SUMMER 2019

MODERN MCWANE

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McWane Ductile

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INSIDE

MD | IRON STRONG

WELCOME TO MODERN McWANE

Dear Readers,

Welcome to the Summer 2019 issue of Modern McWane. Having already celebrated the Fourth of July holiday, it appears summer has almost passed us already. But there are plenty of hot days ahead and, hopefully for everyone, some time to relax and enjoy the outdoors with family and friends.

In this issue, we look back at the AWWA ACE '19 conference in Denver where McWane unveiled a new exhibit booth. The new design provided more interactive space than in the past and allowed for a good bit of visitor traffic. For those who stopped by, we appreciate you taking some time to visit with McWane. If perchance we missed you at ACE, there are still plenty of conferences ahead of us in 2019. The back cover of this issue contains information on upcoming conferences where our staff will present on various topics of interest to the water and wastewater industry.

As always, we have our Project Profile section filled with various entries from across the U.S. Of interest in this issue is the Treatment Plant submission for a Combined Sewer Overflow basin constructed for the Louisville Metropolitan Sewer District. The construction was performed by Ulliman Schutte Construction, and our videographer has posted a unique video with aerial footage to McWane Ductile's social media pages and YouTube channel. If you haven't seen it already, please check it out.

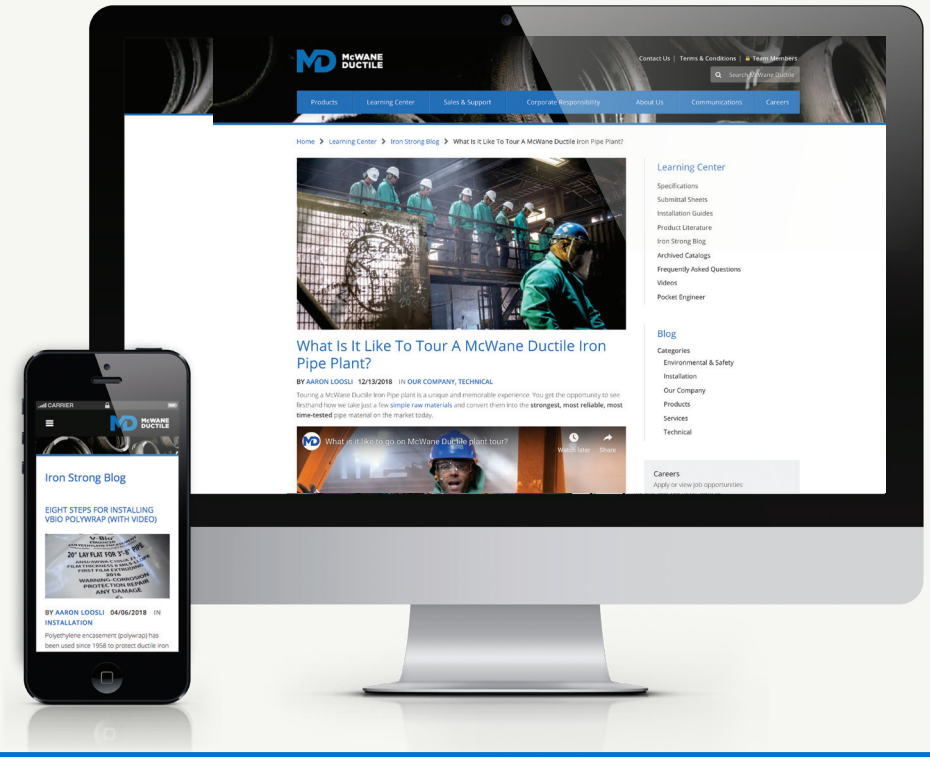
We also have two interesting feature articles in this issue. The first is a comprehensive review by John Johnson, Regional Engineer for McWane Ductile, of the new Design Decision Model (DDM). The new model was developed jointly through the research of Corrpro and the Ductile Iron Pipe Research Association. The DDM provides practical guidelines for protecting your pipelines according to various environmental conditions and the criticality of that asset.

Additionally, Roy Mundy, Senior Regional Engineer, and Jeff Henderson, National Accounts Manager, teamed up to provide insight on the various Design-Build construction methods. The use of these types of collaborative projects for construction continues to increase, and our team at McWane Ductile intends to position ourselves to be as educated and supportive as possible to our customers who engage in these types of projects.

As we move further into summer, here's hoping that everyone takes some time to rest and relax a little bit. And please, stop by and visit with our staff at any of the upcoming trade shows and conferences we will attend. If you can't make it to these events, be sure to engage with us on our website, YouTube, LinkedIn, Facebook and Twitter, where we post numerous educational blogs, videos and updates for water professionals. We look forward to discussing the many ways we can assist in Building Iron Strong Utilities for Generations.

Stuart Liddell
Sales Operations Manager
Sales Operations Department

CHECK OUT OUR BLOG FOR IRON STRONG INSIGHTS.



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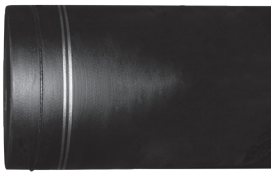
FOR MORE INFORMATION ON ALL THINGS MCWANE DUCTILE, FOLLOW US ON SOCIAL MEDIA.

BUILDING IRON STRONG UTILITIES FOR GENERATIONS

CORROSION PROTECTION RECOMMENDATIONS FOR DUCTILE IRON PIPELINE

BY JOHN JOHNSON, MCWANE DUCTILE
REGIONAL ENGINEER, ENV SP, NACE CT



Ductile iron pipe is one of the most widely used pipe materials in North America. The design life is second to no other pipe material due to its robust design. This pipe material is the strongest and most resilient available for water and wastewater utilities, providing unparalleled life-cycle value. In many areas, utilities need to consider how to protect these valuable pipelines from corrosive soils. The question is "How can we economically protect these pipelines to meet or exceed the 105–110-year average design life of Ductile iron pipe?"

Wouldn't it be excellent to have objective guidelines to evaluate corrosion risk and recommend the appropriate corrosion protection? And also have practical guidelines that consider the likelihood and consequences of a pipeline failure including the most recent innovations that recognize the differences between transmission mains and distribution mains?

BRIEF HISTORY OF THE DDM®

To address this need, the Ductile Iron Pipe Research Association (DIPRA) and Corrpro Companies (Corrpro — an Aegion Company) developed a two-dimensional risk-based model for corrosion control of Ductile iron pipelines in 2003 — the Design Decision Model (DDM®). DIPRA, its member-company technical representatives and Corrpro utilized more than 75 years of pipeline research data and hands-on experience with water and wastewater utilities and other experts in the field.

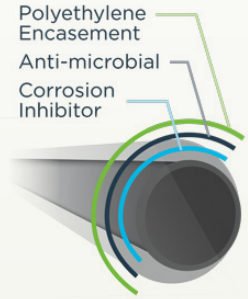
Over the last 15 years, that combined knowledge and experience has continued. New corrosion protection options have become mainstream, such as V-Bio® Enhanced Polyethylene Encasement (V-Bio®) and metallized zinc coating. These advancements resulted in the updated DDM® available today. Before we look at the new DDM® matrix, it's helpful to understand why the development of V-Bio® and the addition of a zinc coating option drove these updates.

As we know, polyethylene encasement has been providing highly effective front-line corrosion protection for iron pipe since 1958. DIPRA has numerous ongoing studies and corrosion test sites around the U.S. documenting its continued effectiveness over decades. With the addition of V-Bio® in 2013, corrosion protection levels were increased in three significant ways.

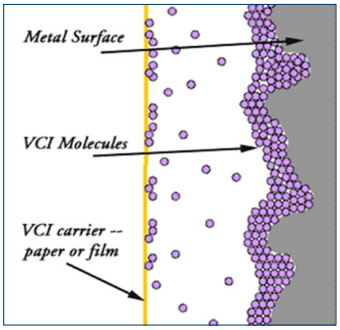
WHY V-BIO® ENHANCED POLYETHYLENE ENCASEMENT?

V-Bio® is a co-extruded, linear low-density polyethylene (LLDPE) film that is infused with a corrosion inhibitor and an anti-microbial component to provide active corrosion control to the already-proven protection offered by traditional polyethylene encasement.

These active additions inhibit the development of corrosion cells and repel the depolarizing microbes that may influence the rate of corrosion in a negative way. Both protect against corrosion without being consumed or degrading. The film's enhanced properties will last!

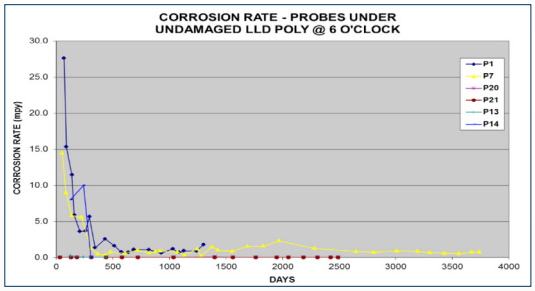


The diagram to the right illustrates how the VCI works. The buildup of corrosion inhibiting molecules provides resistance against the initiation of a corrosion cell.

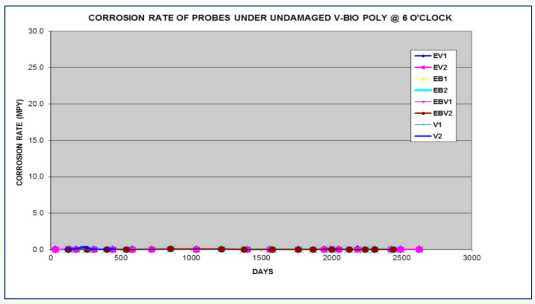


Loosely bonded hydrogen molecules on the metal surface control corrosion until they are dislodged by corrosion processes driven by dissolved oxygen molecules. VCI molecules are attracted to the surface to produce a strong polar bond, hydrogen film, thereby regaining control of the corrosion processes.

TRADITIONAL LLD POLYETHYLENE ENCASEMENT



V-BIO® ENHANCED POLYETHYLENE ENCASEMENT



As effective as traditional polyethylene encasement is, the graphic comparisons above illustrate the improved performance of V-Bio® under the same severely corrosive conditions.

HOW ECONOMICAL IS V-BIO® ENHANCED POLYETHYLENE ENCASEMENT?

V-Bio® is second to no other highly effective corrosion protection system, whether based on cost or effectiveness. Costs range from 1.5 percent to around 3 percent of project installation cost, depending upon pipe diameter.

WHAT ADDITIONAL PROTECTION DOES A ZINC COATING PROVIDE?

Zinc coating on iron pipes has been used in the water industry worldwide since the 1950s. Although zinc-coated Ductile iron pipe may be new to North America, it was first introduced in the 1980s by McWane Ductile's Canada Pipe Division, then known as CANRON.

In the past few years, water and wastewater utilities in the United States have started using zinc-coated DI pipe in conjunction with polyethylene encasement, including V-Bio®, to address more severe corrosion sites, or to provide an added level of protection from other utilities or contractors potentially damaging the V-Bio® in the future.

Historically, ISO zinc coatings could be applied in concentrations as low as 130g/m. However, McWane Ductile uses a minimum standard of 200 g/m² of arc applied 99.99 percent pure zinc with a finishing layer of standard shop-applied bituminous paint in accordance with ANSI/AWWA C151/A21.51. Check out our Iron Strong Blog about the various bonded coatings McWane Ductile offers at McWaneDuctile.com/Blog.

Although zinc coatings are never recommended as stand-alone protection in aggressive soils, the combination of properly installed V-Bio® and zinc provide an engineered system of corrosion control for Ductile iron pipe that will ensure the expected service life that utilities have come to expect from their Ductile iron pipelines, even in the most aggressive soils.

BRINGING IT ALL TOGETHER

Now that we've considered the driving reasons for the updates to the DDM®, let's look how the Two-Dimensional Matrix works for corrosion protection levels. The DDM® is a two-dimensional risk-based method of corrosion control that balances the likelihood of corrosion occurring against the consequences of a corrosion-related problem. Most recently, it was improved in recognition of the practical realities of corrosion control in distribution systems and transmission systems. Most significantly, the details of its use have been published, allowing utilities and their consultants to use the system.

CONSEQUENCE AXIS

The vertical axis represents the consequences of a failure with points assigned based on pertinent considerations related to the specific location of the pipe.

POINTS ARE ASSIGNED BASED ON:

- Pipe diameter
- Repair considerations
- Depth of cover
- Whether an alternate water supply is available

As points accumulate, the consequences of a failure push the recommendations into higher protection levels.

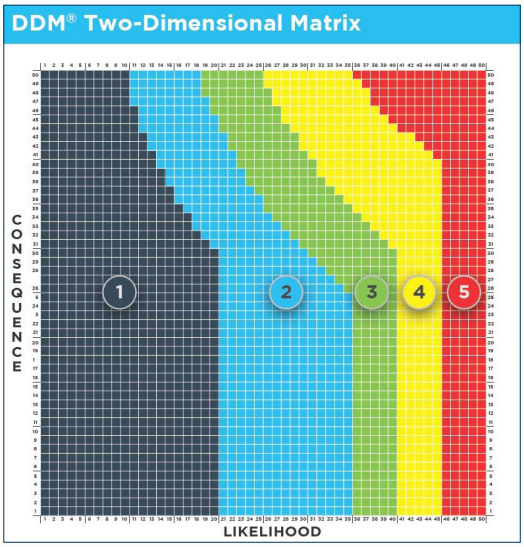
LIKELIHOOD FACTORS

The likelihood factors were updated to reflect the developments mentioned above, including the introduction of V-Bio®, a metallized zinc coating option, and 15 years of additional research and experience. The likelihood factors take into consideration measured corrosive values for:

- Soil resistivity
- Ground water table
- Redox
- Chlorides
- Sulfide ions
- Bi-Metallic corrosion
- Moisture content of the soil
- pH
- Known corrosive environments (includes cinders, mine waste, peat bog, landfill, fly ash and coal)

***Important Note:**
Soil measurements are often included in geotechnical site evaluation reports. A utility may have site soil measurements on hand already.

MOVING TO THE FINAL PHASE: RECOMMENDATIONS



Once the consequences and likelihood values are totaled, the two values can be used to plot the intersecting point on the DDM® graph. The color-coded recommendations table provides specific recommendations.

CONCLUSION

It's never been easier to meet sustainability low life cycle cost and maximum design life goals using SMaRT™ Certified Ductile iron pipe. Using the 2018 DDM® helps achieve these goals utilizing highly effective low-cost solutions.

WATER AND WASTEWATER DESIGN-BUILD INITIATIVES

BY ROY MUNDY, MCWANE DUCTILE SENIOR REGIONAL ENGINEER, P.E., ENV SP, ASSOC. DBIA & JEFF HENDERSON, MCWANE DUCTILE NATIONAL ACCOUNT MANAGER, ASSOC. DBIA

McWane Ductile has assembled a team of professionals to assist our clients and the industry in formulating quality and cost-effective projects to serve customers with their water and wastewater needs. This team consists of Registered Professional Engineers, National Association of Corrosion Engineers (NACE) Certified Technicians and ENVISION Sustainability Professionals with experience in managing utility operations, working in the consulting engineering industry, actual manufacturing experience in the pipe industry and decades of field exposure while providing resources and assistance with successful project completion.

The use of collaborative delivery methods for water and wastewater projects continues to steadily increase. Over the past decade, research conducted annually for the Water Design-Build Council (WDBC) on using these delivery methods reports that more and more owners are using them for their ability to achieve quality projects on schedule and within budget. Thus, McWane Ductile has now added Certified Associate DBIA Professionals to its team in order to fully understand this expanding model of delivery as it relates to water and wastewater projects. It is important to our company that we continue to provide resources for the benefit of our clients and potential clients in all aspects of project delivery.

A Best Practice in "Executing The Delivery of Design-Build Projects" considers that *All Design-Build Team Members Should Be Educated and Trained In The Design-Build Process, and Be Knowledgeable Of The Differences Between Design-Build and Other Delivery Systems.*

Today, the water market defines collaborative delivery methods as one of the following categories:

- Construction Management-At-Risk (CMAR)
- Progressive Design-Build (PDB)
- Fixed-Price Design-Build (FPDB)
- Design Build-Operate (DBO)

In addition, a key component of a successful Public-Private Partnership (P3) is the implementation of design-build best practices as defined by DBIA, which we collectively refer to as Design-Build Done Right®. This is because at the heart of most P3s is a cost-certain, schedule-certain design-build contract for the initial design and construction of the asset.

What distinguishes the Design-Build (DB) delivery methods from both Design-Bid-Build (DBB) and CMAR is single-point accountability for both design and construction. Rather than requiring the owner to have two separate contracts for design and construction, design-build delivery requires one contract between the owner and the design-builder. If an owner chooses this model, inherently the right design-build team must be selected, not only with knowledge of the process, an innate trust among the team and respective skills to deliver, but also with an innovative mindset to propose construction solutions to meet the goals of the owner in an efficient and effective manner. In order to perform efficiently in approaching this process, many times members of the design-build team are identified early on, which may include sub-contractors and manufacturers. This allows for as much input as possible from the very beginning to formulate design components.

In light of this approach, McWane Ductile wants to position itself to add value and expertise if selected as a team member, not only by understanding the intricacies of the process but also by proposing innovative approaches that are available both in product selection, operational attributes of our material and delivery efficiencies. These could include labor efficiencies of pipeline restraint systems, energy and life-cycle costs important to the owner and just-in-time delivery processes to ease costs to the contractor.

DBIA ASSOCIATE DESIGN-BUILD PROFESSIONAL™

Our experience early in this process has allowed us to offer alternative options to the historical assumptions of pipeline materials that can ultimately benefit all stakeholders. First, by giving the design-build team more efficient options for installation, including material selection for fill in the pipe trench, and second, by delivering a long-term material solution that the owner can trust for many years into the future.

McWane Ductile is committed to its involvement in the Design Build Institute of America and the progressive use of these models in construction of water and wastewater facilities. Our team members are actively involved in DBIA committees and conference attendance as well as achieving Associate DBIA Certification to better serve our customers who choose this project delivery method.

McWANE DUCTILE PROJECT PROFILES

NORTHEAST

Sales Region: Northeast

Sales Representative: Jeff Houser

Project Location: Bloomfield, CT

Project Owner/Utility: The Metropolitan District Commission, Hartford, CT

Project Engineer: Frank Cahill-Project Manager-MDC

Project Contractor: LTC Construction, New Britain, CT

Project Distributor: F.W. Webb Hartford, CT

Types of DIP used on the project:

Diameter	Joint	Class	Footage
30"	TR Flex®	54	3,432
30"	Tyton®	54	3,318
20"	Tyton®	54	36
12"	Tyton®	54	36

Phase I of the Bloomfield Transmission Main Extension is a 1.3-mile, 30-inch diameter water transmission main with 8 mil Polywrap for the Hartford Metropolitan District Commission (MDC) in Bloomfield, Connecticut. The overall project will connect two previously constructed sections of mains.

The 1.3-mile-long project area is situated in primarily a residential area and contains two large churches as well as the Wintonbury Early Childhood Magnet School. Maple Avenue and Brown Street are both approximately 30-foot-wide local town roads with moderate traffic volume. The project also involves the crossing of Connecticut State Road Route 178, also known as Mountain Avenue, which is a signaled intersection, three lanes wide in each direction.

The project area contains existing underground utilities such as water, sewer, storm and gas, which necessitates the adjustment of both the horizontal and vertical alignment of the new transmission main throughout the project limits. Average cover on the transmission will be 4.5 feet. In some locations, such as the crossing of a town-owned 60-inch culvert at Tumble Brook, cover will be as much as 10 feet.

The successful low bidder, LTC Construction of New Britain, Connecticut, having worked in the MDC jurisdiction in the past, was up to the challenge to tackle this vital transmission main for the district. LTC Construction selected local McWane Ductile distributor F.W. Webb of Hartford, Connecticut, to supply the Ductile iron pipe and accessories required for this project. Coordination of pipe production and timely scheduling of deliveries has been a crucial part in keeping LTC construction on track. The project is expected to be completed in the summer of 2019.

MIDWEST

Sales Region: Midwest
Sales Representative: Kevin Ratcliffe
Project Location: Mentor, Ohio
Project Owner/Utility: Lake County Commissioners
Project Engineer: Connecticut Consultants
Project Contractor: Mark Haynes Construction

Types of DIP used on the project:

Diameter	Joint	Class	Footage
36"	Tyton®	52	872
30"	Other	55	900
30"	Tyton®	52	600

The purpose of this project was to replace older, existing corrugated metal pipe with Ductile iron pipe, but this was not a typical sewer line job. This was mostly an above-ground aerial sewer project that took a great deal of collaboration between McWane Ductile, the distributor and the contractor. This project also involved working with the McWane Ductile's Flange Fabrication Department to provide marked laying drawings prior to manufacturing. The work covered by the plans and specs was in two sequential work steps referred to as Part A and Part B.

Part A — Work consisted of clearing operations that included roughly 4.5 acres of trees, shrubs, tall grasses and other vegetation in and adjacent to the Mentor Marsh and within the right-of-way limits of Becker Ave. Work also included excavation and embankment construction to provide access to the site. A section of timber was purchased to increase maneuverability for equipment in the protected ecological area and to avoid disturbing the natural marsh. Clearing operations were limited to the dates indicated in the final permit issued for this project by the Department of the Army Buffalo District Corps of Engineers.

Part B — Work consisted of the replacement of 4,300 lineal feet of existing sanitary sewer and manholes. Work included aerial sewers and a box culvert supported on timber piles, temporary bypass pumping, construction of an access road partially comprised of aggregate layers stabilized with geogrid material, the installation of 530 lineal feet of steel sheet piling, realignment of an existing stream, storm culvert and box culverts, additional excavation/embankment construction and restoration. The project began at the intersection of Forest Road and Woodridge Road then ran southwesterly to an existing sanitary manhole located at the Gary I. Kron Water Reclamation Facility.

McWane Ductile is proud to have worked with Connecticut Consultants, Mark Haynes Construction and the Lake County Commissioners to complete the new aerial sewer project for Mentor, Ohio. Together, we're building iron strong utilities for generations!

SOUTH

Sales Region: South

Sales Representative: Eddie Lowe

Project Location: Mt. Gallant Road Transmission Water Main, Rock Hill, SC

Project Owner/Utility: City of Rock Hill

Project Engineer: Arcadis US, Inc., Charlotte, NC

Project Contractor: Payne McGinn & Cummins Travelers Rest, SC

Project Distributor: Southern Utility Supply Greenville, SC

Types of DIP used on the project:

Diameter	Joint	Class	Footage
36"	Tyton®	250	903
24"	TR Flex®	350	4,466
24"	Tyton®	350	657

The City of Rock Hill located in York County, South Carolina, just south of Charlotte, North Carolina, continues to grow rapidly. Rock Hill Utilities realized the need to aggressively increase the volume of water for its wholesale and retail customers and implemented a waterworks project that involved the installation of McWane Ductile pipe with a combination of TR Flex®, Tyton® and Tyton® with Sure Stop Gaskets. Some areas required Viton gaskets due to the make-up of the soil.

The primary raw water source is the nearly 12,455-acre Lake Wylie. This latest project used local, state and federal funding to complete the fourth phase of a five-year capital improvement plan. Along with numerous parks and outdoor activity centers, Rock Hill is home to Winthrop University with an enrollment of approximately 6,000 students; the Giordana Velodrome, a 250m world class track cycling facility; and a BMX Supercross Track, the only Olympic-caliber training facility on the U.S. east coast,.

The City of Rock Hill continues to attract new residents from across the country. Most recently, the Carolina Panthers. Rock Hill was selected as the new location for the Panthers headquarters, complete with hotel, a state-of-the-art sports medical facility, retail shops and an indoor practice field with up to 10,000 spectator seats and a half dozen or so outdoor fields. The economic impact is expected to be in the hundreds of millions of dollars.

WEST

Sales Region: West
Sales Representative: Carrie Stephens
Project Location: Clackamas, OR
Project Owner/Utility: Clackamas River Water
Project Engineer: Clackamas River Water
Project Contractor: Tapani, Inc.
Project Distributor: Core & Main, Lake Oswego branch

Types of DIP used on the project:

Diameter	Joint	Class	Footage
20"	Tyton®	52	8,652
18"	TR Flex®	52	1,586
6"	Tyton®	52	471

Tapani, Inc. of Battle Ground, Washington, was awarded the Hattan Road Transmission Main project, one of several projects in Phase 1 of an infrastructure improvement plan Clackamas River Water refers to as "The Backbone Project." Once implemented, it will provide improved pumping, distribution and water storage. The Hattan Road project is replacing outdated and undersized cast iron waterlines, which will improve water transmission efficiency and capacity to their southern service area.

The Ductile iron pipes installed included a 20-inch and 6-inch line restrained by utilizing McWane Sure Stop 350® Gaskets. The 18-inch line was installed in a steep area, portions of which had a 30 percent grade. Therefore, this section was installed using TR Flex® pipe and fittings, all of which was wrapped in V-Bio® Polyethylene Encasement. The old cast iron pipe is getting a second life as drain pipe.

Phase 1 of the Backbone Project began in 2016 and is expected to be complete in early 2020, followed by five projects in Phase 2, with a goal to completed by the end of 2023.

We appreciate the opportunity to work with Core & Main and Tapani, providing the Ductile iron pipe on this important improvement project.

TREATMENT PLANT

Sales Region: Treatment Plant
Sales Representative: Darcie Keirns
Project Location: Louisville, KY
Project Owner/Utility: Louisville MSD
Project Engineer: Burgess and Niple
Project Contractor: Ulliman Schutte

Types of DIP used on the project:

Diameter	Joint	Class	Tons
3–48"	Fabricated & Flange	Min CL53	58
3–48"	Flange	C153 Fittings	16

Ulliman Schutte Construction is nearing completion of a new combined sewer overflow storage basin for the Louisville Metropolitan Sewer District in Kentucky.

This CSO basin is capable of holding 20 million gallons and will help mitigate combined sewer overflows during heavy rains. The combined sewage will be stored in the basin until capacity is available in the collection system, at which time the flow will be pumped out of the basin for treatment at a water quality treatment center. After the flow is pumped out, 10 flushing gates are filled via Ductile iron pipes and are flushed one at a time to clean the floor of the basin. Once all the flushing lanes are flushed, a tipping bucket at the cross-channel sump fills and tips to clean any remaining solids.

The CSO Basin is built in the Great Lawn of the historic Shawnee Park. This park was dedicated around 1900 and is as one of three flagship parks in Louisville's Olmsted Parks system. Once finished, the project provided more benefits to Louisville than just safe, clean waterways. New restrooms were constructed at the park, along with an open-air pavilion, basketball courts were renovated and other park restorations were completed that benefit the surrounding community.

Approximately 300,000 cubic yards of earth were moved in order to construct the basin and ultimately bury it approximately 12 feet below grade. Approximately 22,000 cubic yards of concrete were used during construction of the basin.

Ulliman Schutte finished this project ahead of schedule and under budget. They were able to leverage local labor and local minority and woman-owned businesses during construction. The project helped the local economy and will benefit the community and the environment for future generations.

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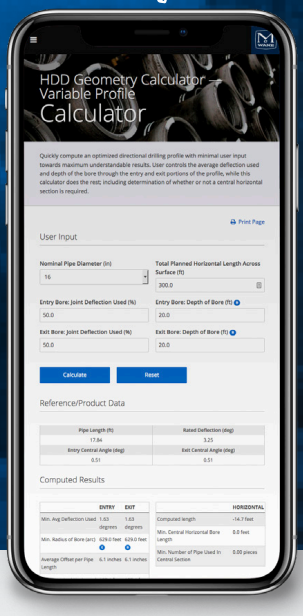
When it comes to Horizontal Directional Drilling, nothing is easy. Or at least that's how it used to be. Today, HDD is as simple as the push of a button thanks to the **McWane Pocket Engineer™**. Designed to simplify the complex calculations needed to complete your drill-op, the Pocket Engineer compiles 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.



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mcwaneductile.com

BUILDING IRON STRONG UTILITIES FOR GENERATIONS

Hey Ditch Doctor,

Can I use a TR Flex® restrained joint spigot into a standard Tyton® push-joint bell? Not sure how I wound up this with current combo of available pipes, but can this work? The project inspector is not letting me move forward until we get an opinion from you.

Sincerely,

Stopped in Stockbridge

Dear Stopped,

Yes, a fabricated TR Flex® spigot end can be successfully mated with a Tyton® joint bell. In fact, a TR Flex® bell is simply an as-cast, single-pour extension of the bell to house the fabricated spigot end plus the restraining segments that longitudinally lock the otherwise still-flexible joint. There is a full-capacity Tyton® joint portion of the bell behind this integrally cast extension, where the exact same watertight radial-compression of the rubber Tyton® gasket occurs by insertion of the pipe spigot across it. By design, the weld-bead on the fabricated end (which works with the restraining segments in a true TR Flex® joint) lands just outside of the Tyton® joint bell-face, whether inside a TR Flex® joint or not.

So yeah, no harm, no foul and no restriction created on the deflection of the joint. Just wasted fabrication dollars for the spigot end, as the weld-bead will not serve its purpose in a Tyton® joint assembly.

More concerning, as you know, is that each and every fabricated spigot is sent to the site as a planned companion for a TR Flex® bell. And robbing from the "restrained" to pay the "non," for whatever reason you need now could create a complicated shortfall later in your pipeline construction.

It would not be a good day if next week or later you reach for a critical piece of restrained joint pipe when needed ... and it's not there ... because you used it here. So please, advise and coordinate any substitutions with your pipe provider so that replacement or other options can be employed, before it's a shutdown crisis. That's the worst for everybody!

And one last note ... the spigot stripes on a fabricated TR Flex® end are applied at a point on the barrel exterior to align with the extended as-cast TR Flex® bell. So, don't freak out when they land a few inches or more from the Tyton® bell you've pushed it into. The reassuring "thump" sound made when the spigot end homes into the bell shoulder is all you need to know all is well. Hope this gets you back to laying pipe, making good money and quality water supply or sewer management as designed!

Sincerely,

Ditch Doctor

Mr. Ditch Doctor,

They're asking me to remove and relay a portion of my newly constructed Ductile iron pipeline because some of the spigot stripes are visible outside of the completed joint. Is this a real concern? What explanation or reason can I provide to avoid this profit-chewing rework? Please help!

Sincerely,

Miffed in Michigan

Dear Miffed,

The spigot stripes are applied during the process of pipe manufacturing at a location on the barrel exterior where, ideally, the leading stripe is not visible. The trailing stripe is planned to be visible yet flush with the bell face in a completed push-on Ductile iron pipe joint assembly. During post-assembly joint deflection, the leading stripe can become completely visible on the outside edge of the deflected joint as you approach maximum recommended deflection limits for the joint.

Either way, or in a joint, such as with a field-cut and re-beveled pipe, where there are no spigot stripes involved, maximum deflection of a Tyton® joint (5 degrees for 3-inch to 36-inch Ductile iron pipe) equates to 1-inch of offset for each laying foot of pipe away from the bell face (i.e., 10 inches total for a 10-foot spool piece), and serves as the point when metal computes to contacting metal within the joint. The machine operator, or trenchman with a push-bar, will certainly feel it when, or if, it occurs. And with Ductile iron pipe it takes significant force to deflect any further.

Minor visible variations of this ideal are not necessarily a cause for concern, within reasonable limits. In a completed fully homed Tyton® joint, the ultimate end of the spigot lands nearly two inches past the compressed gasket. So, unless the stripes appear that far off the front edge of the bell itself ... no worries.

In truth, the spigot stripes serve best as an alignment guide during joint assembly. If the spigot stripes are visually parallel to the bell face as the spigot approaches and inserts into the joint, you are doing it right, and chances to displace the gasket are minimized, for any diameter. The "thump" home is the next best indicator of a proper joint assembly.

In a restrained joint assembly, such as TR-Flex®, when the joint is manually extended as described in the installation procedure, or upon initial hydrostatic pressurization, the joint will reliably expand to a point where both spigot stripes are visible in full.

All diameters of TR Flex® pipe are designed to provide expansion of between 1/2 to 3/4 of an inch, depending on diameter. On the other hand, Tyton joint assemblies are/must be controlled to not expand upon filling and pressurization by thrust blocking or other measures available. So yes, the position of the stripes, down to a minimal level at which yours are being judged, really is much ado about nothing. Now, get back to work!

Sincerely,

Ditch Doctor

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From estimating to design, from production to installation, we take great pride in providing education to water professsionals. Check out our presentations offered at these upcoming events.

MASD CONFERENCE & PRESENTATION SCHEDULE
SUMMER 2019

CONFERENCE	PRESENTER	DATE	LOCATION	TOPIC
KY/TN Water Professionals Conference	ROY MUNDY	8/18/19	Louisville, KY	Generational Attitudes in the Workplace
KY/TN Water Professionals Conference	John Simpson	8/18/19	Louisville, KY	Sustainability of Lower Energy Costs by Utilization of Proper Pipeline Materials
National Rural Water Conference	Roy Mundy	9/9/19	Nashville, TN	Generational Attitudes in the Workplace

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