered? Or appeal to their sense of what's best for their company or organization. And it'll get easier after they begin to see results from their new coaching approach to management.

"One of your jobs as a manager is to develop your employees and find your replacement, and this is a purposeful way to do that," Pruett says. "Some people feel threatened by that concept. But for most people, they just lack the skill — no one ever taught them.

"When they get a chance to learn coaching skills, they do remarkably well," he continues. "All of sudden, they see that it works, that it actually can make their life better."

"Coaching in sports is often about training and education ... and about motivating players. But coaching in the workplace often isn't about that. It makes an assumption that an individual is capable and that your job is to help them kind of figure out what they need to do and how they should do it."

Wes Pruett

to something they've had a hand in deciding. In addition, it's also easier to hold them accountable for results. Moreover, studies show that employees value engagement and empowerment over money, in terms of how they impact job satisfaction.

How do you get command-and-control managers to buy into the concept of coaching? After all, most managers didn't develop their management styles overnight, and entrenched habits are hard to break. Pruett suggests appealing to their sensibilities by asking them how

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.

Basic skill requirements

Pruett says effective coaching requires six basic skills:

1. A good manager-employee relationship. If you don't trust each other, coaching will be ineffective.

2. Great listening ability. Good coaching is 80 percent listening and 20 percent talking.

3. Asking thought-provoking questions. Pose questions that make people reflect on or analyze their situation, so they can make effective decisions. For example, instead of asking an employee how they spent a day, ask him or her how they could have been more effective. This spurs some internal evaluation and engages thinking skills.

FIVE STEPS FOR CONDUCTING AN EFFECTIVE COACHING SESSION

1. Explain the current situation — what you're dealing with or where you're at.
2. Set a goal.
3. Bridge the gap — analyze what it'll take to get from Point A to Point B.
4. Take action, using SMART criteria (Specific, Measurable, Attainable, Relevant, Timely and Evaluate).
5. Review — ask the employee(s) to explain the plan to ensure mutual understanding and employee accountability, then monitor progress on an ongoing basis.

4. **Effective strategizing.** When you assign a project, don't tell employees what to do. Instead, talk about the best ways to complete it — discuss resources needed, deadlines, potential obstacles, etc.

"It's like a roadmap," Pruett points out. "Often there are one thousand ways to get to the same endpoint. But it's your job to help them figure out that best way for them and for the company."

5. **Provide feedback.** Challenge employees' assumptions and point out any inconsistencies in their approach to a project. Moreover, hold them accountable — pin them down to making a commitment.

6. **Offer encouragement.** This is particularly important for employees who resist change and may not feel comfortable in their new, more-engaged role.

"Just give them a pat on the back," Pruett suggests. "Sometimes it's as simple as giving them permission ... or helping them believe in themselves. Just don't encourage them to do something way beyond their skill level."

All six skills are entwined, Pruett notes; none of them stand alone. And learning these skills, as well as changing your management style from a drill sergeant to a coach, may take some time.

"But if you make an honest effort, starting with a sincere desire to do what's best for employees, these skills will take you a long way down the road toward maximizing the effectiveness of your employees," he concludes. ♦



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CUTTING OUT THE RISK

Utilities need to work together to eliminate cross bores and the associated dangers they present

By Ted DeBoda, P.E.

Last month we presented several photographs to be coded. I would like to dedicate this entire article to one code in particular, the OBI code.

The Pipeline Assessment and Certification Program and Lateral Assessment and Certification Program manuals define the OBI Code as an “Object Intruding Through the Pipe Wall — typically third-party objects that have been inserted after the pipeline/sewer’s construction.” This code is used in pipelines and laterals to describe a condition within a pipe where another utility such as a gas line has penetrated the pipe, causing a very serious and potentially dangerous phenomenon known as a cross bore.

The Cross Bore Safety Association defines cross bores as “an intersection of an existing underground utility or underground structure by a second utility, resulting in direct contact between the transactions of the utilities that compromises the integrity of either utility or underground structure.” Damage caused

by cross bores can be instantaneous, or can take weeks, months or years to manifest to the point where the damage is evident. Utilities such as electric, fiber optics or water mains that are accidentally installed through sewer laterals and mainlines can cause fractured or broken sewer pipe, or even collapse.

When gas mains are installed through these sewers, they may lie dormant for 20 or 30 years until a sewer cleaner or plumber cleans the line, at which time the sparks from the cleaning tools reach, for example, a pressurized gas source, causing an explosion. Over the years, such explosions have destroyed property, caused many injuries, and cost several lives.

Gas companies around the country are using CCTV to inspect pipeline and lateral segments for objects intruding through pipe walls. Many sewer providers are also inspecting their laterals as part of a comprehensive system evaluation to eliminate extraneous flow into the system.

Regardless of the system owner’s responsibility for maintenance of

the lateral once it leaves the mainline, or how the inspections are funded, the condition of the laterals in a system can provide valuable information about the operation of the collection system. The best of both worlds is when sewer and gas providers can work together to the

Damage caused by cross bores can be instantaneous, or can take weeks, months or years to manifest to the point where the damage is evident.

benefit of each. Many municipalities throughout the country have worked together with gas companies to provide each with the information they need at a reduced cost.

In Cincinnati, the Department of Public Works has developed such a relationship with Duke Energy. By working together and using the common language of LACP, the gas company can investigate all defects coded OBI for potential cross bores, while the city can determine the con-

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

dition of lateral pipes connected to their mainlines to make determinations related to I&I, potential operation and maintenance issues, or just to mark lines more accurately for future utility crossings.

“This arrangement has saved both utilities money,” says Jerry Weimer, supervisor of the Metropolitan Sewer District of Greater Cincinnati. “By sharing the cost and management, the program has found multiple cross bores, both gas and other utilities, preventing possible catastrophes.”

It is important that sewer providers work with gas companies to help eliminate cross bores while providing a higher level of service to their customers at a reduced cost. You can find more information about cross bores at www.crossboresafety.org.

By working together, we will all win while promoting NASSCO’s 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.

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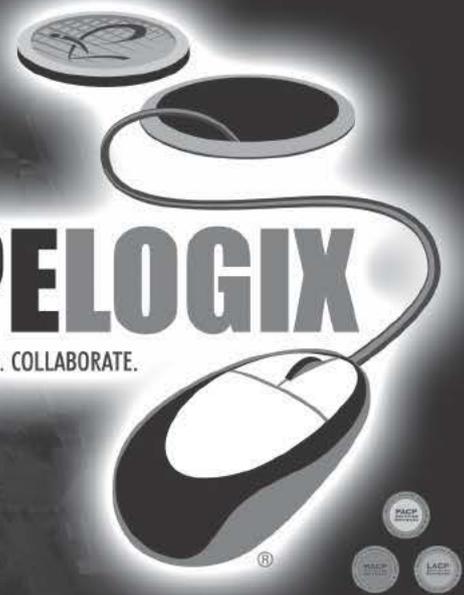
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By Craig Mandli

Sewer Bypass/Dewatering Pump

The **Yakka150i** from **AllightPrimax** is designed with replaceable wearplates and impellers in stainless steel materials, as well as the capability to pass 3-inch solids, making it suitable for a range of applications, including sewer bypass, permanent backup and dewatering. It operates quietly, emitting only 65 dBA at 23 feet. The body is impact-resistant and requires little or no maintenance due to its poly outer shell. The strong tubular frame design provides side and end protection, and lockable gull wing doors wrap over the body for added security and easy access. All controls are situated inside the lockable module. **877/477-4629; www.allightprimax.com.**



Open-Channel Flow Monitor

The **FlowSiren** from **Blue-Siren** is a wireless, low-power, multi-sensor open-channel flow monitor with vision sensor that allows technicians to measure and view any flow conditions using contact and/or non-contact sensors. Advanced power management keeps it collecting and transmitting data for over a year using only four D-size lithium batteries. Designed using IP68 connectors, the FlowSiren is fully submersible and waterproof. Completely encapsulated and manufactured using impact-proof plastics, the FlowSiren can handle harsh environments. Data is automatically uploaded to a server of choice, or using the Blue Live hosting platform powered by Earth Monitoring Data-Base. **321/242-0300; www.blue-siren.com.**



UV Disinfection System

The **InLine+** series of UV disinfection systems from **Aquionics** use medium-pressure lamps, allowing for a small footprint and minimal maintenance requirements. The system is ideal for tight-fitting spaces without the need for expensive building construction or large modifications to existing structures. It covers a wide range of flows and water qualities, from the smaller facilities needing disinfection on a few gpm, to the larger facilities with several hundred mgd of flow. It comes standard with highly efficient medium-pressure lamps, DVGW sensors, automatic wiping system (chemical option available) and variable power ballasts, which ensure only the power required for disinfection is consumed. **859/341-0710; www.aquionics.com.**



Pump and Flow Management

Symphony - Harmonious Pump & Flow Management from **Data Flow Systems** utilizes SCADA to coordinate the system-wide operation of sewer lift stations to reduce force main pressures and equalize flow into a wastewater treatment plant or master. The result is a significant reduction in energy costs and a solution to daily peak flow and pressure spikes. It addresses the random operation of each lift station operating on a common force main, and synchronizes the pumping activity on a minute-by-minute basis. Head pressures are reduced and pumps begin to operate more effectively and efficiently. It also tackles peak flow issues and levels the flow into a wastewater treatment plant by systematically managing the force main's diurnal curve over a 24-hour period. **321/259-5009; www.dataflowsys.com.**

Plug-and-Play Ultrasonic Flowmeter

The **FL900 Series** flowmeter from **Hach Flow Meter Products & Services** offers level-only alarming and redundant-level functionality. In addition to the ultrasonic level sensor technology, radar, electromagnetic and acoustic Doppler velocity technologies are also available. The plug-and-play design allows for up to four sensor connections with auto-detection of sensor type, allowing users maximum flexibility for their flowmeter inventories. It is available with the company's Data Delivery Services Program, which uses wireless loggers and sensors and provides real-time unedited flow data through FSDATA Web-based software. **800/368-2723; www.hachflow.com.**



Flowmeter with Tracked Mount

The **Sonic-Pro** hybrid ultrasonic flowmeter from **Blue-White Industries** is available with a T-Track Mounting system. The new small pipe capability is down to 0.5 inches, while the new large pipe capacity is up to 100 inches. Installation is fast and simple. The system features NEMA 4X quick disconnects. The flowmeter uses either Doppler or Transit Time methods, and works with both clean and dirty fluids. Features include custom metric algorithms and DSP technology, easy-reading display with backlit LCD, data logged to standard SD card format supplied with unit, fully configurable isolated 4-20 mA output and 0-1000 Hz Pulse Output, and a computer connection for functional control. **714/893-8529; www.blue-white.com.**



Wastewater Evaporator

The **DriBoss DBE-750 Evaporator** from **Dust Control Technology** is driven by a powerful 25 hp industrial-grade motor. The high-speed head features stainless steel fan blades for optimal droplet distribution, yet the low plume height helps ensure short drift distances. The design helps eliminate wastewater quickly and cost-efficiently, even without large evaporation ponds. Its 7.5 hp submersible pump is attached to a frame that floats on polyethylene pontoons, which are filled with closed-cell urethane foam, so even if a pontoon is accidentally punctured, it retains its buoyancy. 309/693-8600; www.driboss.com.



Optical Absorption Sensor

The **OUSAFII** sensor from **Endress+Hauser** is designed to measure optical absorbance by a process fluid. Using visible and near-infrared wavelengths of light, it is ideal for product loss detection, interface detection, and suspended solids and turbidity measurements. The sensor emits light in both the visible and near-infrared regions, and absorption by the process fluid is determined using an optical sensor mounted in the sensor head. The sensor is available in an immersion model for use in open tanks and basins, or in an insertion model with Tri-Clamp or Varivent connections that meet 3A sanitary standards. 888/363-7377; www.us.endress.com.



Thermal Mass Flowmeter

The **QuadraTherm 640i/780i** thermal mass flowmeter series from **Sierra Instruments** achieves gas mass flow rate measurement accuracy of ± 0.5 percent of reading above 50 percent of the full scale (Air). Its QuadraTherm system introduces four sensors — three precision platinum temperature sensors and one patented no-drift DrySense mass velocity sensor, which uses a manufacturing process to greatly improve accuracy and long-term stability. Features include a no-drift sensor with lifetime warranty and multivariable output: mass flow, temperature, pressure (optional). It measures all inert and all non-condensing clean and flammable gases. 800/866-0200; www.sierrainstruments.com.



Portable Ultrasonic Flowmeter

The **Regal Series RH40** ultrasonic flowmeter from **Spire Metering Technology** is engineered to deliver fast, non-intrusive flow and BTU measurement across a broad array of pipe sizes and applications. It is completely portable and relies on clamp-on sensors to perform non-intrusive measurements on flow, temperature and heat energy/BTU consumption on pipes ranging from 0.5 to 120 inches in diameter. It weighs 1 pound, but provides large data logging storage, analog input/output options and on-site diagnostic features, as well as seamless connectivity to a smartphone or PC for fast data downloading and analysis. 888/738-0188; www.spiremt.com.



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Level-Sensing Probe

The **DuoProbe** from **Multitrode** combines a 10-sensor level-sensing probe with a high-resolution submersible pressure transducer. Its primary and backup level sensors cut the risk of spills and minimize the need for site visits. It requires virtually no maintenance, replaces troublesome floats and bubblers, and eliminates the need for a vent or breather tube. It can measure the water level in the entire well, and can be installed without entering the pit. Its high-resolution level reading is useful where monitoring small changes in level is desirable, providing greater energy savings. It offers the ability to monitor the liquid level after it has exceeded the top of the probe, which is significant in emergency conditions. **561/994-8090; www.multitrode.com.**



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Fluorimeter

The **HF scientific HF-38 Fluorimeter** from **Watts Water Technologies** is an extremely sensitive, hand-held, ruggedized instrument designed for field-testing of toxic heavy metal contaminants in water supplies. It requires no special skill or knowledge of chemistry to operate, and is designed for use with HF heavy metal sensors. Through the use of DNA sensors, a reaction that fluoresces in the presence of a target contaminate substance, such as lead, is measured to determine the concentration of the target heavy metal and is reported in parts per billion. **978/688-1811; www.watts.com.**



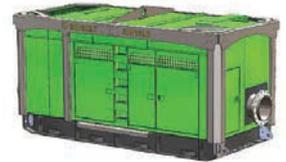
Electromagnetic Flowmeter

The **M2000** electromagnetic flowmeter from **Badger Meter** achieves an accuracy of ± 0.25 percent. Built without moving parts to impede the flow stream, the open tube design virtually eliminates pressure loss. Communications protocols include HART, Modbus RTU and PROFIBUS DP. Kits include data logging, store/restore and firmware upgrade. It allows users to record totalizer and error, startup and configuration events to a memory token, and gives users the flexibility to easily switch between meter configurations. **800/876-3837; www.badgermeter.com.**



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The **Ru-33 Recording Telemetry Unit (RTU)** from **Telog Instruments** provides real-time monitoring and alarming of instruments and sensors. With a submersible enclosure, it can be installed in sewers or other underground applications. An optional burial antenna can be embedded in the street pavement, producing a complete underground wireless monitoring system. It directly monitors open-channel wastewater flowmeters, as well as pressure level sensors, ultrasonic level sensors, water quality sensors and Sondes. It then forwards the data wirelessly. It is powered by a single 6-volt alkaline lantern battery with up to two years of life. **585/742-3000; www.telog.com.**



Gas Detection Wall-Mount Controller

The **TA-2016MB-WM** gas detection wall-mount controller from **Mil-Ram Technology** features a 16-channel system (8-channel available) utilizing the RS-485 Modbus RTU Multi-drop Network. It features four relays, LED alarm indicators, a local buzzer, and backlit LCD auto-scrolls for channel data/fault conditions. The Auto-Configuration Wizard makes channel configuration simple and automatic. Several network modules are available to achieve desired functionality in a cost-effective manner. Options include remote relay modules, including a remote digital output module that provides RS-485 Modbus RTU interface to a centralized system. 510/656-2001; www.mil-ram.com.



Gravity Filter

The **WWETCO FlexFilter** from **WestTech Engineering** uses a synthetic compressible media to capture solids in a high-rate filtration process. Rising influent applies hydrostatic force to the outside of tapered flexible bladders, causing the media within the bladders to compress loosely at the top of the filter. This tapered compression provides for a filtration bed that is more open at the top of the filter, graduating to more densely packed synthetic media in the deeper portions of the filtration bed. As the liquid flows over the top of the bladders, larger particles are trapped in the upper portions of the filter. As the liquid works its way down, smaller particles are captured. The backwash system involves an air scour coupled with a high-energy wash cycle and specialized backwash troughs to minimize the volume of backwash needed. 801/265-1000; www.westech-inc.com.



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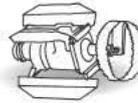
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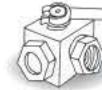
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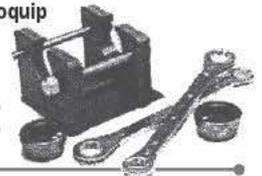


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Warren Rupp names general manager

Warren Rupp promoted Scott T. Aiello to general manager. He will join the newly formed diaphragm and dousing pump technology team. Former general manager John Carter was promoted to president of the DDPT group.



Scott T. Aiello

Rhino Linings celebrates quarter century

Rhino Linings Corp., manufacturer and distributor of industrial protective coatings, specialty epoxies and spray foams, celebrates 25 years of equipment protection in 2013.

Separmatic Systems adds regional sales manager

Separmatic Systems named Carl McCrary regional sales manager for the northwest United States. He will be responsible for sales and public support for municipal water utilities and public utilities.

McElroy releases catalog, reference guide

McElroy issued its polyethylene pipe fusion catalog and reference guide. The catalog features product introductions, information on calculating fusion gauge pressure, facer blade replacement charts and pipe size reference charts. Copies are available for download at www.mcelroy.com/catalog.



Stormwater Maintenance and Consulting president honored

Jennifer Rauhofer, P.E., president of Stormwater Maintenance and Consulting, received the Penn State Outstanding Engineering Alumni Award. The award is the highest honor bestowed by the College of Engineering.

RapidView names marketing, communication manager

RapidView named Scott Sayger marketing and communication manager. He has 10 years experience in marketing and public relations, radio and television production and Web design.



Scott Sayger

Bingham & Taylor names sales managers

Bingham & Taylor named Mark deLancellotti sales manager for the western United States and Brad Washburn sales manager for the Northeast. DeLancellotti will be responsible for water and gas customers in California, Washington, Oregon, Arizona, New Mexico, Montana, Idaho, Wyoming, Colorado, Nevada, North Dakota and South Dakota. Washburn will be responsible for water industry customers throughout New England.

Vortab offers flow conditioning brochure

The Vortab Co. offers a brochure for plant, process and instrumentation engineers on flow conditioning devices that improve the performance, accuracy and repeatability of flowmeters and other flow profile critical process equipment. The brochure is available for download at www.vortab.com.



Xylem's Dallas facility receives ISO certification

Xylem's Dallas facility received ISO 9001:2008 certification. The plant designs and manufactures packaged pumping systems, controls and RO treatment systems for municipal, residential, commercial and industrial applications. The ISO audit was performed by Det Norske Veritas.

Hanson Pressure Pipe achieves safety milestone

Hanson Pressure Pipe's Grand Prairie, Texas, plant surpassed one million hours without a lost-time injury. Hanson employs 400 workers at its 400-acre Texas site.

American Water names CFO

American Water Works Co. named Susan N. Story chief financial officer. She succeeds Ellen Wolf who retired in January. Story has 30 years of utility experience.



Susan N. Story

KROHNE offers Web-based training

KROHNE offers Web-based training on measurement technologies through its KROHNE Academy. The audio-enhanced, interactive courses focus on either a measurement technology, such as variable area, vortex, ultrasonic or mass flow; or general topics, such as the basics of gas measurement or pipeline leak detection. Training is free and is not specific to individual products and/or industries. ♦

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By *Scottie Dayton*

Technology captures non-revenue water

Problem

Providence (R.I.) Water, the largest utility in the state, was losing 11 percent, or 2.57 billion gallons of water, in its distribution system, amounting to an annualized net cost of \$954,315.



Solution

The utility bought leak detection equipment from **Itron**.

RESULT

Since June 2012, the utility has repaired 49 leaks, recovering more than 27 million gallons annually. The equipment enabled the utility to notify customers of side leaks and enhance user engagement to mitigate the effects of droughts and heavy demand. 866/374-8766; www.itron.com.

Filter fabric and liner trap sediment

Problem

The stormwater management program in Brookfield, Conn., required engineers to trap sediment that could flow into collection chambers at the Riverview apartment complex.



Solution

CULTEC representatives recommended wrapping filter fabric around the first row of chambers to capture the first flush, and placing a polyethylene liner beneath the chambers to prevent suspended solids from intruding into the stone beds.

RESULT

Engineers installed a sump pit beneath the first chamber to capture silts and fines. A jet pushed water toward the catch basin and sump for cleaning. 800/428-5832; www.cultec.com. ♦

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Product Spotlight

Self-propelled fusion machine joins 6- through 20-inch pipe

By Ed Wodalski



TracStar 500 Series 3 fusion machine from McElroy

The self-contained, self-propelled TracStar 500 Series 3 fusion machine from McElroy has an indexer-mounted heater and facer, economy engine throttle offering 11 hours of operational fuel capacity, and hydraulic clamping, eliminating the need to manually clamp and unclamp machine jaws from pipe.

The machine is available in standard and automatic models. The automatic version controls and monitors the heat, soak, fuse and cool cycles. The system guides the operator through the step-by-step procedure. Both standard and automatic models can record fusion parameters using McElroy's DataLogger.

Powered by a three-cylinder Kubota diesel engine, the machine is designed to butt-fuse 6-inch IPS to 20-inch OD pipes. Dual-speed, hydraulically driven tracks enable the machine to be unloaded and set up on job sites, and allow for minor adjustments underneath the pipe. Other features include dual hydraulic pipe lifts and a removable carriage.

The attached heater eliminates the need for manual insertion and removal as well as manually pivoting the facer into the fusion carriage. The indexer-mounted heater and facer are powered by hydraulic cylinders that work at the touch of a button.

Equipped with three throttle settings — high, low and economy — the machine throttle can drop to low when the heater cycles off. High-flow hydraulics are not required, saving fuel during the pipe joint cooling cycle.

Once positioned on the job site, the onboard hydraulic pipe lifts work in conjunction with pipe stands or the McElroy PolyHorse to feed and align pipe into the carriage jaws, says Brandon Jackman, project engineer with McElroy. "The jaws are clamped around the pipe, which is

then faced off by the hydraulic rotating facer that contains three blades per side. Once the pipe is faced, the heater is rotated into place and the pipe ends are brought into contact."

Heat is allowed to soak into the pipe ends using prescribed pressure and time cycles. Once the heat soak is complete, pipe ends are brought together under pressure and held until cool. Pipe is then pulled through the machine for the next joint or the machine can be driven to the end of the fused pipe.

The removable carriage enables the fusion machine to be used in tight confines and configured in several different ways to meet user needs, Jackman says. "The four-jaw carriage can be separated and used with the heater and facer mounted to the hydraulic indexer. The outer fixed jaw can be removed from the four-jaw configuration to allow fusion to pipe fittings that interfere when clamped in the inner jaw."

The heater and facer also can be removed from the hydraulic indexer and lifted in using on-site heavy equipment. Power for the heater is supplied by an onboard generator.

In addition to routine engine care (oil, filter, cooling system), maintenance items include hydraulic oil and filter changes and grease points on the indexer slide, pivot bearings and rubber-tracker undercarriage, which should be cleaned after use in mud to prolong component life. McElroy also offers training for proper troubleshooting. 918/836-8611; www.mcelroy.com/fusion.



Industrial Scientific Tango gas monitor

The Tango TX1 single gas monitor from Industrial Scientific detects carbon monoxide, hydrogen sulfide, sulfur dioxide and nitrogen dioxide. Features include DualSense technology for increased worker safety regardless of bump test frequency. The monitor is powered by one replaceable 2/3 AA lithium battery for up to three years of continuous operation. 800/338-3287; www.indsci.com.

HammerHead 34-inch pneumatic hammer

The 34-inch pneumatic pipe-ramming hammer from HammerHead Trenchless Equipment can install casing 48 inches to 180 inches in diameter in drainage culvert and washover applications. It also can be used for pipe assist or pipe extraction, guided pilot bore ramming and horizontal directional drilling. 800/331-6653; www.hammerheadtrenchless.com.



Oldham fixed gas monitor

The iTrans fixed gas monitor from Oldham, an Industrial Scientific company, is compatible with WX and MX43 Series controllers. Features include an intelligent electronics platform providing one or two points of detection from a single head. Other features include

non-intrusive calibration, LED displays, programmable alarms and onboard sensor life indicators. 800/338-3287; www.oldhamgas.com.

InduSoft SCADA visualization app

The SCADA visualization app for Windows 8 and Windows RT from InduSoft provides mobile access to SCADA information from a variety of mobile access stations, including iPhones, tablets and laptops. 877/463-8763; www.indusoft.com.



Markland automatic duckbill sampling system

The automatic duckbill sampling system from Markland Specialty Engineering uses compressed air to move samples more than 79 feet vertically and 98 feet horizontally. Inherently explosion-proof (no pump or vacuum system), the rubber duckbill closes down and expels any large particles in a self-cleaning action. Lines are blown clear and dry after each sample is taken, enabling the system to operate in freezing temperatures. 905/873-7791; www.sludgecontrols.com.



Aries pipe maintenance, inspection tool

The Wolverine Cutting System pipeline maintenance and inspection tool from Aries Industries is designed to cut liner while delivering video imagery. Made for lateral reinstatement use in 6- to 16-inch pipelines, the self-propelled, wheeled cutting system travels up to 450 feet. It precisely mills or grinds liners with cutting forces from 1.6 hp to 3.35 hp. Cutter and camera functions perform simultaneously and are remote-controlled through a transmitting cable that delivers data to an above-ground workstation. 800/234-7205; www.ariesindustries.com.



Hayward Flow Control basket strainers

The Platinum GF-PP (glass-filled polypropylene) SB Series of basket strainers from Hayward Flow Control are available in sizes from 1/2 to 4 inches with true union threaded or flanged end connections. The vessels have a non-shock maximum pressure rating of 150 psi at 70 degrees F with a maximum service temperature of 240 degrees F. 888/429-4635; www.haywardflowcontrol.com.



Grundfos high-efficiency circulator pump

The MAGNA3 high-efficiency circulator pump from Grundfos Pumps, designed for commercial hydronic applications, cuts power consumption by 85 percent through its AutoAdapt function that automatically and continuously adjusts circular performance, and FlowAdapt control mode that reduces the need for pump throttling valves. Other features include a carbon fiber reinforced composite rotor that seals fluid from the stator motor, differential pressure sensor, constant-temperature mode, on-pump TFT display and rotating power head. The pump handles temperatures to 15 degrees F, has a maximum head of approximately 60 feet and maximum flow of approximately 570 gpm. 800/921-7867; <http://us.grundfos.com>. *(continued)*



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The 2600 drainage pump series from Flygt, a Xylem brand, is available in four models, ranging from 4 to 18 kW. Designed for water removal in harsh dewatering conditions, the pumps feature Xylem's DuraSpin hydraulic system, Hard-Iron impeller and plug-in cartridge seal. 704/409-9700; www.flygtus.com.

CAIG barrier hand lotion

Hand-E-Glove barrier hand lotion from CAIG Laboratories is applied before beginning tasks for soap-and-water cleanup and keeps skin from drying and cracking when applied under work gloves. 858/486-8388; www.caig.com.



Metabo carbide-tipped drill bit



The Ultra-X carbide-tipped SDS-Plus drill bit from Metabo Corp. is designed for use in concrete, masonry and stone applications. The bit has a 4- by 90-degree solid carbide head that reduces vibration for precise drilling. The flute design prevents lockup when rebar is encountered and removes dust through its short, wide channels. Bit diameters range from 3/16 to 9/16 inches with drilling depths from 2 to 16 inches. 800/638-2264; www.metabousa.com.

Water Cannon hot-water diesel pressure washer

Diesel-powered hot-water pressure washers from Water Cannon are customizable with psi ratings from 3,200 to 4,000 and deliver from 4 to 8 gpm. The V-belt-driven units are powered by Kohler diesel engines and have 15-gallon poly diesel fuel tanks, a 12-volt battery encased in marine-duty battery box, and a 45 amp charging system. 321/800-5744; www.watercannon.com.



TorcUP industrial torque wrench

The Slimline Ratchet Link industrial torque wrench by Torcup has a torque range of 395 ft-lbs to 3,950 ft-lbs for use on fasteners from 1 to 3 1/8 inches. The wrench fits in areas less than 1 inch wide. Powered by an electrically or pneumatically driven hydraulic pump, torque can be applied by one operator. 610/250-5800; www.torcup.com.

Berntsen RFID underground marking system

The InfraMarker RFID system for marking underground assets from Berntsen International uses a combination magnetic location and on-site data storage. The system uses GPS to get close to the asset, magnetic locators to pinpoint the location, and RFID signal to positively identify the asset. Data sets can be stored on the asset for identification and maintenance. 877/686-8550; www.inframarker.com.



Plastics Pipe Institute design software

Online plastic pipe pressure design software for water distribution, transmission main systems and force mains from the Plastics Pipe Institute enables industry professionals to perform calculations in accordance with AWWA and ASTM standards. The free Web-based program assists in the selection of an appropriate pipe class for the required design life. Standards used in PPI PACE include AWWA C900, C901, C905, C906, ASTM F714 and D2241. Principal authors for the project were Dr. Karl Lawrence and Dr. Mark Knight. www.plasticpipe.org.

Condux microfiber blower

The Gulfstream 200 microfiber optic cable blower from Condux International is designed for FTTH and Enterprise microfiber installations. The portable unit offers single-hand operation for the installation of microfiber from 0.8 mm to 5.5 mm in diameter in microduct from 3 mm to 12.7 mm. The blower can be powered by a small compressor at maximum pressure of 175 psi. 800/533-2077; www.condux.com.



Trelleborg vapor-suppressing spheres

Vapor-suppressing spheres from Trelleborg, designed for the storage tank industry, are applied dry and self-assemble into a foam-like substance that is lighter than oil and water. The resulting foam suppresses vapors to the point of extinguishing liquid hydrocarbon fires. The foam won't freeze or experience bubble degradation. 800/626-2180; www.trelleborg.com/npc.



RIDGID ABS, foam-core PVC pipe cutters

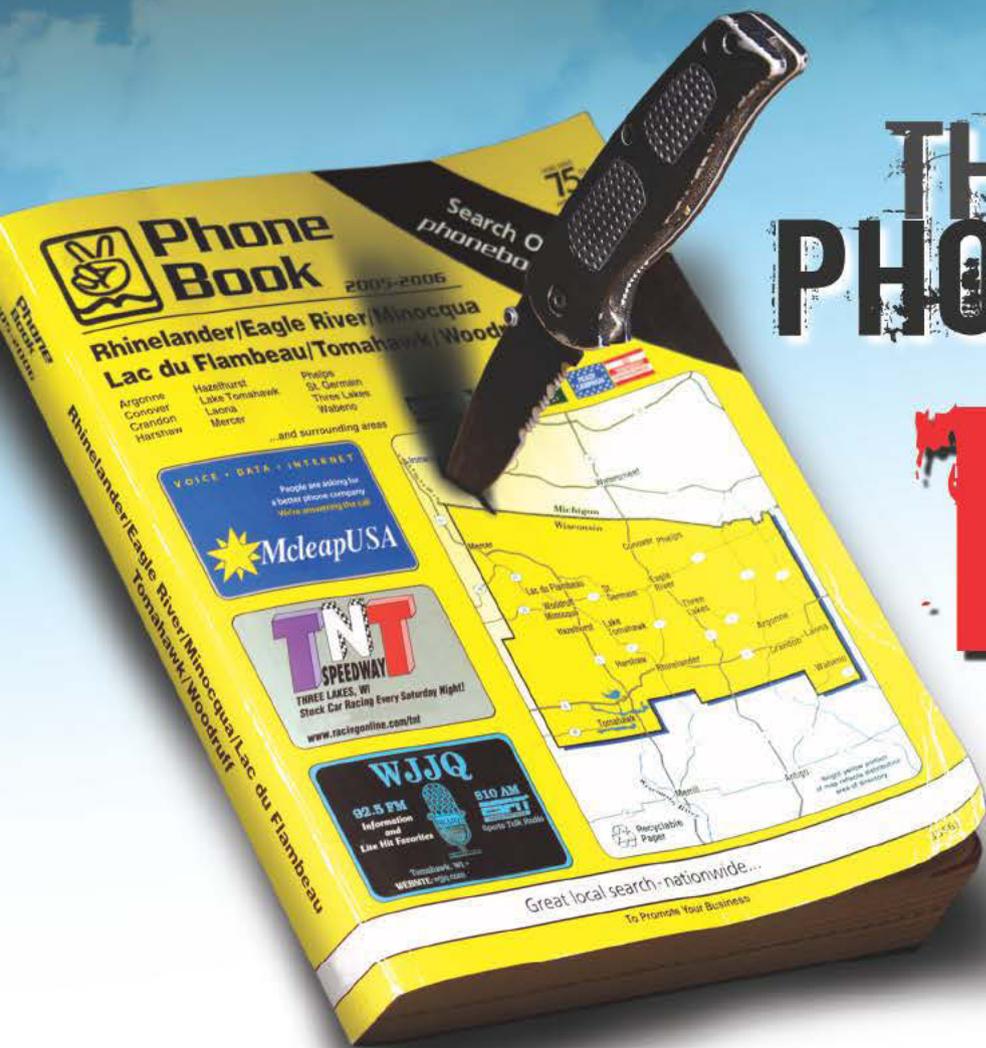
FC-Cutters from RIDGID are designed to cut ABS and foam-core PVC pipe. Available in two options for cutting 1 1/2- and 2-inch diameter pipe, the cutters feature an extended handle for leverage and one-rotation cuts that won't leave burrs. 800/769-7743; www.ridgid.com. ♦

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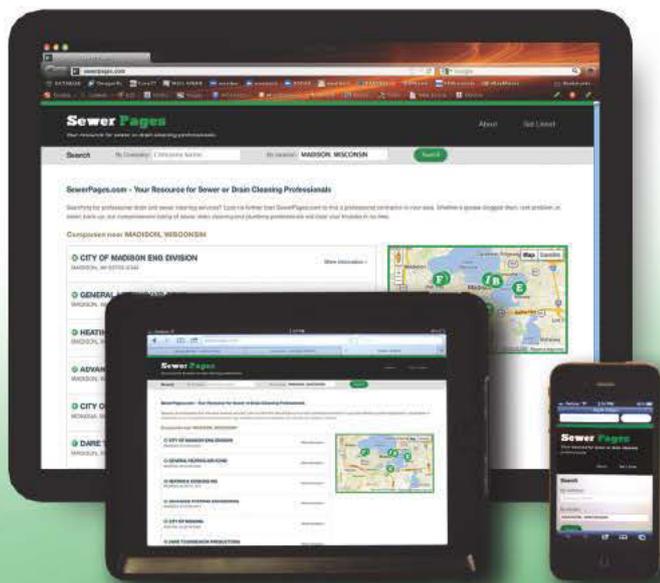
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PEOPLE/AWARDS

The **City of Martinsville (Ind.)** received a \$27,000 planning grant, awarded by Lt. Gov. Sue Ellspermann, to fund a stormwater planning study through the state's Office of Community and Rural Affairs.

The **City of Rome (N.Y.)** received an Environmental Excellence Award from the New York State Department of Environmental Conservation for its Canopy Restoration Project, an innovative approach to stormwater management. The project uses urban forestry to reuse vacant building space, increase property value, reduce runoff, and reinvest in the city's urban core.

The **Water Replenishment District of Southern California** received an Operating Budget Excellence Award for Fiscal Year 2012-2013 from the California Society of Municipal Finance Officers.

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

LEARNING OPPORTUNITIES

American Society of Civil Engineers

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- June 6-7 – Financial Management for the Professional Engineer, Dallas



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August 29-30, 2013 - Casa Grande, Arizona
Univ. Of AZ, Contact: Janine Lane at (928) 782-5882 or janinel@caals.arizona.edu

November 14-15, 2013 - Lakewood, CO
Colorado Professionals in Onsite Wastewater
Kate Carney at (720) 626-8989 or cpow@cpow.net

November 15, 2013 - Arlington, TX
RETS - Real Estate Training Systems
Contact: RETS at 817-861-9998 or rets@rets-llc.com

Operation and Maintenance Training Certification:

October 2-3, 2013 - Napa, CA
COWA - Evelyn Rosefield at (530) 513-6658 or evelyn@cowa.org

December 4-5, 2013 - Napa, CA
COWA & NAWT - Evelyn Rosefield at (530) 513-6658 or evelyn@cowa.org

Installer Workshops:

October 3-4, 2013 - Lakewood, CO
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Other CEU's for Recertification:

October 17, 2013 - Sonora, CA
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-- Watch the NAWT website and industry publications for updates --

For more information call: **800-236-6298** **WWW.NAWT.ORG**

CALENDAR

June 9-12

Water Environment Federation Collection Systems 2013: Gold Nuggets of Knowledge, Sacramento Convention Center, Sacramento, Calif. Call 703/684-2441 or visit www.wef.org

June 9-13

American Water Works Association Annual Conference and Exposition (ACE 13), Denver. Visit www.awwa.org.

June 11-13

University Council on Water Resources Conference, Lake Tahoe, Calif. Call 618/536-7571 or visit <http://ucowr.org>.

June 12

American Public Works Association-Washington State Chapter Northwest FOG Forum, Greater Tacoma Convention & Trade Center, Tacoma, Wash. Visit www.apwa-wa.org/chapter.

July 21-24

American Society of Agricultural and Biological Engineers, Kansas City, Mo. Visit www.asabe.org.

Aug. 18-22

StormCon: North American Surface Water Quality Conference and Exposition, Myrtle Beach Convention Center, Myrtle Beach, S.C. Visit www.stormcon.com.

Aug. 25-28

American Public Works Association International Public Works Congress & Exposition, McCormick Place, Chicago. Call 816/595-5241 or visit www.apwa.net.

- June 20 – Integrating Stormwater Harvesting into Low-Impact Development, online
- July 11-12 – Pumping Systems Design for Civil Engineers, San Diego
- July 11 – Preparing and Implementing Construction Site Stormwater Pollution Prevention Plans, online
- July 16 – Sustainable Stormwater Hydrology: Concepts to Reduce Hydrologic Footprint, online
- July 25-26 – Storm-Sewer System Design Using SWMM, Baltimore Visit www.asce.org.

American Water Works Association

The AWWA has a Dam Safety 2013 seminar Sept. 8-12 in Providence, R.I. Visit www.awwa.org.

Water Environment Federation

The WEF has a Collection Systems: Optimize System Operations web-cast on June 19. Visit www.wef.org.

Wisconsin

The University of Wisconsin Department of Engineering-Professional Development has a Using WinSLAMM v. 10: Meeting Urban Stormwater Goals P010 seminar on Oct. 14-15 in Madison. Visit <http://epdweb.engr.wisc.edu>. ♦

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

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