IRONSTRONG INSIGHTS™

A QUARTERLY MAGAZINE FROM MCWANE DUCTILE

SPRING 2020

McWANE DUCTILE™

BUILDING IRON STRONG UTILITIES FOR GENERATIONS

Buried No Longer

PG 4

Confronting America's Water Infrastructure Challenge

ALSO THIS ISSUE

McWANE DUCTILE

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IRON STRONG INSIGHTS

McWane Ductile has been an industry leader in the manufacture of water distribution and infrastructure products since 1921. With three U.S. foundries, McWane Ductile offers superior service while supplying Ductile iron pipe across North America and beyond, all while maintaining an unwavering commitment to safety and quality. Through continued innovation, it is our goal to meet the customer needs and industry demands of the future in order to Build Iron Strong Utilities for Generations.

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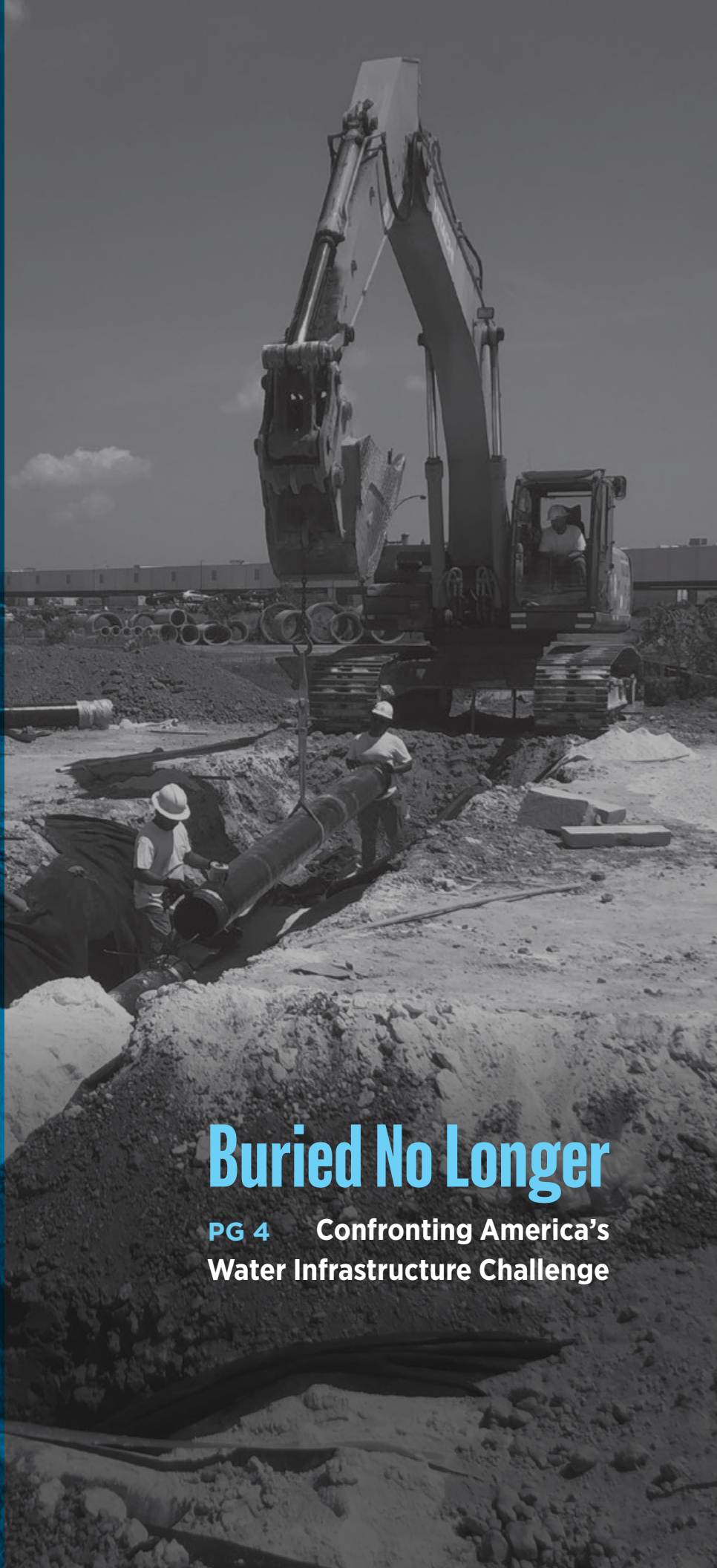


Buried No Longer

PG 4 **Confronting America's Water Infrastructure Challenge**

Welcome to Iron Strong Insights™

Dear Readers,

Welcome to the Spring edition of what was formerly known as Modern McWane. We chose the spring season as the best time to refresh our publication with a new look, some new features and, more importantly, a new name — IRON STRONG INSIGHTS. We think this new name more accurately reflects our intent with this publication, which is to inform, educate and entertain our readers. We hope you like the new look.

Although it may appear different, many of the same content is still in place. In this issue, we have two feature articles. The first, by Roy Mundy, P.E., revisits the 2012 AWWA report "Buried No Longer" and provides additional insight on the strategic findings of that research. The second article, by John Simpson, P.E., deals with protecting Ductile iron pipelines from stray currents and the steps that should be taken to ensure that the proper methodology is employed. As always, we have some new Ditch Doctor content where our professionals take real-life questions and turn them into a humorous yet informative read. Additionally, we have spotlighted various Ductile iron construction projects in our Project Profiles section. New in this issue is a feature we are calling the Pipeline Puzzle, a crossword puzzle using common industry terms and phrases as the answers.

Normally at this time of year, we are preparing for and promoting our attendance at the annual AWWA ACE conference. Unfortunately, due to the ongoing novel coronavirus crisis concerns, this year's show, which was to be held in Orlando, Florida, was canceled. This global pandemic has temporarily upended the way most companies do business and engage with their customers. We are all still learning in this new environment, but rest assured that McWane Ductile is here, willing and ready to assist our customers in any way we can. This assistance includes one-on-one calls, virtual training and webinars hosted by our staff of water and sewer professionals.

Additionally, having been designated as an essential business, our three pipe foundries have continued to operate and provide products to our customers that are so valuable in ensuring a safe and reliable supply of water to our nation. McWane Ductile has taken all the necessary steps to provide a clean and safe environment for these dedicated women and men to continue their work, and we are especially appreciative of their dedication.

Finally, as we move further into spring, we hope that this current crisis will soon be past us and that life will return to a more normal routine. In the meantime, please know how much we appreciate all our customers' support. And please do provide us feedback on our new look — we look forward to hearing from you.

Stuart Liddell
Sales Operations Manager
Sales Operations Department

4/20/20

Buried No Longer

Confronting America's Water Infrastructure Challenge

By **Roy Mundy**, P.E., ENV SP, Assoc. DBIA, McWane Ductile Senior Regional Engineer

The American Water Works Association (AWWA) is the premier trade association representing the drinking water industry in the United States. Through its network of paid professionals and volunteers throughout the country, AWWA has provided the drinking water industry with standards for water system operations as well as valuable research on countless subjects for many decades.

STARTING THE CONVERSATION

In February of 2012, AWWA released a research report titled "Buried No Longer," developed by AWWA under the direction of its Water Utility Council. Funding for the project was provided by the Water Industry Technical Action fund (WITAF), which receives funding through member dues. The purpose of the report can be found in its title, "Buried No Longer." The report demonstrates that, as a nation, we need to bring the conversation about water infrastructure above ground. Deferring needed investments today will only result in more significant expenses tomorrow and pass on a greater burden to our children and grandchildren. As documented in the report, restoring existing water infrastructure as it reaches the end of useful life and expanding to serve a growing population will cost at least $1 trillion over the next 25 years at the time of publication of the report.

STRATEGIC INVESTMENT DECISIONS MUST BE MADE

Because such a significant investment will be required to refurbish our nation's drinking water infrastructure in the next two to three decades, decisions on HOW these investments are made must be strategic. Materials selected to replace aging waterlines must be resilient, sustainable, operationally efficient and environmentally friendly. More than a decade ago, AWWA announced that a new era was dawning: the replacement era, which precipitated the "Dawn" report which examined 20 water systems using a relatively new technique called a "Nessie Curve." The "Buried No Longer" report extended the earlier "Dawn" report beyond the original 20 cities to encompass the entire United States. Recognizing one of the critical components noted earlier of pipeline sustainability and resilience, AWWA incorporated data in its report utilizing the "Nessie Model" charts, which shows the average estimated service lives by pipe material (average years of service). This information is segregated by region of the country, size of pipeline and types of pipeline materials considered. In viewing

this objectively developed data on page eight of the report, one notes that **in every case, Ductile iron pipe exceeds the estimated service life of Polyvinyl Chloride Pipe (PVC), in some regions of the country by as much as nearly double the estimated service life.**

SIX STRATEGIC DECISION FINDINGS

This research by AWWA incorporates six findings in its conclusion, all of which point toward the necessity to make strategic decisions for the future of our children and grandchildren and to provide a sustainable drinking water system in this country for centuries to come:

1. The Needs are Large: Because of the very significant need to replace infrastructure today, materials must be selected to put off for as long as possible these same expenditures once again, when faced by future generations.

2. Household Water Bills Will Go Up: Selecting the proper application of pipeline materials today, materials that will last long into the future, is the best investment for customers. Longer lasting assets will curtail household water bills increasing continually over time because pipelines will provide many more years of use to customers in the future.

3. There are Important Regional Differences: These differences regarding estimated service life can be accommodated in pipeline material selection throughout the country, as noted in the "Buried No Longer" report.

4. There are Important Differences Based on System Size: Once again, these differences can be accommodated in accordance with the "Buried No Longer" report.

5. The Costs Keep Coming: Because the costs KEEP COMING, material selection of pipeline infrastructure must be strategic to restrain escalating costs in the future, which can even further spiral out of control if assets must be replaced sooner rather than later due to shorter estimated service lives.

6. Postponing Investment Only Makes the Problem Worse: The good news is that selecting a pipeline material with a longer asset life will allow the water utility to have confidence that replacement now will allow for more than a century of estimated service life when using Ductile iron pipe in lieu of many other waterline pipeline materials.

The concluding paragraph of the "Buried No Longer" report states, "Finally, in many cases, difficult choices may need to be made between competing needs if water bills are to be kept affordable. Water utilities are willing to ask their customers to invest more, but this investment must be in things that bring the greatest actual benefit to the community. Only in that spirit can we achieve the goal to which we all aspire, the reliable provision of safe and affordable water to all Americans."

STRATEGIC MATERIAL CHOICES, NOW AND FOR THE FUTURE

Having managed water utility systems for several decades, I have seen firsthand the appreciation customers have for decision-makers at their drinking water utility who think strategically for their best interest. Customers become frustrated when they realize that system facilities were purchased and installed with a tactical viewpoint, recognizing they will have to pay once again for a short-lived asset. This research report, "Buried No Longer," developed by our nation's leading trade representative for the drinking water industry, provides an objective roadmap to utilities when decisions are made regarding the material selection for their pipeline replacements as well as new infrastructure in the future.

ABOUT THE AUTHOR

Roy Mundy, P.E., ENV SP, Assoc. DBIA

Roy is a Senior Regional Engineer for McWane Ductile, assisting utilities and engineering firms with value engineering on pipeline projects, education in pipeline material selection and specification development and updating. He is a member of AWWA, NSPE, KSPE, ASCE, DBIA and KYRWA. Roy is a Registered P.E. in six states.

McWANE DUCTILE

Would you trust plastic on a bridge?

Didn't think so.

There's one big reason why Ductile iron pipe is recommended over PVC for major infrastructure projects: Iron is stronger than plastic. McWane Ductile iron is cast in fire and proven under pressure to outperform PVC in nearly every category. It's extremely resilient and durable enough to last a lifetime, withstands harsh environmental conditions and even offers a pumping cost savings of up to 37 percent. And because it's made with more than 95 percent recycled materials, McWane Ductile iron pipe provides greater long-term cost efficiency and is better for the environment than any competing product.

McWane Ductile: Cast **STRONGER,** Lasts **LONGER.**

McWaneDuctile.com

POCKET ENGINEER
Available for **iOS + Android**
or online at **pe.mcwane.com**

Welcome to The Ditch Doctor, where we provide answers to your most often asked questions about Ductile iron pipe. These are real-world questions coming from hard-working professionals in the water industry... just like you. YOU ASK, WE ANSWER!

DEAR DITCH DOCTOR,

We are installing Tyton® pipe with restraint gaskets, following every detail for proper installation. We are supposed to pull out on each joint to lock in the restraint, correct? Is it okay if the pull-out is 1.5 inches before the gaskets lock? I also noticed some Fast-Grip® gaskets at the jobsite.

Fast-Grip gaskets work in Tyton bells, right? Brent tells me to stop bugging him and go to lunch. I can't possibly eat with this much stress.

Help!
Harry from Hadley

DEAR HARRY,

Good to hear you are concerned because your concerns are justified. What's not good to hear is the words Tyton and Fast-Grip in the same sentence.

The pull-out is much less than 1.5 inches per joint. Therefore, STOP. Fast-Grip gaskets do not fit in Tyton bells. You must re-install all joints in question. One other small detail that has HUGE ramifications is to use a simple paper clip as a feeler gauge to check the joints for proper installation. You or Brent would have detected an issue on the first joint had you followed this simple step. Now re-install the joints then schedule on-site training with a McWane Ductile Professional. Less stress, better eats, buddy.

Later man,
Ditch Doctor

DEAR DITCH DOCTOR,

Freddie continues to tell me his guys do not need to use an outside diameter (OD) tape to check pipe prior to cutting. Freddie says the pipe pieces marked green are the "super-duper good pipe" and his guys don't need to waste time checking pipe. I just don't get it. I have watched his guys spend close to 30 minutes cutting a 24-inch pipe and then see them struggling to assemble the pipe with a restraint gland & MJ 90. Am I missing something? If so, what? Because I just don't understand.

What kind of advice can you offer?

Cindy from Cimarron

DEAR CINDY,

Well Cindy, I don't get it either. Measuring the OD takes less than a minute, yet I have seen the same thing you have noticed on numerous occasions. So, here is the skinny on the fat pipe: the maximum OD for a 24-inch pipe is 25.85 inches. The minimum inside diameter (ID) for a retainer gland is 25.87 inches. Wow, .02 inches difference. Not much, and those components are rather heavy, so yes, frustration can quickly rise. Now, if the operator was to measure and cut a pipe with an OD of 25.79 inches (which is within specification), there is now .08 difference between the OD & ID.

You may think that doesn't sound like much, but hey, you just more than doubled the difference between the two. The installation will now go much better. I would ask the operators a similar question, "Do you take the time to measure the length of pipe needed to fit between two fittings?"

Happy cutting, Cindy,
Ditch Doctor

How to Prevent Stray Current in DI Pipe at Gas Line Crossings

By **John Simpson,** P.E., McWane Ductile Regional Engineer

In today's construction world, things are getting more and more technical and precise. As the waterworks industry has evolved over the last 100 years, our understanding of installation processes has as well, specifically concerning stray currents emitted in the ground from a steel gas or oil pipeline's cathodic protection system and how they might influence the corrosion of adjacent Ductile iron (DI) pipelines.

WHAT ARE STRAY CURRENTS?

Stray currents pertaining to underground pipelines are direct currents flowing through the earth from a source not related to the pipeline being affected. When these stray direct currents accumulate on a metallic pipeline or structure, they can induce electrolytic corrosion of the metal or alloy. Sources of stray current include cathodic protection systems, direct current power trains or streetcars, arc-welding equipment, direct current transmission systems and electrical grounding systems.

To cause corrosion, stray currents must flow onto the pipeline in one area, travel along the pipeline to some other area or areas where they then leave the pipe (with resulting corrosion) to re-enter the earth and complete the circuit to their ultimate destination. The amount of metal lost from corrosion is directly proportional to the amount of current discharged from the affected pipeline.[1]

KNOW WHAT'S BELOW!

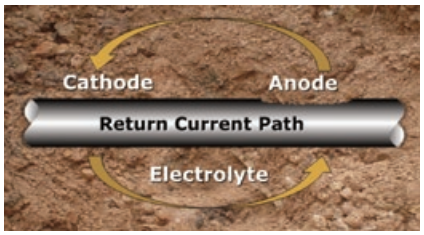
As road construction ramps up in the United States, the issue of stray current has become something municipalities and engineers should be aware of given most road right of ways (ROW) have utilities located within them. The coordination between utilities and the U.S. Department of Transportation is vital to ensure that existing and new utility pipelines are not adversely impacted by stray currents from a steel gas or oil pipeline's cathodic protection system.

It should be noted that cathodic protection of oil and gas pipelines is not a choice in the United States. It is a federal law due to the potential safety hazard to people and the environment should one fail. For waterlines, cathodic protection is a design decision based upon weighing the likelihood versus the consequences of a corrosion-related pipeline failure.

A steel gas or oil pipeline is a continuous conduit without gasketed joints. Certified welders connect the pipeline in the field by welding the pipes together. Once the steel pipeline is set in place, the applied corrosion protection mechanism, namely cathodic protection, requires periodic inspections and perpetual maintenance.

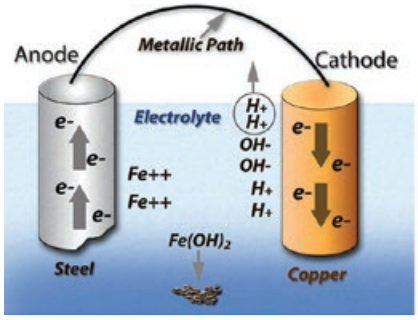
CORROSION PROTECTION USING CATHODIC PROTECTION

Corrosion protection can be achieved by cathodic protection (CP). CP is a designed process where direct current (DC) is applied to an exposed metal surface to slow and redirect corrosion currents. When properly used, CP steers the destructive currents safely away from the pipeline metal and onto a planned sacrificial metal anode located nearby.



HOW DOES CATHODIC PROTECTION WORK?

Cathodic protection generally works by placing one or more anodes (external devices) in a conductive electrical connection with the pipeline to create a protective circuit. Current flows from the anode through the connection to the



surface of the pipeline, now forced to be a cathode, an electrically protected surface. Remember, corrosion of metal occurs where the current leaves the metal surfaces, not where it comes on to it. It's essentially the opposite of a lightning strike, and, of course, with dramatically less energy involved.

A sacrificial anode consists of a galvanically less noble metal than the metal to be protected and is electrically connected to the pipeline to be protected. The anode is more reactive to surrounding corrosive environments. The sacrificial anode corrodes, protecting the metal of the pipeline. The anode beds for the gas or oil pipeline's cathodic protection are located close to existing or new metallic pipelines. This closeness in proximity affects corrosion.

A REAL-LIFE SCENARIO ON HANDLING POTENTIAL STRAY CURRENT

Recently a 12-inch waterline relocation project located near Nashville, Tennessee, was brought to our attention. The project involved the widening of approximately 3,000 linear feet of an existing two-lane road to a four-lane road. All existing utilities within the ROW were to be relocated and extended. Within the road widening project was an existing 60-foot steel gas line easement that ran almost perpendicular to the road.

THE FOLLOWING IS A SUMMARY OF THE PROCESS TO DETERMINE IF ADDITIONAL PROTECTION IS REQUIRED FOR THE DI PIPE.

- Acquire general project information. Typically, the plan and profile of crossing, utility, civil engineer, gas or oil companies contact information, and exact project location.
- Contact the gas or oil company and gather information on the cathodic protection system used for their pipeline — generally looking for the location of the cathodic protection rectifier and anode beds. In doing so, confirm that the inspections and maintenance of anodes contained within the CP system's original design are indeed occurring. Without that, you've got a system planned to protect the pipeline that's destined to fail. Like a lawn never mowed, it just becomes an utter mess.

MEET ON-SITE AND FIELD TEST

- If sufficient information on the cathodic protection rectifier and anode beds is not known, set up a meeting with the gas or oil company representative on-site at the potential pipeline crossing to review the cathodic system.

- Based upon the location of the rectifier, anode bed and type of cathodic system used, the DI pipe manufacturer and the Ductile Iron Pipe Research Association (DIPRA) will determine if field testing is required. Field testing helps to determine the exact location of the cathodic protection zone of influence.

GATHER RECOMMENDATIONS

- After gathering appropriate information, the DI pipe manufacturer and DIPRA can provide recommendations concerning the protection of the DI pipe. The recommendations generally advise no additional protection of the pipe is needed. For helpful information on Corrosion Protection please visit McWaneDuctile.com/Blog.

- On rare occasions such as extremely corrosive soils, a proposal would be to wrap the pipe with polywrap/V-Bio® within the gas line easement or cathodic protection zone of influence. Or wrap the pipe with polywrap/V-Bio® and bonding the joints while providing a current tie back through direct contact to the gas pipeline gas system.

NEED ASSISTANCE WITH YOUR WATERWORKS PROJECT?

The above recommendations are easily applied to the pipe and will not increase the cost of the DI pipe substantially. The little amount of additional work required to provide a recommendation for the DI pipe is provided at no charge to the owner or engineer. If you have any questions or need additional information, please feel free to contact your local McWane Ductile Representative at McWaneDuctile.com.

SOURCES

1. W. Peabody, Control of Pipeline Corrosion, National Association of Corrosion Engineers, Houston, Texas.

2. Richard W. Bonds, P.E., Corrosion Control — Stray Current Effects on Ductile Iron Pipe, Ductile Iron Pipe Research Association, Birmingham, Alabama

ABOUT THE AUTHOR

John Simpson, P.E., NACE CT

John is a Regional Engineer for McWane Ductile, assisting engineering firms and utilities with value engineering on pipeline projects, education on specification issues and presenting about proper pipeline material selection. John is an active in AWWA and has served on the board of TSPE and ASCE. John is a Registered P.E. in Tennessee and Alabama.

West

PROJECT PROFILE

PROJECT PROFILES

Banning, CA, job site

The City of Banning is strategically located astride Interstate 10 in the San Gorgonio Pass. The city, incorporated in 1913, has a rich and colorful history. Initially, Banning served as a stagecoach and railroad stop between the Arizona territories and Los Angeles.

Banning is a friendly and wholesome place to work and raise a family. The city features clean air, ample water supplies and the memorable and inspiring scenic vistas of Mount San Gorgonio and Mount San Jacinto.

Pardee Homes Atwell project is a 1,500-acre master-planned community in Banning and will provide over 4,000 new single-family homes. As the demand for housing in the inland empire is secure, phase one at Atwell has begun. It will consist of 480 homes, retail pads and one K–6 school.

Located at the base of the San Bernardino Mountains with views of the adjacent San Jacinto Mountains, Atwell is characterized by its scenic surroundings. It is conveniently located near Interstate 10 and approximately 80 miles east of Los Angeles. A scenic trail system of about eight miles will be open to the public when the building is complete.

Banning is a friendly and wholesome place to work and raise a family. The city features clean air, ample water supplies and the memorable and inspiring scenic vistas of Mount San Gorgonio and Mount San Jacinto.

Sales Region: West
Sales Representative: Carolyn Lopez
Project Location: Banning, CA
Project Owner/Utility: Pardee Homes/City of Banning
Project Contractor: BT Pipeline, Jeff Carpenter
Project Distributor: Core & Main Perris

Types of Ductile iron pipe used on the project:

DIAMETER	JOINT	CLASS	FOOTAGE
12"	Tyton®	350	11,809
8"	Tyton®	350	9,006
6"	Tyton®	350	638

Sales Region: Midwest
Sales Representative: Dillon Huth
Project Location: Mount Pleasant, WI
Project Owner/Utility: Village of Mt. Pleasant
Project Engineer: Foth Engineering
Project Contractor: Globe Contractors Inc.
Project Distributor: Ferguson Waterworks Pewaukee

Types of Ductile iron pipe used on the project:

DIAMETER	JOINT	CLASS	FOOTAGE
36"	Tyton®	250	5,262
36"	TR Flex®	250	5,029
36"	Tyton®	250 Protecto	2,233

PROJECT PROFILE

Midwest

The Village of Mt. Pleasant has experienced quite a bit of growth over the years. With the building of Foxconn electronics manufacturing plant, a rebuilt sanitary sewer infrastructure was necessary. Foth Engineering led the design work for this project that was comprised of several phases, this being phase 5; however, there is in total 7 miles of 36-inch force main.

Globe Contractors Inc. has been working on this job, with this phase of completion expected to be the end of July 2020. Based in Pewaukee, Wisconsin, Globe has been serving the state of Wisconsin and the Upper Peninsula of Michigan since 1971.

Upon completion of this entire multi-phase/multi-year project, the Village of Mt. Pleasant will have a substantial infrastructure enhancement to support the continued growth of the residential and commercial building.

Mt. Pleasant will have a substantial infrastructure enhancement to support the continued growth of the residential and commercial building.

Mount Pleasant, WI, job site

South

CUSTOMER PROFILE

Charlie and Linda Tidwell

INTEGRITY + TRUTH = SUCCESS OF VOLUNTEER UTILITY SUPPLY

In this industry, we are successful only through those we are lucky enough to build partnerships with. That is why in this edition of Iron Strong Insights, we are paying tribute to a longtime partner of McWane Ductile in the South: Volunteer Utility Supply.

Charlie Tidwell opened Volunteer in 1979 with the business located in his hometown of Mt. Juliet, Tennessee. He continued to service middle Tennessee with all their pipe, valves and fittings needs until 2019 when he decided it was time to close shop after 40 years in the business.

Since Charlie first opened his doors in 1979, he has been a part of the McWane family by becoming a stocking distributor of Clow Water Systems and then later for McWane Ductile. Volunteer didn't stop being a part of the McWane family with their choice in Ductile iron. They were a loyal stocking distributor of M&H Valves as well.

Ernie Milteer, with M&H Kennedy, had this to say about Charlie and his time working with Volunteer, "I met Charlie Tidwell 20 years ago. As an independent supply house, Charlie's concern was that he always be treated the same as the larger chain supply houses. He was blunt but fair, and he became one of McWane Ductile's largest distributors in the middle Tennessee area. He had the respect of the area's largest utilities and was solely responsible for their inventories: West Wilson, Gladeville, White House and Metro Nashville, to name a few. I often received my share of complaints, and many times before the beginning of our meetings, we were in jeopardy of losing Volunteer as our distributor, but after lunch, everything would be okay. A sales call that I used to dread became a meeting of friends that discussed markets and trends. Charlie will always be someone that I have a deep respect for as the man who signed the checks, from payroll to accounts payable, to keeping the lights on. I wish him well and will always miss our meetings."

Since Charlie first opened his doors in 1979, he has been a part of the McWane family by becoming a stocking distributor of Clow Water Systems and then later for McWane Ductile.

Terry Lynch, Sales Manager for McWane Ductile, had this to say about Volunteer, "I first met Charlie and his team in 1996. At first, I wasn't sure what to make of them until I realized they didn't play games. What they told you was the truth. I wasn't quite sure how to take that, no games. I learned to appreciate their business approach very quickly. We moved upwards of 10 thousand tons of pipe over the years due to Charlie and his team's relationships in the industry. It's tough to see them go, but I understand it is time to move on. I wish Charlie Tidwell, Herman Adams, Jerry Holt, Christy Brown and Dawn Fox nothing but the best in the future. And I am happy I can call them friends."

We want to sincerely thank Volunteer Utility Supply and their countless employees for being such a great partner over the past 40 years, and it will not be the same without you in the industry.

Sales Region: Northeast
Sales Representative: Benjamin Leonard
Project Location: Sparrows Point, MD
Project Owner/Utility: Tradepoint Atlantic Development
Project Engineer: Baltimore County Engineering Department
Project Contractor: CCS
Project Distributor: Ferguson Whitemarsh

Types of Ductile iron pipe used on the project:

DIAMETER	JOINT	CLASS	FOOTAGE
16"	Tyton®	54	5,325
12"	Tyton®	54	143
8"	Tyton®	54	60
6"	Tyton®	54	149
4"	Tyton®	54	36

PROJECT PROFILE

Northeast

In the fall of 2014, Sparrows Point Terminal LLC purchased the former Bethlehem Steel 3,100- acre site to redevelop this once-booming manufacturing site. One of the many items through this site development has been upgrading all the aging infrastructure. Jeff Pelusa from the Baltimore County engineering department said, "This site development has been on a fast-paced schedule upgrading the infrastructure that is fed from two 36-inch meters." McWane Ductile has already been involved in replacing several water lines over the last four years ranging in sizes from 36-inch down to 6-inch."

Several large diameter Ductile iron pipe water mains, including a 48-inch line and multiple 36- to 16-inch water lines, create reliable flow and pressure throughout the whole property loop.

Since the beginning of development, large retailers have moved into some of the 1,000,000 plus square foot warehouses such as Under Armour, Home Depot, Amazon, FedEx, Floor Décor and others.

There are still 15,000,000 square feet of retail space left to be developed and occupied on the site.

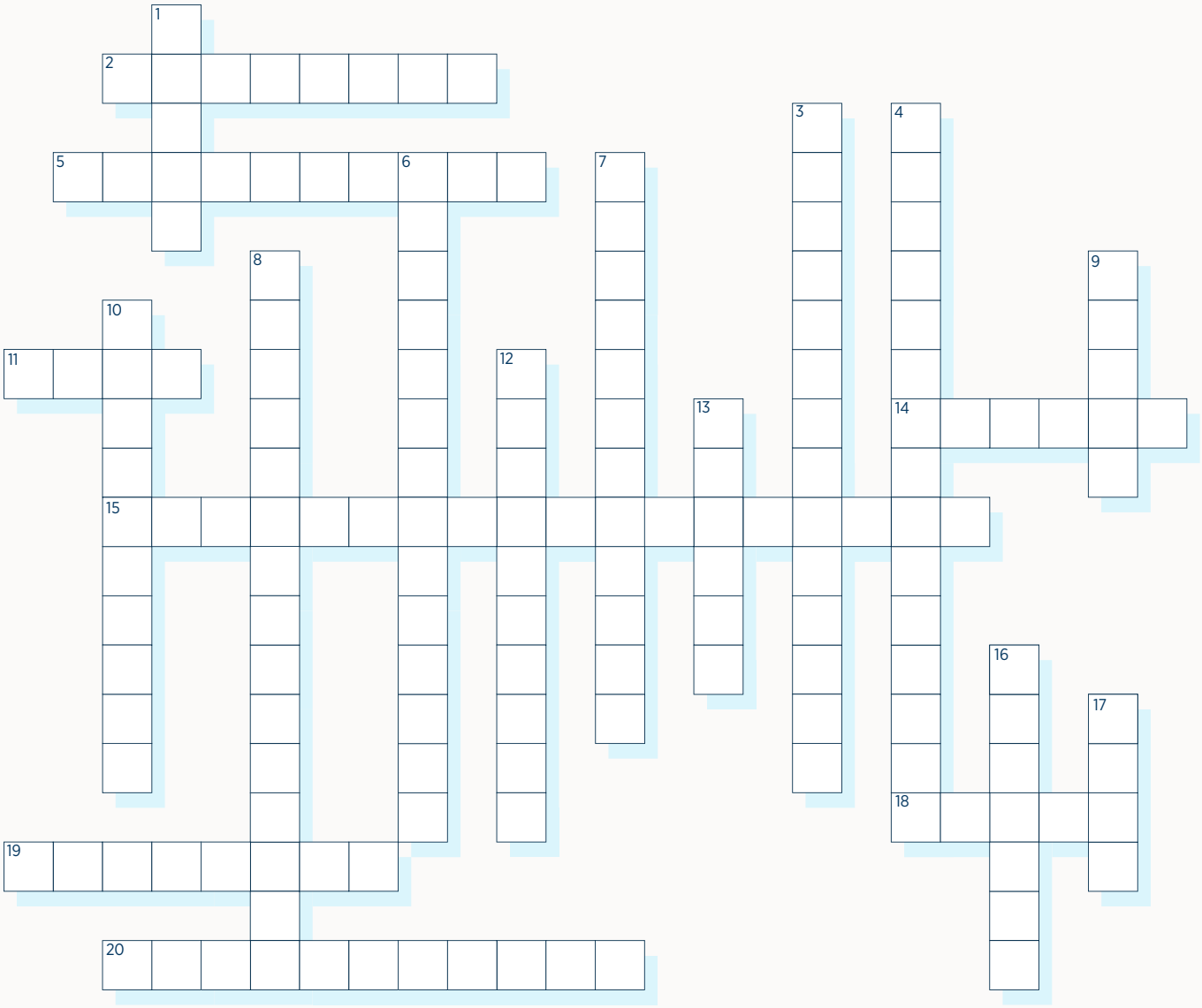
The latest project that McWane Ductile has been involved with was a 5300-foot-long 16-inch Tyton® Class 54 Pritec-coated waterline that ran east to west along the north side of the site.

The job had many obstacles, such as dealing with unknown contents underground at the former manufacturing site as well as installing pipe underneath the rail-line that circles the perimeter of the job site. Consolidated Construction Services, the contractor installing the pipe, did a great job installing the complete waterline with full cathodic protection in the winter of 2019.

"This site development has been on a fast-paced schedule upgrading the infrastructure that is fed from two 36-inch meters."
— Jeff Pelusa

Sparrows Point, MD, job site

PIPELINE PUZZLE



ACROSS

2. Sticker on the pipe that provides information and certification details
5. Ability to withstand water, pressure, or damage
11. Type of polyethylene encasement that protects pipe from corrosion
14. Most widely accepted and installed integrally cast restraint joint system in the ductile iron pipe industry
15. New name of McWane Ductile's quarterly newsletter
18. Predominant gasket employed throughout the ductile iron pipe industry
19. Direct channel for clean water to get through
20. Ceramic epoxy lining for ductile iron pipes

DOWN

1. McWane Ductile is a part of this national organization
3. Online calculator provided by McWane to help contractors/ customers in the field
4. A way in which a pipeline can be tested for strength and leaks
6. Basic physical and organizational structures and facilities needed for operation of a society
9. Main substance that travels through our pipe
10. Location of McWane, Inc. headquarters
12. Name of the McWane Ductile blog (and a popular hashtag)
13. This is put in place to lock a piece of pipe together
16. Tough but flexible
17. Type of coating that helps protect pipe

ACROSS 2. millcert 5. durability 11. vbio 14. trflex 15. ironstrongnsights 18. tyton 19. pipeline 20. protecto401 DOWN 1. dipra 3. pocketengineer 4. hydrostatictest 6. infrastructure 7. cementlining 8. mechanicaljoint 9. water 10. birmingham 12. ironstrong 13. gasket 16. ductile 17. zinc

MIKE DODGE, VP SALES & MARKETING

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HELPING THE WATER AND WASTEWATER INDUSTRY REMAIN STRONG ... IRON STRONG.

IT'S A NEW AND EVER-CHANGING ERA ... and the upkeep and monitoring of our nation's water infrastructure are more critical now than ever. McWane Ductile appreciates essential water and wastewater service provided across our society, and we recognize our current situation of responding to the COVID-19 pandemic has potentially stressed the resources of many utilities throughout the country. We're offering our support by providing our resources and assistance to these utilities whenever possible. McWane Ductile is committed to **Building Iron Strong Utilities for Generations.**

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