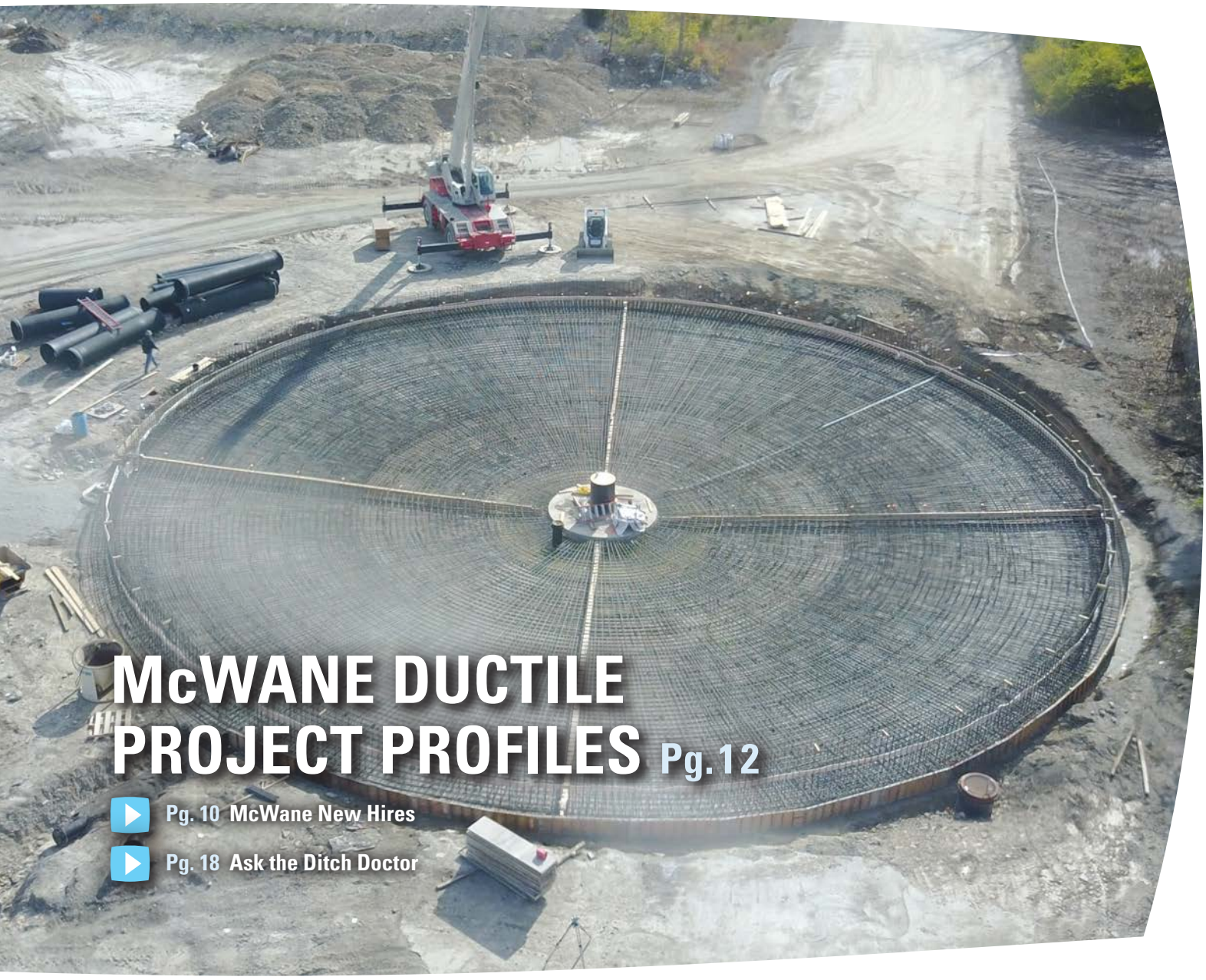
SPRING 2018

MODERN MCWANE



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McWane Ductile

INTRODUCING THE NEWEST MCWANE PE CALCULATOR (PG. 4)

INSIDE

MD | IRON STRONG

WELCOME TO MODERN McWANE

Dear Readers,

Well, it took a while for some of us, but spring 2018 has finally arrived and with it comes a time for change and new beginnings. We here at McWane Ductile are undergoing several changes by adding new personnel and services, all with the intent to better serve our customers' needs. One of these changes is renaming the Marketing and Specifications Department to Sales Operations.

No matter the name, our staff of Product Engineers and Regional Engineers are just as committed as ever in assisting our customers and their communities in remaining Iron Strong. These efforts are detailed in the introduction of our new calculator for Horizontal Directional Drilling (HDD) projects. Please see the article by Ken Rickvalsky, Product Engineer, explaining the simple effectiveness and utility of this newest addition to the McWane Pocket Engineer.

We are also proud to announce two new services that have been made available through McWane Ductile – Soil Testing and V-Bio® Test Sites. These corrosion prevention services are offered to existing and potential customers to better understand the environments that their projects are being constructed in and to provide solid advice for the need (if any) and type of corrosion protection they may require. Further follow-up on these services and the test sites will be provided by John Johnson and Jerry Regula in upcoming issues of Modern McWane.

There are several new employees again this quarter, and we have included brief introduction for each of them. Please welcome Jeff Henderson, National Account Manager; John Simpson, Regional Engineer covering the Southeastern states; Clinton (CJ) Fowler, Sales Representative for Southern Illinois and Eastern Iowa; and Jim Yancey, Sales Representative for Tennessee.

Our regional Project Profile section highlights several significant and interesting pipe installations. Please be sure to check out the East article on the City of Troy, New York, and their effort to upgrade a 111-year-old steel pipe line with new ductile iron pipe, a decision that should ensure Troy another century of reliable service for their community. Also check out the Treatment Plant article, our cover photo for this issue, and the City of Piqua's ongoing improvements to their wastewater treatment facility, a project that is expected to be completed in May 2020. And as always, the popular Ditch Doctor section provides advice from the field for questions regarding the design and installation of ductile iron pipe.

As summer approaches, we look forward to seeing you at the AWWA/ACE conference in Las Vegas. McWane Ductile will be the pipe supplier for this year's tapping competition, which will begin on Tuesday, June 12. Please stop by our booth (#23033) to find out more about the ongoing changes and improvements at McWane and our efforts to continue **Building Iron Strong Utilities for Generations** to come.

Stuart Liddell
Sales Operations Manager
Sales Operations Department

JOIN McWANE DUCTILE AT ACE18

Join McWane at Mandalay Bay Resort and Casino in Las Vegas for three days at AWWA's biggest event of the year! We'll be in Booth #23033, June 11–14, sharing the latest news on everything going on at McWane. Visitors can also take a break from the sights and sounds of Sin City to watch the show's annual pipe tapping competition with pipe provided by McWane Ductile! ACE18 is almost here, so book your trip today.

AWWA COMPETITION PIPE TAPPING

Tuesday, June 12
2:00–5:00 p.m. . . . . Preliminaries

Wednesday, June 13
10:00 a.m.–12:15 p.m. . . . . Preliminaries
1:45–6:00 p.m. . . . . Preliminaries

Thursday, June 14
11:00 a.m.–2:00 p.m. . . . . Finals

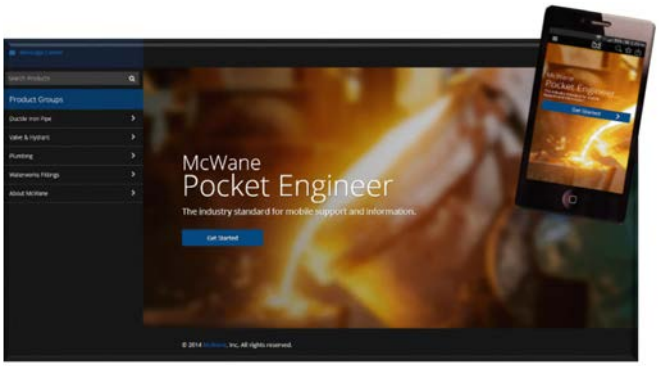
PPP for HDD with DIP

INTRODUCING THE NEWEST MCWANE PE CALCULATOR

BY KEN RICKVALSKY, MCWANE DUCTILE PRODUCT ENGINEER

"Oh, that's not gonna work!" is the last thing anybody wants to hear, especially if you're a design engineer putting plans out to bid or a general contractor coordinating with a subcontractor. Proper Prior Planning is a good idea in any endeavor, and it's certainly true with utility pipeline construction. In the last decade or so, an ever-increasing amount of pipeline segments are being installed by Horizontal Directional Drilling (HDD). Twenty-five years ago, directional drilling installations were typically limited to crossings under waterways or highways. With a growing emphasis on the delicate balance between new construction and preserving natural environments, the number of HDD installations is steadily increasing. Given the innate strengths and resiliency of ductile iron pipe (DIP), it has emerged as a leading option for such installations. Not to mention, DIP itself is manufactured from 95 percent or more recycled materials, which makes it sustainable and environmentally friendly.

THE MCWANE POCKET ENGINEER



From its debut in June 2012, the McWane Pocket Engineer (PE) is a versatile utility pipeline app that helps with all phases of specifying, planning, computing, purchasing, installing, and testing your projects. Download it for free download from the iPhone App Store or Google Play store. The downloaded version operates without your phone being connected to the internet, just like any other app. The website version is also available to use for free while internet connected (phone or computer) at pe.mcwane.com. The HDD Variable Profile Calculator is new to the McWane PE, and joins the 10 calculators covering Thickness Design, Thrust Restraint Design, Energy Savings Cost Analysis, AWWA Hydrotest Allowances, and other critical design or testing considerations. Plus, the McWane PE also contains comprehensive product data and information, sales contacts across the United States, informative videos, the entire DIPRA publications library, an FAQ section, and the McWane Pipe Economy Handbook in all it's digital glory. This digital version can easily be saved to your computer and/or printed into a ringbinder format for your office or jobsite library. The colored-font subjects and sections of this handbook's digital cover serve as (click) direct-links to the subject within the body of the McWane Pipe Economy Handbook. All said, McWane Ductile now serves as one united nationwide entity wholly owned and operated under the McWane, Inc. umbrella and standards of safe excellence.

CONTENT AND STRUCTURE

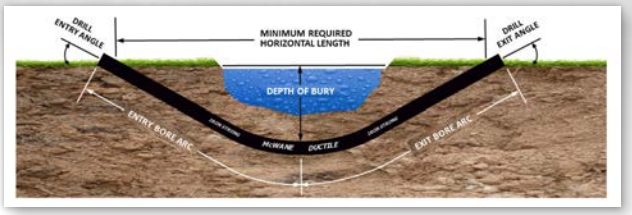
The HDD Variable Profile Calculator is named as such because complete control of the entry and exit bore geometry is in the hands of the user, and can vary from each other in terms of the percentage of available deflection to be used and the depth of the bore. This allows the user to tailor each end of the bore to whatever ground conditions, desired layout, or other requirements they need to meet. The central (horizontal) section, should there be one, is computed accordingly and automatically by the calculator. Based on simple input from the user (pipe diameter, deflection percentage desired, depth of bore, and total planned length across the entire installation), the calculator will quickly compute and report the average joint deflection used, the bore radius and (arc) laying length, the average offset per pipe length, the required horizontal surface length, the entry and exit drilling angles, and the number of full-length pipes used. These results are computed and reported in tabular fashion for both the entry and exit bore sections. The central (horizontal) section and results across the entire bore are also reported, including actual total span length along the surface (feed pit to pull pit), the total lay-length along the proposed pipeline, total number of pipes to construct the pipeline, and a percentage of the safe recommended maximum pull force for the pipe diameter involved (based on an AWWA DIP thickness class 52 pipe wall). A graphical representation of the proposed idealized profile is included on the results screen and/or printout.

RESULTS EXPLAINED

Based upon the selected pipe diameter, the necessary product data (nominal pipe lengths, rated maximum joint deflection, nominal pipe weights, maximum recommended safe end-pull force) is retrieved and utilized automatically by the calculator from its encoded database. The user has the option to enter any value between one and 100 percent of available deflection for both the entry and exit bore sections. This will independently compute the entry and exit bore profiles, and report them stitched together with a horizontal central section if needed to equal to the planned overall surface length entered, thereby representing the entire bore as a single pull string.

Perhaps the single most important gauge of whether or not the drilling contractor is going to greet you with the opening statement of this article is the drilling angle. Industry standards developed over the years and in accordance with drilling machinery parameters and the want for trouble-free efficient bores determine the drilling entry angle to be between 8 and 16 degrees from the ground surface, while the drilling exit angle range is 5 to 12 degrees. Another good rule of thumb commonly incorporated on HDD installations is to have a minimum separation of 20 feet between the waterway bottom or other obstruction being crossed to avoid unwanted difficulties. Clearly this could change based upon the soil type or rock involved in the bore path. These are not stringent limits per say, more so time-proven workable parameters that won't give drilling contractors palpitations or stress their machinery. The drilling angle is essentially a rise over run (laws of triangles) result from the (input) bore depth and the (computed) horizontal surface length of the bore section in question.

The computed percentage of maximum recommended safe end pull used by the entire bore does not consider the involvement of buoyancy (reduced drag) if the pipeline is in a water-filled or drilling-mud-filled bore path, nor does it consider any potential frictional loads (increased drag) if the pipeline comes in contact with the walls of the bore at any point. There is considerable safety factor invoked in the computation of this result, and therefore, serves merely as a general guide to determine if you need further analysis. These factors (buoyancy or drag) can be a much more complicated discussion than what this calculator is intended for, and should be addressed by a qualified professional on a case-by-case basis. Most drilling contractors have their own methodology or parameters based on their level of experience.



HDD Geometry Calculator — Variable Profile Calculator

Quickly compute an optimized directional drilling profile with minimal user input towards maximum understandable results. User controls the average deflection used and depth of the bore through the entry and exit portions of the profile, while this calculator does the rest; including determination of whether or not a central horizontal section is required.

User Input

Nominal Pipe Diameter (in)	Total Planned Horizontal Length Across Surface (ft)
24	1500.0
Entry Bore: Joint Deflection Used (%)	**Entry Bore: Depth of Bore (ft)**
75.0	20.0
Exit Bore: Joint Deflection Used (%)	**Exit Bore: Depth of Bore (ft)**
75.0	30.0

Reference/Product Data

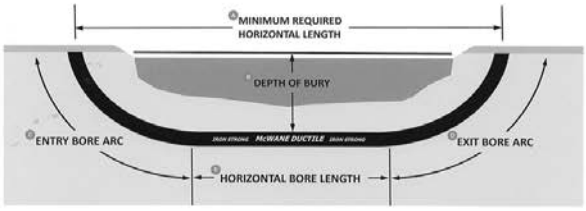
Pipe Length (ft)	Rated Deflection (deg)
17.76	2.25
Entry Central Angle (deg)	**Exit Central Angle (deg)**
0.52	0.63

Computed Results

	ENTRY	EXIT
Min. Avg Deflection Used	1.69 degrees	1.69 degrees
Min. Radius of Bore (arc)	603.0 feet	603.0 feet
Average Offset per Pipe Length	6.3 inches	6.3 inches
Min. Required Horizontal Surface Length	154.0 feet	187.8 feet
Min. Bore (arc) Lay-Length 30.0ft	155.7 feet	191.0 feet
Min. Number of Pipe Used for (arc)	8.8 pieces	10.8 pieces

	HORIZONTAL
Computed length	1158.2 feet
Min. Central Horizontal Bore Length	1158.2 feet
Min. Number of Pipe Used In Central Section	65.22 pieces

	COMPUTED ACROSS THE ENTIRE BORE
Min. Computed Horizontal Length	1,500.0 feet
Min. Total Lay-Length of Entire Directional Bore	1,504.9
Min. Total Number of Pipe for Entire Bore	84.8
Entire bore (with no buoyancy/no drag force) considered utilizes	70.4% *of max. recommended pull force for 24-inch TR Flex class 52 ft DIP*



Contact a McWane Ductile Product Engineer or your local McWane representative for additional design considerations and information.

INTRODUCING THE NEWEST MCWANE PE CALCULATOR

REAL-LIFE APPLICATION

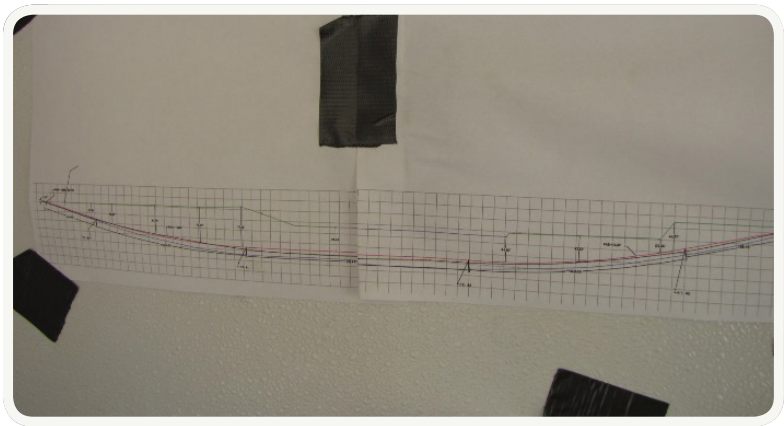
A prime example of an HDD installation of DIP is summarized in the pictures below, which are from a 1,500-long drill and pull HDD installation of 24-inch restrained joint pipe. The pipeline ran from southwestern Pennsylvania into West Virginia for water supply to a new power plant being constructed in 2010. Midway along the pull, this pipe was 150 feet below the surface of the Monongahela River (60 feet into the bedrock), using drilling mud as a cutting lubricant for the drill head. The mud in the bore during the pipe pull provided significant buoyancy wherein the pull force experienced never exceeded 40 percent of the estimated value (i.e., the dead weight of the pipe).

Diamond bit drill head capable of a 42-inch diameter bore through the bedrock, cooled by recirculating bentonite slurry.

Connecting the drill rig pipe to the assembled DIP pipeline and puller head. Think of oil rigging laid down on its side.

1,500-foot-long 24-inch restraint joint DIP pipeline fully assembled prior to beginning the pull-through.

Assembled pipeline will play "follow the leader" behind the puller-head and driller pipe through the pre-drilled bore.



HDD Profile developed by the drilling contractor, taped to the booth wall of drillrig operator.

Drill rig operator's master control panel on the West Virginia (receiving side) of the HDD installation.

SUMMARY

The McWane PE HDD Variable Profile calculator is meant to be used as a practical and reliable first tool for any HDD pipeline installation using restrained joint DIP (TR Flex® if manufactured by McWane). It is not meant as the final profile, as every underground project could have unknowns in the early stages of planning. It's not until all pertinent information is explored and charted (soil borings and other underground exploration methods) that a final profile can be established, accounting for buried obstructions or other possible concerns. That said, you can't finish well if you don't start correctly, and the McWane PE HDD Calculator without a doubt will set you up with a great first step! McWane product engineers are available anytime (free of charge) to assist you with this calculator or other utility piping needs. We are here to help you.

NEW SERVICES

SOIL TESTING & V-BIO® CORROSION TEST SITE

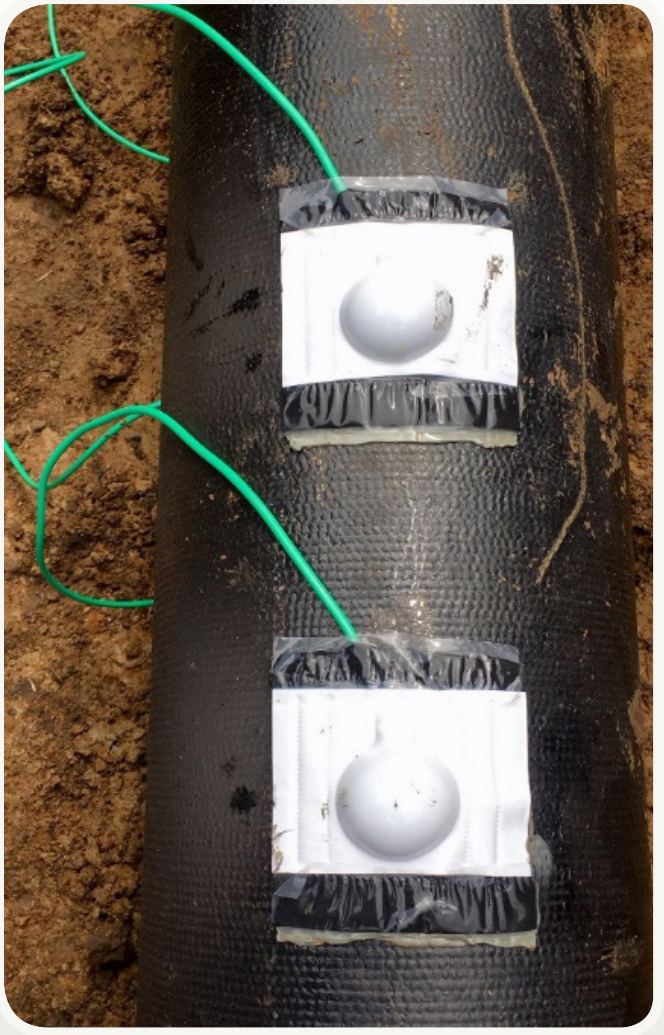
BY JOHN JOHNSON, MCWANE DUCTILE REGIONAL ENGINEER

In the spirit of enhanced customer support, McWane Ductile is offering corrosion prevention services by way of Soil Testing as well as Corrosion Test Sites. Our goal is to support existing customers and promote the use of ductile iron pipelines in areas that may be subject to a corrosive atmsphere. Our Sales Operations Team will take the lead with NACE-certified Corrosion Technicians on staff. McWane Ductile excels above and beyond the competition by providing value-added services at typically no additional cost to our Water Professional customers.

HOW IT WORKS

In the case of Soil Testing, utilities can initiate a request through their local McWane Ductile sales representative or directly with a Sales Operations staff member. We'll respond to your request to discuss the details of the site and schedule a time to visit the site. Soil Testing to include: Resistivity, pH, oxygen reduction potential (redox), sulfides, soil conditions, moisture, potential stray current, bi-metallic considerations, and topography evaluation. Test results and recommendations for corrosion prevention are provided accordingly.

The Corrosion Test Site program is designed to show how effective corrosion prevention measures may significantly extend the life expectancy of a Ductile Iron piping system. Sites are selected based on historically known corrosive areas. Test stations are therefore strategically placed within and outside the corrosive area. Probes are installed inside and outside the V-Bio® polyethylene encasement. Readings are then taken at scheduled intervals by McWane Ductile NACE-Certified team members. Those readings are charted to compare the corrosion rates of the probes from station to station. Look for additional information in future additions of Modern McWane!



Test leads thermite welded and capped on the live Ductile iron pipeline.

Properly installed V-Bio® with test probes.

Test stations strategically placed at intervals.

Test site readings obtained by McWane Ductile NACE-Certified personnel.

McWANE NEW HIRES

JIM YANCEY

McWane Ductile welcomes Jim Yancey as the Tennessee and North Georgia Sales Representative. Jim's responsibilities will include managing sales in the Tennessee and North Georgia territory with our loyal distributors and contractors, while continuing to build our brand and educate engineers and municipalities on the strengths and advantages of ductile iron pipe. A 2006 graduate of East Tennessee State University, Jim started his career in sales with Laurel Marina Dealership. Jim and his wife reside in Bristol, Tennessee, with their six-year old son.

JEFF HENDERSON

We are pleased to announce Jeff Henderson has joined McWane Ductile as a National Account Manager. Jeff's primary responsibility will be developing and managing sales to nationally operating multi-location contractors. Jeff has more than 30 years of experience in the waterworks industry. He spent the first part of his career in various sales and management roles in distribution, then moved to manufacturing where he held roles such as National Sales Manager, Director of Waterworks, and North American Sales Manager. Jeff and his wife, Sue, live in Dublin, Ohio.

CANADA PIPE

McWANE DUCTILE

JOHN SIMPSON

McWane Ductile welcomes John Simpson as Regional Engineer. John will work closely with other sales operations staff and alongside McWane Ductile sales representatives to promote ductile iron pipe over other materials. John is a graduate of the University of Tennessee and is a licensed civil engineer in Tennessee and Alabama. John had more than 10 years of consulting engineer experience before entering technical sales, where he has now accumulated 10 years of experience working as a sales engineer. He and his wife live in Knoxville, Tennessee, with their two children.

CLINTON FOWLER

Clinton (CJ) Fowler has joined the McWane Ductile team as a Sales Representative, working in the southern Illinois and eastern Iowa territories. As an Ohio native, CJ enjoys following the Ohio State Buckeyes football program and is also a fan of the Pittsburgh Steelers. He and his wife, Rochele, along with their two children, Rayne (6) and Broox (2), are looking forward to getting settled in eastern Iowa.

McWANE DUCTILE PROJECT PROFILES

EAST

Sales Region: East
District Manager: Mike Palermo
Project Location: Troy, NY
Project Owner/Utility: City of Troy
Project Contractor: Peter Luizzi & Bros. Contracting, Inc. of Albany, NY
Project Engineer: CDM Smith of Latham, NY

Types of DIP used on the project:

Diameter	Joint	Class	Footage
36"	Tyton®	53	5,300
30"	Tyton®	53	500

On January 17, 2016, the aging infrastructure under the City of Troy, NY, announced it needed attention through a break in a 33-inch diameter 111-year old riveted steel pipe on Fifth Avenue in Lansingburgh, NY, disrupting service to the City and many of its municipal customers. During the outage, some of the lost supply volume was offset by water pumped from the Mohawk River in to the treatment and distribution chain of the City. This initial break was repaired within a week by the Troy Public Utilities staff, while planning began toward a more lasting improvement by replacing a mile of this century-plus old steel main with 36-inch ductile iron pipe.

"Modernizing our infrastructure network is essential in building a 21st century city, and the full installation of this major water line ensures a stronger foundation can be laid for our community's continued economic growth and prosperity through the reliable delivery of clean, quality drinking water," said Mayor Patrick Madden.

In August of 2016, the City of Troy secured approximately $3.2M in grant funding and financing through the NYS Water Infrastructure Improvement Act and the NYS Environmental Facilities Corporation to fully fund this pipeline replacement project.

This mile-long pipeline replacement was completed in July 2017 with a public re-dedication of the pipeline and a hearty thank you to all the participants and agencies involved. The City of Troy and its bordering customers, served for more than 100 years by the best of then (1905 riveted steel pipe), will now be served for the next century-plus with the best of now (2016–17 ductile iron pipe from McWane Ductile). Iron Strong Utilities for Generations.

MIDWEST

Sales Region: Midwest
Sales Representative: Geoff Guss
Project Location: Riverlea, OH
Project Owner/Utility: Village of Riverlea — Franklin County
Project Engineer: Burgess & Niple, Inc.
Project Contractor: Elite Excavating, Inc.

Types of DIP used on the project:

Diameter	Joint	Class	Footage
8"	Tyton®	52	13,356
6"	Tyton®	52	677

McWane Ductile approached Elite Excavating's owner, Scott Fulmer, in 2017 in regards to opening up a direct relationship due in large part to Elite's reputation for honesty, quality, and craftsmanship. The Riverlea project bid on November 8, 2017, and the McWane Ductile/Elite Excavating team was read low at the offices of Burgess and Niple, Inc. in Columbus, Ohio.

McWane Ductile has supplied a couple of projects to Elite Excavating in 2017, but the Riverlea project was the biggest project to date. Elite has a number of waterline projects secured for construction throughout 2018, and McWane Ductile couldn't be happier with how this budding relationship continues to grow.

The work covered included complete replacement of the Village water distribution system, approximately 14,000 lineal feet of 6 and 8 inch Ductile Iron Pipe, with new hydrants and reconstruction of all streets within the village.

SOUTH

Sales Region: South
Sales Representative: Eddie Lowe
Project Location: Cayce SC
Project Owner/Utility: City of Cayce
Project Engineer: American Engineering Consultants
Project Contractor: Barwick Plumbing Company

Types of DIP used on the project:

Diameter	Joint	Class	Lining	Footage
16"	Tyton®	250	Protecto 401™	1,880
12"	Tyton®	350	Protecto 401™	1,660
10"	Tyton®	350	Protecto 401™	18
8"	Tyton®	350	Protecto 401™	54

Much of this project was in close proximity to the Columbia Metropolitan Airport, with a line bore under a major access road, and adjacent to runway airline flight patterns. The gravity sewer discharge, from three existing pump stations, was redirected into a regional force main that was installed over 10 years ago. Craig Kirby, Project Manager for American Engineering Consultants, said "recent sub-division growth in Cayce has stressed the gravity system and this project will alleviate some of that stress."

The City of Cayce is located less than five minutes from downtown Columbia, major interstates such as I-77 and I-26, the South Carolina Statehouse and the University of South Carolina. And for the NASCAR fans — a NASCAR hot spot through the 1970s, home to today's Tartan Day South. This historic spot is where Richard Petty won his first race!

WEST

Sales Region: West
Sales Representative: Carrie Stephens
Project Location: Ridgefield, WA
Project Owner/Utility: Clark Public Utilities, Vancouver, WA
Project Engineer: Murray, Smith & Associates
Project Contractor: Rotschy, Inc.
Project Distributor: Core & Main

Types of DIP used on the project:

Diameter	Joint	Class	Footage
24"	Tyton®	52	3,384
8"	Tyton®	52	344

PARADISE POINT PHASE 2

The Paradise Point Phase 2 project involves the installation of approximately 3,400 feet of 24" ductile iron pipe, all wrapped in V-Bio® Polyethylene Encasement, and McWane Sure Stop 350® gaskets being utilized in areas requiring restrained joints. Parallel to the waterline, a low-pressure backwash line is also being installed. This portion of waterline is just one component of what will be a total of 9,000 feet of raw waterline running from Paradise Point well field on the northwest side of the East Fork of the Lewis River to the treatment facility, where it will be filtered to eliminate small amounts of iron and manganese, then disinfected and chlorinated. From this point, it will be distributed to the north Clark County water system, facilitating current and future growth in the area.

Paradise Point Phase 2 project is funded by DWSR funds; therefore, all material on the project must be in compliance with American Iron and Steel requirements as mandated in EPA's State Revolving Fund programs.

McWane Ductile appreciates the opportunity to be a part of this important project, with special thanks to Core & Main.

TREATMENT PLANT

Sales Region: Treatment Plant
Sales Representative: Darcie Keirns
Project Location: Piqua, Ohio
Project Owner/Utility: City of Piqua
Project Engineer: CDM
Project Contractor: Peterson Construction
Project Distributor: N/A

Types of DIP used on the project:

Diameter	Joint	Class	Footage
36"	TR Flex®	250	990
30"	TR Flex®	250	648
8"	Tyton®	350	1,782
6"	Tyton®	350	2,142
4"	Tyton®	51	2,088

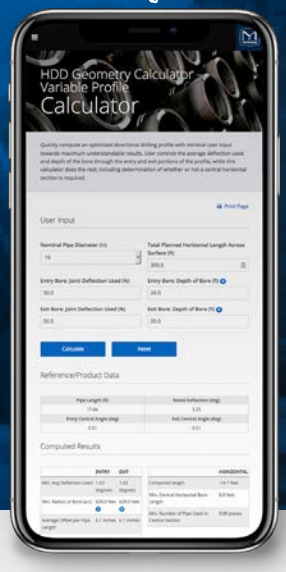
In 2017, the City of Piqua began a $42 million upgrade to their existing wastewater treatment facility. McWane Ductile was fortunate to be chosen as the DI pipe supplier by Peterson Construction on a significant portion of the work required. Along with the Tyton® and TR Flex® noted (above), there was also a significant quantity of fabricated material provided to Peterson as well.

One of the purposes of this upgrade was to address the mandate issued to Piqua by the Ohio EPA to eliminate storm sewer overflow (SSO) and the resulting runoff into the Great Miami River. The upgrade will increase the facility's treatment capacity from 8.67 MGD to 21.5 MGD. This upgrade follows previously performed upgrades the City drinking water processing. Now the discharge water from the plant will be clean as well and good for the river and the overall economic development of Piqua.

The new plant construction will continue with associated buildings and support structure through 2019, with final completion expected by May 2020.

SIMPLIFY YOUR JOB SITE.

When it comes to Horizontal Directional Drilling, nothing is easy. Or at least that's how it used to be. Today, HDD is as simple as the push of a button thanks to the **McWane Pocket Engineer™**. Designed to simplify the complex calculations needed to complete your drill-op, the Pocket Engineer compiles decades of field experience into one pocket-sized tool. Visit pe.mcwane.com or download the Pocket Engineer from the App Store or Google Play Store.



McWANE DUCTILE

CONNECT WITH US ON in

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

mcwaneductile.com

BUILDING IRON STRONG UTILITIES FOR GENERATIONS

Hello Ditch Doctor,

For a bunch of reasons I'd rather not get into, the pipeline project I just finishing installing is requested to be tested at 300 psi for two hours. With some of the elevation changes involved, to get 300 psi at the top of a few sections, the pressure at the lower end near the hydrotest pump will be near 400 psi during this testing. So, I ask you this: how much pressure is too much in the field?

Sincerely,
Feelin' It in Frisco

Cali ... Texas Ain't Got Hills Like That!

Dear Feelin' It,

Field or foundry, makes no difference. Three hundred psi is nowhere near the limit for ductile iron pipe (DIP). In fact, every single piece of DIP, all sizes and every wall class, are hydrotested in the standard manufacturing process to a minimum of 500 psi internal water pressure. And that's barely halfway to the worry mark, as all DIP barrels are likewise rated to 350 psi, which when including the DIP standard 100 psi surge allowance and a safety factor of 2.0 actually equates to 900 psi on a gauge. Truth be told, we have tested many diameters of class 52 DIP restrained joints to well over 1,000 psi with some smaller diameters nearing 2,000 psi of internal water pressure. Now while we did this in highly controlled and safety-conscious environments, nonetheless you can see that 300–400 psi should not be a threat to your installation. I couch it (as should be) because I'm operating under the presumption that any restraint considerations or thrust block designs were done with at least 400 psi as the guide. If the designer based the pipeline considerations on, let's say an original 150 psi post-installation test pressure, well, no, don't go to 400 psi ... for obvious reasons. Something is gonna separate somewhere. And “surprise” is the last word anyone wants to hear on a jobsite! I would suggest you check with the design engineer to confirm the proper design pressure was used. Or you can easily go to the McWane Pocket Engineer Thrust Restraint Calculator at pe.mcwane.com and compare the needs at 400 psi to what the plans show and/or what you actually installed. It's easy online!

Sincerely Not Sweating It,

The Ditch Doctor

Mr. Ditch Doctor,

How many service-connection taps can I put into the same piece of ductile iron pipe? Is there a minimum spacing I should keep between them, too?

Sincerely,
Tapped Out in Tulsa

Dear TOiT,

You might quite like to hear this: no true limit! Have at it! The practical answer is that the only guideline you need to follow are these simple two steps. One is based on experience and the other is plain common sense. 1. The combination of your selected tap size and the pipe wall involved should result to at least two full threads left in the wall by the tapping machine. Two full threads are long proven to contain 500 psi without leaking and resist more than 2 tons (4,000 lbs.) of pullout force on average. Typically, the copper pipe would separate from the brass corporation body before the threads would fail in the pipe wall (i.e., if copper or hdpe service line accidentally grabbed by a backhoe, etc.). 2. The spacing of side-by-side taps is controlled by the footing of the tapping machine you have. Clearly, you want to give yourself and others adequate room to work a wrench on the corp stop, no? Most people have seen the famous DIPRA photo where it looked more like an artificial tree trunk or old-school phone operators control board with so many outlets near each other around the entire circumference of the small diameter pipe. And none of them leaked when tested to 500 psi. You don't weaken DIP with multiple taps. It is beyond the resilience you need to connect a service line. Many service lines near each other is necessary. If it makes you feel better, you can stagger the tap locations along and around the barrel just to make it feel like you're not creating a "perforation" line. You know, like in your childhood paper notebooks. (I just lost everyone under 30 who is reading this ... perforations, what? Paper?). Nonetheless, tap away to either your heart's content or everyone in the neighborhood has clean running water! Ductile iron is here to serve. Reliable, and without limits or restrictions seen with other pipe materials! #SratchesAndDingsMeanNothingToDuctileIron #IronStrong

Sincerely,

Tap Master D
The Ditch Doctor

MIKE DODGE, VP SALES & MARKETING

EAST SALES TEAM

GENERAL SALES

Craig Spitzer, General Sales Manager
Office: 908-878-0822
craig.spitzer@mcwaneductile.com

Fran Tone, Inside Sales Manager
Office: 908-878-0823
fran.tone@mcwaneductile.com

Gary Kurtz, Assistant Sales Manager
Office: 908-878-0821
gary.kurtz@mcwaneductile.com

CONNECTICUT & MASSACHUSETTS

Jeff Houser, District Manager New England
Office: 518-275-1780
jeff.houser@mcwaneductile.com

VERMONT, NEW HAMPSHIRE, MAINE & RHODE ISLAND

Jim Guilbault, Sales Representative
Office: 802-578-7057
jim.guilbault@mcwaneductile.com

NEW YORK

Mike Palermo, District Manager New York
Office: 585-737-0456
mike.palermo@mcwaneductile.com

CENTRAL & EASTERN PENNSYLVANIA

Bob Hartzel, District Manager Mid Atlantic
Office: 717-571-5683
bob.hartzel@mcwaneductile.com

NEW JERSEY & DELAWARE

Amy Locha, Sales Representative
Cell: 908-319-0992
amy.locha@mcwaneductile.com

MARYLAND & WESTERN PENNSYLVANIA

Ben Leonard, Sales Representative
Cell: 908-442-5241
benjamin.leonard@mcwaneductile.com

NORTH CAROLINA

Dwayne Shelton, District Manager Piedmont
Office: 336-682-6187
dwayne.shelton@mcwaneductile.com

VIRGINIA

Todd Soady, Sales Representative
Office: 757-262-6174
todd.soady@mcwaneductile.com

CANADA SALES TEAM

GENERAL SALES

Greg Eisnor, General Sales Manager
Office: 902-444-7350
Cell: 902-449-2685
greg.eisnor@canadapipe.com

Martine Bernier, Technical Services Engineer
Cell: 819-740-7453
martine.bernier@canadapipe.com

Crystal Issacs, Manager, Sales Office
Office: 905-547-3251
crystal.issacs@canadapipe.com

Martin Phinney, National Sales Engineer
Office: 506-961-9229
martin.phinney@canadapipe.com

ATLANTIC

Steve Philpott, Sales Representative
Office: 709-722-4814
Cell: 709-728-8760
steve.philpott@canadapipe.com

QUEBEC

Marc Giguere, Sales Manager
Cell: 819-740-4242
marc.giguere@canadapipe.com

Michel Metivier, Sales Representative
Eastern Quebec
Office: 418-843-3566
Cell: 418-802-4594
michel.metivier@canadapipe.com

ONTARIO

Paul Stringer, Sales Manager
Office: 705-799-7667
Cell: 705-750-5686
paul.stringer@canadapipe.com

Ron Siddique, Sales Representative
Cell: 289-244-8714
ron.siddique@canadapipe.com

WESTERN CANADA

Scott Bell, Sales Representative
Cell: 604-499-3825
scott.bell@canadapipe.com

Brent Williamson, Sales Representative
Office: 604-737-1279
Cell: 604-360-0960
brent.williamson@canadapipe.com

MIDWEST SALES TEAM

GENERAL SALES

Scott Frank, General Sales Manager
Office: 740-622-6651
Cell: 740-202-3094
scott.frank@mcwaneductile.com

Geoff Guss, Assistant Sales Manager
Office: 740-291-1053
Cell: 614-558-2908
geoff.guss@mcwaneductile.com

Dave Bursh, Inside Sales Manager
Office: 740-291-1064
dave.bursh@mcwaneductile.com

ILLINOIS

Dan Flaig, District Manager
Cell: 815-353-4607
dan.flaig@mcwaneductile.com

SOUTHERN ILLINOIS

Clinton (CJ) Fowler, Sales Representative
Cell: 330-260-9292
clinton.fowler@mcwaneductile.com

KENTUCKY, SOUTHERN INDIANA & SOUTHWESTERN OHIO

Jon Melloan, Sales Representative
Office: 502-859-2950
Cell: 502-472-6647
jon.melloan@mcwaneductile.com

SOUTHERN MICHIGAN, NORTHERN INDIANA & NORTHWESTERN OHIO

Kevin Christian, Sales Representative
Cell: 734-223-5632
kevin.christian@mcwaneductile.com

MISSOURI, WESTERN IOWA, KANSAS, NEBRASKA & SOUTH DAKOTA

Robin Hazlett, Sales Representative
Office: 816-873-3411
Cell: 816-898-0516
robin.hazlett@mcwaneductile.com

NORTHEASTERN OHIO & NORTHERN WEST VIRGINIA

Kevin Ratcliffe, District Manager
Office: 740-291-1012
Cell: 740-202-0004
kevin.ratcliffe@mcwaneductile.com

CENTRAL & SOUTHEASTERN OHIO & SOUTHERN WEST VIRGINIA

Phil Ames, Sales Representative
Cell: 614-325-6865
phil.ames@mcwaneductile.com

WISCONSIN, MINNESOTA, NORTH DAKOTA & NORTHERN MICHIGAN

Chris Mirwald, Sales Representative
Cell: 920-227-8616
chris.mirwald@mcwaneductile.com

TREATMENT PLANT SALES

GENERAL TREATMENT PLANT SALES

David Smith, General Sales Manager
Cell: 724-316-4093
david.smith@mcwaneductile.com

Cory Humphreys, Technical Services Manager
Office: 740-291-1046
cory.humphreys@mcwaneductile.com

NORTHERN OHIO, WESTERN PENNSYLVANIA, MICHIGAN, WESTERN NEW YORK

Matt Drummond, Sales Representative
Cell: 614-917-3821
matt.drummond@mcwaneductile.com

SOUTHERN OHIO, KENTUCKY, INDIANA, & WEST VIRGINIA

Darcie Keirns, Sales Representative
Cell: 740-607-9082
darcie.keirns@mcwaneductile.com

IOWA, MISSOURI, KANSAS, COLORADO, NEBRASKA, N. DAKOTA, S. DAKOTA & MINNESOTA

Dan Henrie, Sales Manager
Cell: 630-604-7489
dan.henrie@mcwaneductile.com

DELAWARE, MARYLAND, VIRGINIA, WASHINGTON, D.C., EASTERN PENNSYLVANIA & TENNESSEE

Alex Shelton, Sales Representative
Cell: 740-572-2903
alex.shelton@mcwaneductile.com

SOUTH SALES TEAM

GENERAL SALES

Terry Lynch, General Sales Manager
Office: 615-305-0768
terry.lynch@mcwaneductile.com

ALABAMA, GEORGIA, SOUTH CAROLINA, FLORIDA, LOUISIANA & MISSISSIPPI

Jeremy Gwin, Regional Sales Manager
Office: 205-541-4090
jeremy.gwin@mcwaneductile.com

TENNESSEE, ARKANSAS, TEXAS & OKLAHOMA

Dusty Henderson, Regional Sales Manager
Office: 615-418-0741
dustin.henderson@mcwaneductile.com

ARKANSAS, OKLAHOMA & NORTH TEXAS

Steve Waryas, Sales Representative
Office: 918-938-2379
steven.waryas@mcwaneductile.com

FLORIDA (Except Panhandle)

Gary Gula, Sales Representative
Office: 239-989-6298
gary.gula@mcwaneductile.com

ALABAMA, LOUISIANA, FLORIDA (Panhandle only) & TENNESSEE (Memphis only)

Doug Clark, Sales Representative
Office: 662-341-0205
doug.clark@mcwaneductile.com

SOUTH CAROLINA & EASTERN GEORGIA

Eddie Lowe, Sales Representative
Office: 478-258-5458
eddie.lowe@mcwaneductile.com

TENNESSEE (Except Memphis)

Jim Yancey, Sales Representative
Cell: 423-260-2471
jim.yancey@mcwaneductile.com

TEXAS (Except El Paso)

Scott Rhorick, Sales Representative
Office: 254-317-8455
scott.rhorick@mcwaneductile.com

WESTERN GEORGIA

Brian Richard, Sales Representative
Office: 803-600-3323
brian.richard@mcwaneductile.com

WEST SALES TEAM

GENERAL SALES

Nick Koncar, General Sales Manager
Office: 801-623-4256
Cell: 801-864-5544
nick.koncar@mcwaneductile.com

Kim Christensen, Inside Sales Manager
Office: 801-623-4254
kim.christensen@mcwaneductile.com

ARIZONA, NEW MEXICO & TEXAS (El Paso only)

Wes Cassiere, Regional Sales Manager — Southwest
Cell: 480-280-5424
wes.cassiere@mcwaneductile.com

SOUTHERN CALIFORNIA

Carolyn Lopez, District Manager
Office: 951-371-1440
Cell: 951-310-6444
carolyn.lopez@mcwaneductile.com

SOUTHERN CALIFORNIA & SOUTHERN NEVADA

David Bridge, Sales Representative
Cell: 951-520-6416
david.bridge@mcwaneductile.com

UTAH & COLORADO

Aaron Loosli, Sales Representative
Cell: 385-208-7352
aaron.loosli@mcwaneductile.com

WEST WASHINGTON & ALASKA

Jason Harrison, Regional Sales Manager — Northwest
Cell: 425-681-1394
jason.harrison@mcwaneductile.com

Daniel Sullivan, Sales Representative
Cell: 206-503-3900
daniel.sullivan@mcwaneductile.com

OREGON

Carrie Stephens, Sales Representative
Cell: 503-577-4177
carrie.stephens@mcwaneductile.com

WASHINGTON, IDAHO, WYOMING, MONTANA & HAWAII

Jason Barnes, Sales Representative
Cell: 206-714-8213
jason.barnes@mcwaneductile.com

NORTHERN CALIFORNIA & NORTHERN NEVADA

Christine Michaelidis, Sales Representative
Cell: 916-205-0906
christine.michealidis@mcwaneductile.com

SALES OPERATIONS

Stuart Liddell, Sales Operations Manager
Office: 352-208-5709
stuart.liddell@mcwaneductile.com

Jeff Henderson, National Account Manager
Cell: 614-404-4909
jeff.henderson@mcwaneductile.com

Jerry Regula, National Product Engineer
Office: 740-291-1068
jerry.regula@mcwaneductile.com

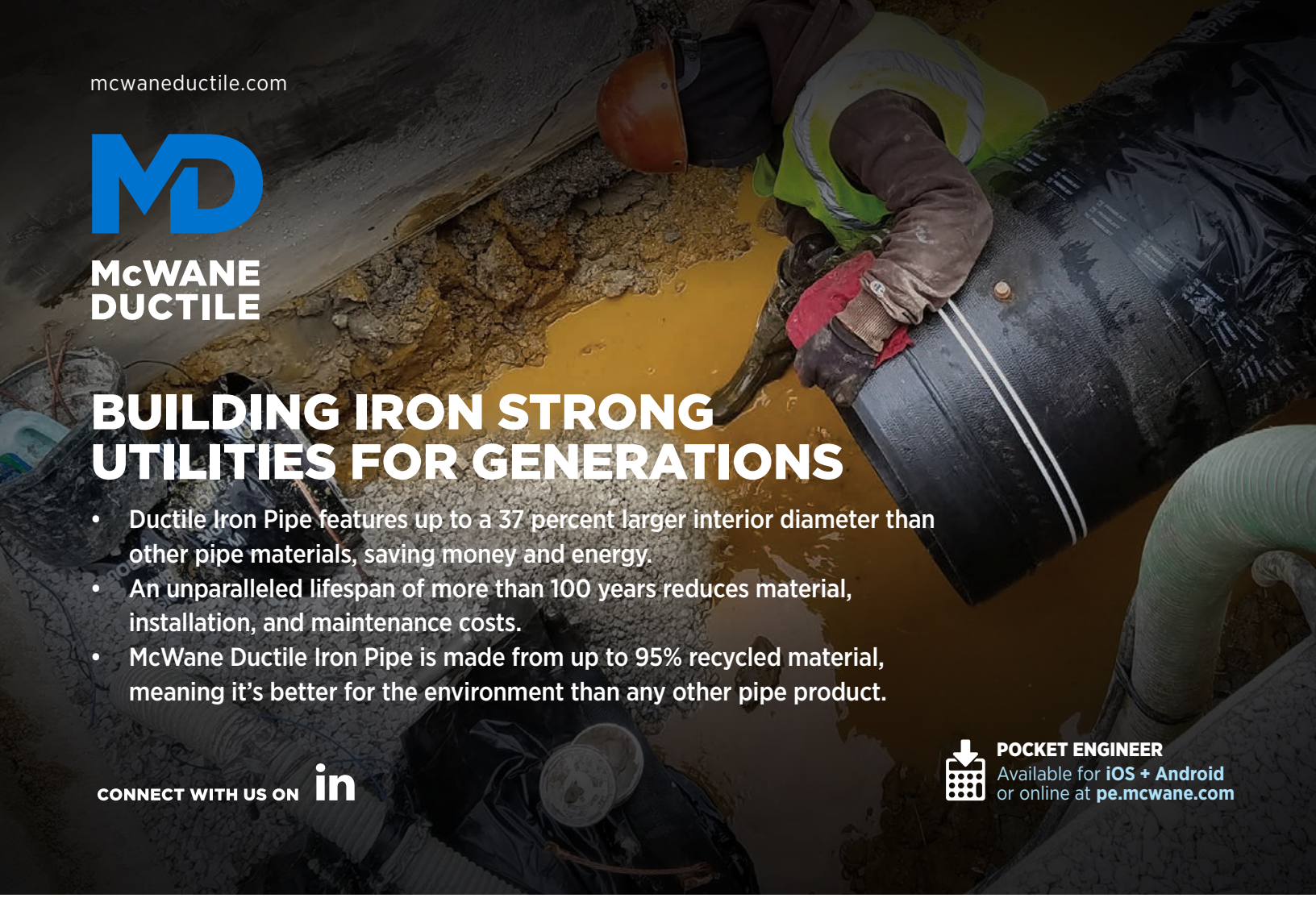
Ken Rickvalsky, National Product Engineer
Office: 609-290-7701
ken.rickvalsky@mcwaneductile.com

Roy Mundy, Regional Engineer
Cell: 859-361-8585
Fax: 859-273-4799
roy.mundy@mcwaneductile.com

John Johnson, Regional Engineer
Cell: 951-813-9589
john.johnson@mcwaneductile.com

John Simpson, Regional Engineer
Cell: 865-256-2541
john.simpson@mcwaneductile.com

Brittleigh Unger, Marketing Specialist
Office: 740-202-7352
brittleigh.unger@mcwaneductile.com



MODERNMCWANE

McWANE DUCTILE
MCWANE DUCTILE
1201 Vanderbilt Road
Birmingham, AL 35234

[FIRST NAME] [LAST NAME]
[ADDRESS1]
[ADDRESS2]
[CITY], [STATE] [ZIP]