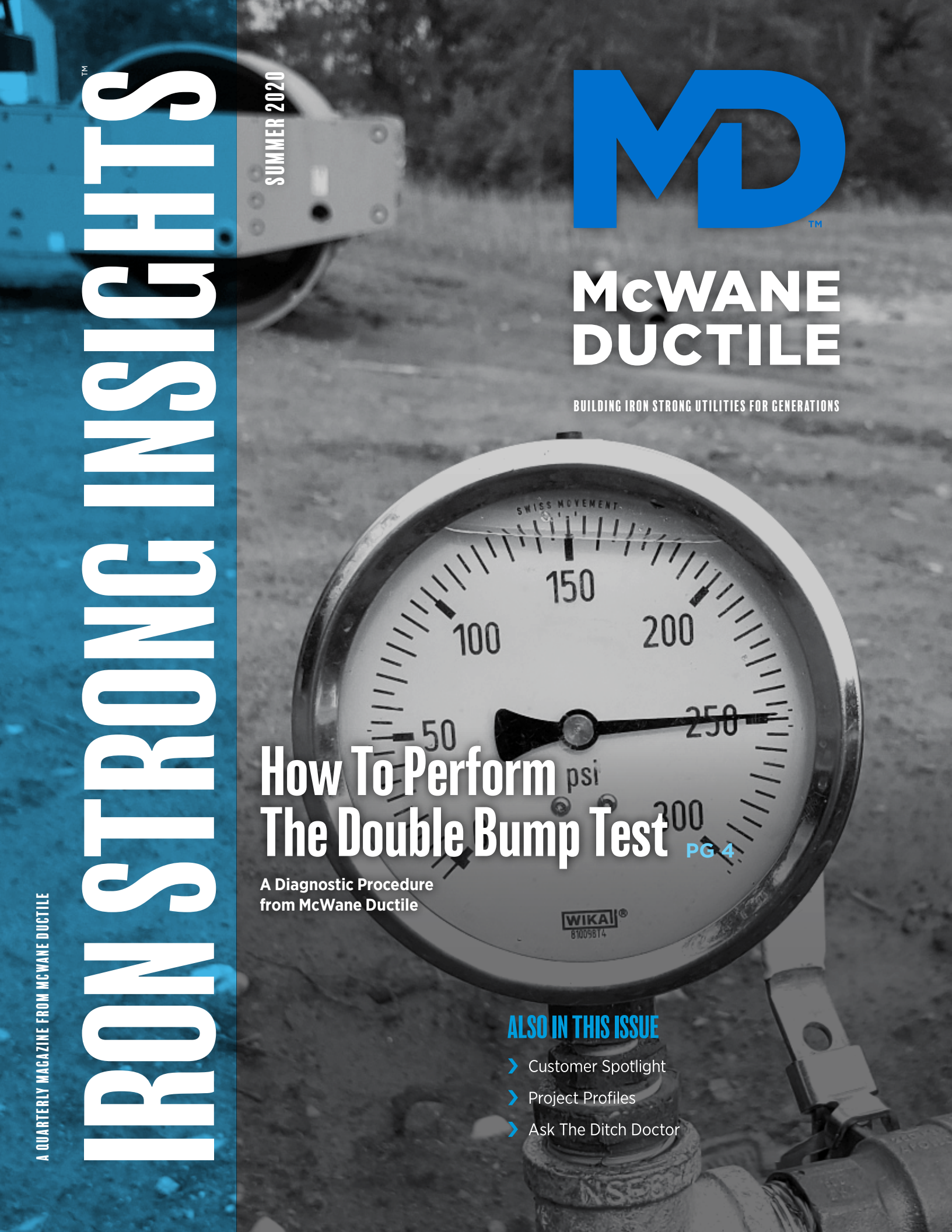
IRON STRONG INSIGHTS™

SUMMER 2020

A QUARTERLY MAGAZINE FROM MCWANE DUCTILE

McWANE DUCTILE™

BUILDING IRON STRONG UTILITIES FOR GENERATIONS



How To Perform The Double Bump Test

PG 4

A Diagnostic Procedure from McWane Ductile

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McWANE DUCTILE

Contact Us: McWaneDuctile.com

Mike Dodge, VP Sales & Marketing
Stuart Liddell, Sales Operations Manager
Andrea Kubik, Marketing Manager

Inside

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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How To Perform The Double Bump Test

PG 4 **A Diagnostic Procedure from McWane Ductile**

IN THIS ISSUE

Welcome to Iron Strong Insights™

Dear Readers,

Welcome to the Summer edition of Iron Strong Insights. This is our second edition under the new name and format, and we are excited to see it continue to evolve. We have received good feedback on this new look, which is appreciated. We hope to continue to add new content and features that excite and inform our readers.

In this issue, we have a feature article written by National Product Engineer Ken Rickvalsky that details the McWane Double Bump Test (DBT) — a diagnostic procedure designed to assist contractors that are experiencing issues in performing a successful hydrostatic pressure test. The primary goal of the DBT is to determine if the problem is related to trapped air in the line(s) or if there is an actual leak in the pipeline. Again, we have Ditch Doctor content for our readers to enjoy. The two entries in this edition focus on the installation and recommended uses of Sure Stop 350® gaskets. As always, the Doctor injects some humor into real scenarios and questions encountered by our staff and customers in the field.

The Project Profile section has some interesting construction jobs from across the United States. The Northeast profile focuses on a waterline replacement project at the Pimlico Racecourse in Maryland. The South profile details a small but significant installation in the Palm Beach area of Florida. Both projects emphasize the durability and adaptability that Ductile iron pipe can provide.

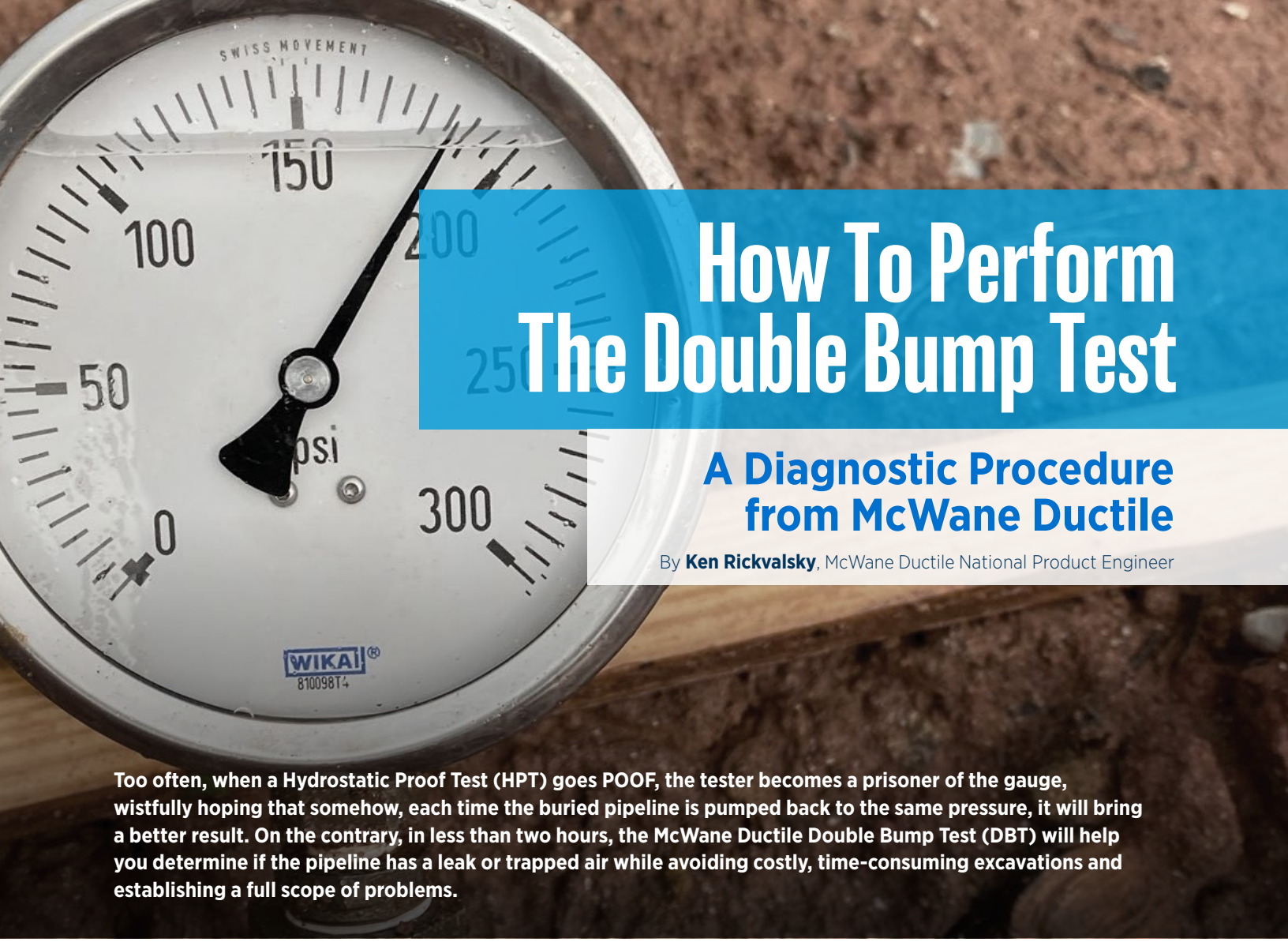
Please check out another new and unique Pipeline Puzzle. The puzzle in this edition is a "Spot the Difference" photo challenge and features two "mirror" pictures of a casting machine operator at work. There are 13 differences between the two images, and some are difficult to see. Do not worry, the puzzle key is included should you become stumped.

The last several months have been quite a challenge as our society has dealt with the COVID-19 pandemic. As noted in the previous issue, many traditional events we typically engage in, such as trade shows and conferences, have been canceled. We've all been required to adapt to a new way of conducting business, which includes virtual meetings. McWane Ductile is ready to assist our customers in any way we can. Since March, we have conducted numerous training webinars for a variety of customers, each tailored to fit their specific needs. If you or your company are interested in these training opportunities, please reach out to your local representative for details.

Finally, as we move further into summer, the reality that this crisis will be with us for a while longer has become evident. The prospect of life returning to normal has been pushed further than many of us expected. But soon enough, things will improve, and McWane Ductile will be here to assist in Building Iron Strong Utilities for Generations.

Stuart Liddell
Sales Operations Manager
Sales Operations Department

7/9/20



How To Perform The Double Bump Test

A Diagnostic Procedure from McWane Ductile

By **Ken Rickvalsky**, McWane Ductile National Product Engineer

Too often, when a Hydrostatic Proof Test (HPT) goes POOF, the tester becomes a prisoner of the gauge, wistfully hoping that somehow, each time the buried pipeline is pumped back to the same pressure, it will bring a better result. On the contrary, in less than two hours, the McWane Ductile Double Bump Test (DBT) will help you determine if the pipeline has a leak or trapped air while avoiding costly, time-consuming excavations and establishing a full scope of problems.

FOUNDATION OF THE DOUBLE BUMP TEST

The DBT was developed over two decades from hands-on experience. When a pressure drop is confused for water loss, contractors often start a costly hunt, digging for a nonexistent leak. Trapped air is the leading cause of a false-negative HPT result. Many will experience that. When the pump is on, air pockets compress and pressure rises on the gauge. When the pump is off, the pockets expand, showing a pressure loss on the gauge — often more than 20 or 30 psi, depending on the pipeline size and layout.

A DBT helps you determine if the pipeline is leaking without digging exploratory holes. Compare the recovery volumes across three separate 30-minute pressure tests, increasing the pressure for each test to ascertain if the pipeline contains trapped air or is losing water.

MUST ASK QUESTIONS BEFORE BUMPING

1. Is the entire pipeline segment to be tested constructed of Ductile iron pipe (DI pipe)? Pressures greater than 200 psi can damage some alternate piping materials.

2. How much of what size pipe is involved in the segment being tested? The length and size of the segment being tested contribute to assessments made from the DBT data.

3. What is the highest pressure the pipeline segment of concern has been pumped to? If the pipeline, for example, cannot be pumped to or above 200 psi, it's an indication of a significant anomaly, such as a displaced gasket or other substantial damage, such as a split, crack or impact wound through the pipe wall.

4. Does the pipeline segment being tested fall to 0 psi? If so, there is a substantial active leak, and the rate of water loss at 200 psi should be taken as the volume to chase.

5. Does the pipeline segment being tested fall below any adjacent static pressure but not to 0 psi? If so, this indicates the segment being tested is

hydraulically isolated; otherwise, the segment pressure would equalize to the adjacent static pressure. Use the DBT to analyze.

6. Are there restrained joints in the pipeline segment being tested? Unrestrained rubber-gasket pipe joints are prone to separate at elevated internal pressures, which creates thrust forces in excess of their buried condition.

7. What design pressure was used for the restrained joints in the pipeline section being tested? It is not recommended to exceed the ultimate design pressure (SF*Pd) used to establish the amounts and locations of restrained joints within a pipeline. The Thrust Restraint Calculator in the McWane Pocket Engineer applies a default safety factor (SF) of 1.5 to the input design pressure (psi). Users can enter any SF of their choice.

A DBT helps you determine if the pipeline is leaking without digging exploratory holes. Compare the recovery volumes across three separate 30-minute pressure tests, increasing the pressure for each test to ascertain if the pipeline contains trapped air or is losing water.

PERFORMING THE DOUBLE BUMP TEST

The preferred hydrotest pressures for the DBT procedure are 200, 250 and 300 psi for 30 minutes each. Each DI pipe or fitting has been factory tested to a minimum of 500 psi per AWWA standards, and brass/copper service connections to DI pipe have been shown to handle 500 psi easily through DIPRA testing. AWWA conformant gate valves and/or wedge-action retainer glands also perform well against 500 psi.

1. Clean and fill a known-volume container to gauge the recovery volume following each pressure bump in the DBT. Examples are a 5-gallon bucket (volume = 0.40 gal/in of water depth), a 33-gallon garbage can (1.25 gal/in), a 55-gallon drum (1.70 gal/in) or the rectangular 20-gallon plastic tank atop some hydrostatic test pumps (1.80 gal/in).

2. Pressurize the pipeline to the starting pressure of the DBT, preferably 200 psi, with the pump intake drawing water from the known-volume container, refilling the container at the same time from another water source as needed. When the desired pressure is attained, start a timer.

3. Fill the known-volume container during this 30-minute wait and record the starting water depth in the container. *(See DATA recording chart on page 6).*

4. At the 30 minute mark, pump the pipeline back to 200 psi from the known-volume-container and record the water depth in the container after de-pressurization. The recovery volume is the difference between the starting and after water depths (inches) within the container.

5. Bump the pressure in the pipeline to 250 psi, drawing from the known-volume container, refilling the container at the same time from another water source as needed.

6. Repeat Steps 3 and 4 at this elevated pressure (250 psi).

7. Repeat Step 5 bumping the pressure to 300 psi. Repeat Steps 3 and 4 once again at this pressure.

ANALYSIS OF DOUBLE BUMP TEST RESULTS

If the recovery volume remains the same or decreases across these three pressure tests, you do NOT have a leak. The pressure loss seen on the gauge is a result of air pockets trapped in the varying geometry of the pipeline. Remember, air is compressible but water is not. Some air pockets might only be removed by in-service high-velocity dynamic water flow, if ever. There is no further investigation needed on this pipeline segment.

DOUBLE BUMP TEST — DIAGNOSTIC DATA
Segment Description: 1,300 ft of 12 in DI pipe — 55 gal drum

Starting Pressure (psi)	Starting Water Depth (inches)	Trial Duration (min)	Water Depth After Re-Pressure (inches)	Recovery Volume (inches consumed)	Recovery Volume (gallons)
200	25.5	30	23.0	2.5	4.3
250	21.0	30	18.5	2.5	4.3
300	24.0	30	21.8	2.2	3.7

GOOD RESULT — Trapped air the size of 2 basketballs

If the recovery volume increases across these three pressure tests, there is an active leak requiring further investigation, often aided by a leak detection specialist. The 200 psi recovery volume in gallons divided by 30 is the total volume per minute that must be found. The best practice is to find all the leaking volume before effecting any repairs to the pipeline. In this example, that is 33 ounces per minute at 200 psi.

DOUBLE BUMP TEST — DIAGNOSTIC DATA
Segment Description: 1,300 ft of 12 in DI pipe — 55 gal drum

Starting Pressure (psi)	Starting Water Depth (inches)	Trial Duration (min)	Water Depth After Re-Pressure (inches)	Recovery Volume (inches consumed)	Recovery Volume (gallons)
200	26.0	30	21.5	4.5	7.7
250	25.0	30	18.5	6.5	11.0
300	24.0	30	11.0	13.0	22.1

BAD RESULT — Leaks = 33oz/min at 200 psi

EVEN THE BAD CAN BE GOOD

Nobody ever wants to experience leaks on a pipeline. However, when leaks come your way, random excavations can waste serious time and money. The McWane Ductile Double Bump Test can make the best of a bad situation, with less frustration and a faster resolution.

Now that you have a better understanding of the DBT procedure, be sure to download our handy tip sheet with instructions and a diagnostic data chart by visiting **mcwaneductile.com/learning-center/product-literature/**.

ABOUT THE AUTHOR

Ken Rickvalsky

National Product Engineer Ken Rickvalsky has spent three decades serving the water and sewer industry. He spent 14 years with Griffin Pipe Products before joining McWane Ductile, where he has spent the past 15 years managing utility design, manufacturing and construction, problem solving and more throughout North America.

CONSUMERS ARE REPLACING PLASTIC STRAWS. ARE YOU?

Consumers are taking action. Plastic straws are out. And just like a giant plastic drinking straw, discarded PVC takes about 400 years to break down, polluting our earth and creating problems well into the future. Unlike plastic, McWane Ductile iron pipe is made from up to 95 percent clean recycled iron and steel, cast in fire to stay strong and perform underground for 100 years — at which point it can be recycled and reused over and over again.

That's why McWane Ductile is **Building Iron Strong Utilities for Generations.**

McWANE DUCTILE

McWaneDuctile.com

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

CUSTOMER SPOTLIGHT

Although we love highlighting major projects, sometimes it is solving a utility's problem that is the most enjoyable and satisfying. Our valued partners at Northwest Arkansas Winwater called us on April 27, 2020, with a customer in need — Benton Washington Regional Public Water Authority (BWRPWA).

BWRPWA had a leak on a 36-inch main that serviced a significant portion of northwest Arkansas. BWRPWA had contacted Seven Valleys Concrete to fix their leak, who reached out to our partners at Northwest Arkansas Winwater to help them arrange for the materials they needed to get BWRPWA back up and running. That was when Northwest Arkansas Winwater and McWane Ductile went to work. Winwater called us on Monday to find out if we had a piece of Gauged Full Length 36-inch Ductile iron pipe that Seven Valleys could use to make the repair. We had the pipe on the ground in Ohio and needed to find a carrier who could get the pipe to them as fast as possible. With the help of McWane Truck Brokerage, we lined up a carrier that got the pipe to Northwest Arkansas Winwater on Wednesday. With all the material on site, Seven Valleys was able to go to work fixing BWRPWA's issue that Thursday, April 30.

Seven Valleys had to do the following to fix the leak:

- Uncovering and cutting out a 36-inch MJ Cross
- Hammering vast amounts of concrete thrust blocks
- Cutting the new 36-inch Ductile iron pipe
- Adding long sleeves that Winwater purchased from our sister company Tyler Union
- Sleeving the line back into service

Large, major scale projects are great, but fixing a utility's issue like this is what we are in business to do and why are considered essential. Thank you to Northwest Arkansas Winwater (Stephen, Joey and the rest of your team) for trusting us with your Ductile iron pipe needs. Thanks to Seven Valleys Concrete and Benton Washington Regional Public Water Authority for allowing Northwest Arkansas Winwater and McWane Ductile to help solve your problem.

Sales Region: South
Sales Representative: Dusty Henderson
Project Location: Rogers, AR
Project Owner/Utility: Benton Washington Regional Public Water Authority
Project Distributor: Northwest Arkansas Winwater

Types of Ductile iron pipe used on the project:

DIAMETER	JOINT	CLASS	FOOTAGE
36"	Tyton®	200	18

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,

Between fighting the snakes and rain, we are attempting to finish this job. I noticed the other day that my operator, Judd, appears to be using more force to push/home pipe when we are using Sure Stop® restraint gaskets. Judd says he could use less force if he wiggles the pipe as he is pushing home. Wiggles, giggles and snakes — I just want to get the work done! What do you think?

Roger from Rawlins

DEAR ROGER,

Not certain I can help you with the giggles and snakes, and I hope the fight with snakes is in the figurative sense. As for the wiggle, I can actually help with that, and I'm not talking about my dance moves from the '80s. I was the bomb diggity dance machine! Back to the wiggle. Straight is great, man. No "wiggling" permitted. And yes, it does take more energy to home a joint when restraint gaskets are used compared to a standard gasket. Let's do the math. The restraint gasket contains metal as well as the rubber.

I'll give you an example: Some operators use a spud bar to home 6-inch and 8-inch pipe when using standard gaskets. Not many operators, if any, can home an 8-inch restraint gasket joint using a spud bar. Kind of doubt Judd would use a spud. Last thing, white gloves and taking it easy may be a requirement when installing PVC pipe to prevent over belling. No worries here with Ductile iron. Shove that pipe home and get the job done.

Good luck and stay safe,
Ditch Doctor

DEAR DITCH DOCTOR,

My little brother, Ron, will be installing a Horizontal Directional Drill section of a project. He says the spec calls for TR Flex® pipe, but he is about 400 feet short. Ron thinks he can use Sure Stop® gaskets for the remaining 400 feet, but I'm not so sure. Should I be concerned for my little bro?

Rick from Riner

DEAR RICK,

Well, Rick, good to hear you are looking out for your little brother. Sounds like Ron is heading down the road of despair. First, there is typically a good reason why a specification is written. Every job is different, and what works in one situation may not be a wise choice for a different application. It would be a bad day if Ron had to redo the HDD portion of the project after choosing to use something other than specified. Second, Sure Stop® gaskets are an excellent form of restraint. However, they are not recommended for HDD applications. Stick to the plan, man!

Thanks for watching out for your bro,
Ditch Doctor

PROJECT PROFILES

West

PROJECT PROFILE

The Boise, Idaho, area has been growing at a rapid pace. To keep up with demand for commercial and residential water, Suez has been upgrading and installing new water mains.

To accomplish this, they partnered with Knife River Construction and McWane Ductile in 2019 for a multi-phased project called Redwood Creek.

The pipe was installed over 11 months in 2019 and 2020, which consisted of 20,000 feet of Ductile iron pipe in size 16-inch thru 24-inch Tyton® Joint pipe with Sure Stop® Restraints and V-Bio® Polyethylene Encasement (V-Bio). Knife River encountered almost every type of circumstance on this project that a contractor can, including connecting to bores, installing on main roads and passing through residential subdivisions.

During February, Jason Barnes and Jason Harrison, McWane Ductile Sales Representatives, visited the site to meet the team. They provided a refresher class on proper installation when using Ductile iron with Sure Stop gaskets and V-Bio.

Sales Region: West
Sales Representative: Jason Barnes
Project Location: Boise, ID
Project Owner/Utility: Suez (Private Water Company)
Project Engineer: JUB
Project Contractor: Knife River
Project Distributor: Direct Buy – Suez

Types of Ductile iron pipe used on the project:

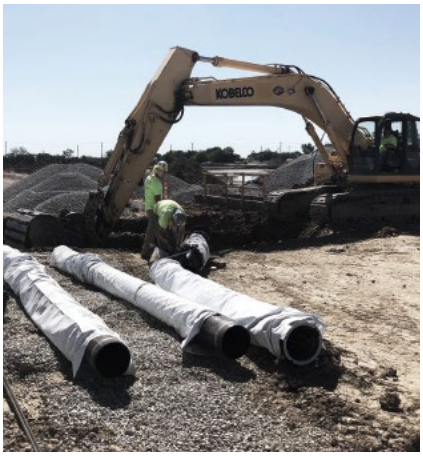
DIAMETER	JOINT	CLASS	FOOTAGE
6″	Tyton®	52	434
8″	Tyton®	52	616
12″	Tyton®	52	3,381
16″	Tyton®	52	6,010
20″	Tyton®	52	16,183
24″	Tyton®	52	16,129

PROJECT PROFILE

Midwest

This project is to construct a new Harbor Freight Midwestern distribution center in Joliet, Illinois. According to a document submitted to the City of Joliet Economic Development Committee, they approved a property tax abatement with Harbor Freight Tools Texas. Before selecting Illinois, Harbor Freight considered several locations to build a new Midwestern distribution center, including sites in Pennsylvania, Ohio, Texas, Wisconsin and Illinois. This project is located on a 140-acre parcel at CenterPoint Intermodal Center. Once completed, this distribution center will be the largest building in Will County, with more than 1.6 million square feet.

MVP Plumbing is the contractor providing the underground utilities installation for this project. The project includes over 11,000 feet of 10-inch McWane Ductile iron pipe Class 52 Tyton® Joint zinc coated, which was sold by Underground Pipe & Valve from Shorewood, Illinois. This pipe is being installed as a fire line for this massive building structure.



MVP Plumbing Corp. started in 1997 with one employee. Through continued partnerships with many general contractors, the company has expanded to a team of over 100 of the most skilled field and office personnel in the industry.

"We are solutions oriented and find creative ways to problem solve. We appreciate the partnership with Tom Butler and Underground Pipe & Valve along with McWane Ductile."

— Matt Weisz, Owner of MVP Plumbing

Sales Region: Midwest
Sales Representative: Dan Flaig
Project Location: Joliet, IL
Project Owner/Utility: Harbor Freight — Midwest Distribution Center
Project Engineer: Jacob & Hefner Associates
Project Contractor: MVP Plumbing
Project Distributor: Underground Pipe & Valve

Types of Ductile iron pipe used on the project:

DIAMETER	JOINT	CLASS	FOOTAGE
6″	Tyton®	52	350
10″	Tyton®	52	11,500

South

PROJECT PROFILE

Our local distributor in southeast Florida (A&B Pipe & Supply — Miami, FL) recently supplied a 30-inch Ductile iron project to their customer American Pipeline Construction, also out of Miami. On paper, the project was relatively small, which included approximately 200 linear feet of 30-inch TR Flex® pipe with Protecto 401™ lining for the sewage pipe relocation and roughly the same footage of 16-inch Tyton® Joint pipe (with cement lining) for the watermain portion of the project. Both sizes also had some additional footage of flanged pipe to be mounted on a bridge deck to cross a canal.

Although the project was small in terms of lineal footage, this installation project was more complicated than what you might think.

It was located at the intersection of State Route 80 and Lyons Boulevard in the West Palm Beach area. American Pipeline Construction, Inc. would encounter many of the variables typically seen in south Florida utility projects within the first couple hundred feet.

These variables included:

- A difficult connection to the existing line
- Removing the existing PVC sewer line and replacing it with Ductile iron pipe
- Constructing a wider bridge and turning lane
- Mounting pipe on the bridge to cross a canal
- Directing traffic at a heavily traveled intersection
- Multiple fittings and cuts of the new pipeline
- Relocating the pipe outside of a new lane of traffic

Both the contractor and Palm Beach County representatives were very appreciative of our involvement on site to ensure the installation process went as smoothly as possible.

Sales Region: South
Sales Representative: Gary Gula
Project Location: West Palm Beach, FL
Project Owner/Utility: Florida Department of Transportation (FDOT)
Project Engineer: Stanley Consultants, Inc.
Project Contractor: American Pipeline Construction, Inc.
Project Distributor: A&B Pipe & Supply, Inc.

Types of Ductile iron pipe used on the project:

DIAMETER	JOINT	CLASS	FOOTAGE
30″	TR Flex®	200	198
16″	Tyton®	50	162

Sales Region: Northeast
Sales Representative: Benjamin Leonard
Project Location: Baltimore, MD
Project Owner/Utility: The Stronach Group
Project Engineer: The Wilson T Ballard Co Consulting Engineers
Project Contractor: SEH Excavation

Types of Ductile iron pipe used on the project:

DIAMETER	JOINT	CLASS	FOOTAGE
12″	Tyton®	54	1980
8″	Tyton®	54	900
6″	Tyton®	54	780
4″	Tyton®	54	90

The Pimlico Race Course, home of the Preakness Stakes, first opened its doors on October 25, 1870, making it the second oldest racetrack in the nation. The oval racetrack can hold over 120,000 spectators. In addition to horse racing, the track hosts several music events such as the Virgin Mobile Festival and Moonrise.

On May 17, 2018, just four days before the track was to host the annual Preakness Stakes, a water main broke in front of the complex.

The facility had a similar water main failure just two years earlier. While the water main break was temporarily fixed to continue with the season, it was clear that the site's infrastructure needed to be re-evaluated and replaced.

Wilson T. Ballard Company engineering consultants assisted in researching and planning the replacement of critical areas of waterline on the site. SEH Excavating, led by Bob Cook, was able to replace more than 3,000 feet of Ductile iron pipeline, the majority of it being 12-inch. The waterline that was replaced started at the main entrance and traveled along the entire outside perimeter of the grandstand, ensuring proper water pressure and volume for the upcoming season. By using Ductile iron, the engineer and contractors were able to quickly install the pipe with the natural soil already on site, thus keeping costs down.

While more areas of infrastructure need to be improved upon, the crucial waterline that feeds the grand concourse has been replaced and tested and should last well over another 100 years to support the Baltimore, Maryland, sporting landmark.

PROJECT PROFILE

Northeast

PIPELINE PUZZLE

SPOT • THE DIFFERENCE

THERE ARE 13 DIFFERENCES BETWEEN THESE TWO PICTURES BELOW. CAN YOU SPOT THEM?

REFER TO PAGE 15 TO SEE THE 13 DIFFERENCES IN THESE TWO PICTURES.

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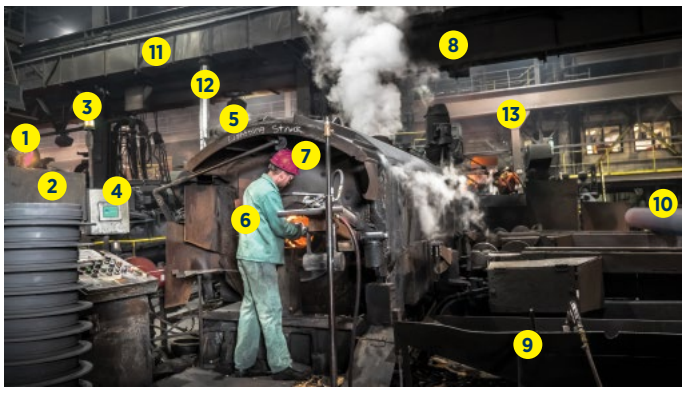

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