ELDRIDGE ELECTRIC AND WATER UTILITY BOARD

September 6, 2022
5:00 pm
Eldridge Community Center, 400 South 16th Avenue

1. Call to order
2. Public Comment
3. Approval of Agenda
4. Approval of Minutes from August 16, 2022

5. Financial
   A. Consideration to Approve Bills Payable

6. Electric Department – Mike Anderson
   A. PCA
   B. Department update

7. Water Department – Brock Kroeger
   A. Water Test Results
   B. Soil Test Results
   C. Department Update

8. Administrative –
   A. Consideration of Employee Handbook and HR Assistance

9. Adjournment

NEXT REGULAR MEETING Tuesday, September 20, 2022 at 5:00pm

Agenda

The regular meeting of the Eldridge Electric and Water Utility Board was called to order at 5:00 P.M. on August 16, 2022, at Eldridge Community Center.

Board members present were Brock Kroeger, Jim Skadal, Mike Anderson, Barb O'Brien, and Jim Roseman. Also present was Jacob Rowe Tony Rupe and Jody Coffman. Visitor Dan Collins.

Public Comment- None

Motion by Anderson, second by Roseman to approve the agenda. All ayes.

Motion by O'Brien, second by Skadal to approve the minutes from August 2, 2022. All ayes.

FINANCIAL – Motion by Kroeger to approve bills payable in the amount of $62,930.05 second by Anderson. All ayes.

ELECTRIC –
An outage was reported on 8/9/22 at 845 E. Lincoln Rd. The outage lasted from 9a.m to 12 pm affecting one customer. The cause was a broken secondary neutral.
Rowe UPDATED THE Board on the PCA and how it is trending at this time.

Department update: The crew has been doing IUB inspections and moved a pole for the 1st St and LeClaire Rd project.

WATER-
On 8/9/22 there was a water main break at 1520 E. LeClaire Rd. The break took 7 hours to repair, effecting 54 customers and with a water loss of 373,350 gallons of water.
On 8/10/22 at 121 S. 14th Ave there was a water main break. The break took 7 hours to repair, effecting 4 customer and a water loss of 37,7900 gallons of water.
On 8/12/22 at 200 S. 1st St. a valve broke to shut off the main. This still ongoing, effecting one customer and a loss of 172,800 gallons of water.

Rowe asked the Board if the water department could purchase a DI Chainsaw. After a brief discussion, Skadal made a motion to make the purchase, second by O'Brien. All ayes.

Department update: The crew has been following up on the main breaks.

ADMINISTRATIVE –
Coffman gave an explanation of the Incode Scanning add on. After a brief discussion Kroeger made a motion to purchase, with a second by Skadal. All ayes.

Motion by Anderson to adjourn the meeting at 5:28 P.M., second by Skadal. All ayes.

Respectfully submitted,
Jody Coffman, Billing Clerk

Agenda

Utility Bills Payable for September 6, 2022

TOTAL CHECKS		176,811.51
MidAmerican Wire Transfer- WS4 -		70,000.00
Louisa energy charge -		84,000.00
CMMPA		396,916.30
Credit Cards		1,252.70
PAYROLL - August 20, 2022		$28,972.93
PAYROLL-September 6, 2022	$	32,085.59
TOTAL		**790,039.03**

VENDOR SET: 01 City of Eldridge
BANK: 00 FIRST CENTRAL UTILITY
DATE RANGE: 0/00/0000 THRU 99/99/9999

Agenda

VENDOR I.D.	NAME	STATUS	CHECK DATE	AMOUNT	DISCOUNT	CHECK NO	CHECK STATUS	CHECK AMOUNT
000691	VERIZON WIRELESS							
I-9913096474U	WIRELESS	R	8/22/2022			224725		
630 5-820-6373	TELEPHONE	WIRELESS		231.58				
600 5-810-6373	TELEPHONE	WIRELESS		82.92				314.50
000890	DELTA DENTAL							
I-30002000002202209U	BENEFTIS	R	8/29/2022			224726		
600 5-810-6150	GROUP INSURANCE	DELTA DENTAL		140.63				
630 5-820-6150	GROUP INSURANCE	DELTA DENTAL		219.87				360.50
002227	UNUM LIFE INSURANCE COMPANY OF							
I-202208293099	BENEFITS	R	8/29/2022			224727		
600 5-810-6150	GROUP INSURANCE	LIFE INSURANCE		115.39				
630 5-820-6150	GROUP INSURANCE	LIFE INSURANCE		220.52				335.91
000033	WELLMARK BLUE CROSS							
I-222230000027U	BENEFITS	R	8/29/2022			224728		
600 5-810-6150	GROUP INSURANCE	PREMIUMS		2,719.13				
630 5-820-6150	GROUP INSURANCE	PREMIUMS		4,601.86				7,320.99
000459	U.S. POST OFFICE							
I-202208313118	POSTAGE	R	8/31/2022			224729		
630 5-820-6508	POSTAGE	POSTAGE		1,423.50				1,423.50
002031	ACCESS SYSTEMS LEASING							
I-32268310U	COPIER LEASE	R	9/01/2022			224730		
630 5-820-6340	OFFICE EQUIPMENT MAINTENANCE	COPIER LEASE		96.25				96.25
000817	ACCO UNLIMITED CORP.							
I-0225416-IN	CAUSTIC	R	9/01/2022			224731		
600 5-810-6501	TREATMENT MATERIALS	CAUSTIC		3,388.00				3,388.00
000324	ADAIR COUNTY TREASURER							
I-202208303100	PROPERTY TAXES	R	9/01/2022			224732		
630 5-820-64181	PROPERTY TAXES	PROPERTY TAXES		3,173.00				3,173.00
001048	ADVANTAGE TREE SERVICES LLC							
I-28732	TREE WORK	R	9/01/2022			224733		
630 5-820-6456	TREE TRIMMING	TREE WORK		18,359.50				18,359.50
002588	ALWAYS CLEAN LLC							
I-5280FFU	OFFICE CLEANING	R	9/01/2022			224734		
630 5-820-6310	B & G MATERIAL	OFFICE CLEANING		205.50				205.50

Agenda

VENDOR I.D.	NAME	STATUS	CHECK DATE	AMOUNT	DISCOUNT	CHECK NO	CHECK STATUS	CHECK AMOUNT
000331	CASS COUNTY TREASURER							
I-202208303104	PROPERTRY TAXES	R	9/01/2022			224735		
630 5-820-64181	PROPERTY TAXES	PROPERTRY TAXES		3,235.00				3,235.00
000047	CENTRAL SCOTT TELEPHONE							
I-202208303106	INTERNET/TELEPHONE	R	9/01/2022			224736		
600 5-810-6373	TELEPHONE	INTERNET/TELEPHONE		278.69				
630 5-820-6373	TELEPHONE	INTERNET/TELEPHONE		545.15				823.84
000131	CINTAS CORPORATION							
I-4128011306U	MATS	R	9/01/2022			224737		
630 5-820-6310	B & G MATERIAL	MATS		42.68				
I-5119708759U	GARAGE	R	9/01/2022			224737		
630 5-820-6310	B & G MATERIAL	GARAGE		54.15				96.83
000231	COMMUNITY ACTION OF EASTERN IO							
I-202208303107	PROJECT SHARE	R	9/01/2022			224738		
630 5-820-64131	PROJECT SHARE REMITTANCE	PROJECT SHARE		64.00				64.00
000333	DALLAS COUNTY TREASURER							
I-202208303108	PROPERTY TAXES	R	9/01/2022			224739		
630 5-820-64181	PROPERTY TAXES	PROPERTY TAXES		2,197.00				2,197.00
000103	ELDRIDGE WELDING							
I-108271	WATER VALVE WRENCH	R	9/01/2022			224740		
600 5-810-6332	VEHICLE MAINTENANCE	WATER VALVE WRENCH		45.00				45.00
003659	HAWKEYE SEWER & WATER CONSTRUC							
I-HS22036	VALVE REPLACEMENT	R	9/01/2022			224741		
600 5-810-6520	BUILDING SUPPLIES	VALVE REPLACEMENT		8,251.54				
I-HS22037	12" VALVE REPLACEMENT	R	9/01/2022			224741		
600 5-810-6520	BUILDING SUPPLIES	12" VALVE REPLACEMEN		450.00				8,701.54
003226	HAWKINS INC.							
I-6260350	CHLORINE	R	9/01/2022			224742		
600 5-810-6501	TREATMENT MATERIALS	CHLORINE		1,467.54				1,467.54
000228	IOWA ONE CALL							
I-243739	LOCATES	R	9/01/2022			224743		
630 5-820-6450	OTHER CONTRACTED SERVICES	LOCATES		178.40				178.40
000429	J & R SUPPLY INC							
I-2207792-IN	1/2 COMP TEE	R	9/01/2022			224744		
600 5-810-6311	WATER PLANT MAINTENANCE	1/2 COMP TEE		115.00				
I-2207797-IN	HI PRESS EJECTOR	R	9/01/2022			224744		
600 5-810-6311	WATER PLANT MAINTENANCE	HI PRESS EJECTOR		2,913.50				3,028.50

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VENDOR I.D.	NAME	STATUS	CHECK DATE	AMOUNT	DISCOUNT	CHECK NO	CHECK STATUS	CHECK AMOUNT
001493	JOHNSON CONTROLS SECURITY SOLU							
I-37730765	QUARTERLY BILLING	R	9/01/2022			224745		
600 5-810-6520	BUILDING SUPPLIES	QUARTERLY BILLING		419.83				419.83
001670	KINGS MATERIAL INC							
I-KMI8007276	3X8X16C SOLID	R	9/01/2022			224746		
630 5-820-6310	B & G MATERIAL	3X8X16C SOLID		22.61				22.61
000269	LOUISA COUNTY TREASURER							
I-202208303110	PROPERTY TAXES	R	9/01/2022			224747		
630 5-820-64181	PROPERTY TAXES	PROPERTY TAXES		4,113.00				4,113.00
000316	MADISON COUNTY TREASURER							
I-202208303111	PROPERTY TAXES	R	9/01/2022			224748		
630 5-820-64181	PROPERTY TAXES	PROPERTY TAXES		2,444.00				2,444.00
002608	MERSCHMAN HARDWARE							
I-46515	ETHERNET CABLE REG STATION	R	9/01/2022			224749		
630 5-820-6507	OPERATING SUPPLIES & MATERIALSETHERNET CABLE REG S			8.77				
I-46643	EXT PIPE FOR VAC	R	9/01/2022			224749		
600 5-810-63711	OPERATING SUPPLIES & MATERIAL	EXT PIPE FOR VAC		66.28				
I-46650	WEED EATER STRING	R	9/01/2022			224749		
600 5-810-63711	OPERATING SUPPLIES & MATERIAL	WEED EATER STRING		9.99				
I-46653	TOGGLE SWITCH	R	9/01/2022			224749		
600 5-810-6310	B & G MATERIAL	TOGGLE SWITCH		6.89				
I-46757	LEVEL	R	9/01/2022			224749		
600 5-810-6765	MINOR PROJECTS	LEVEL		11.99				
I-46768	BLEACH DISENFECTING TEST PARTS	R	9/01/2022			224749		
600 5-810-63711	OPERATING SUPPLIES & MATERIAL	BLEACH DISENFECTING		20.55				
I-46771	OIL	R	9/01/2022			224749		
600 5-810-6310	B & G MATERIAL	OIL		14.99				
I-46801	UNDERGROUND WIRE NUTS	R	9/01/2022			224749		
600 5-810-63711	OPERATING SUPPLIES & MATERIAL	UNDERGROUND WIRE NUT		11.18				
I-46814	BAC T TEST PART HOSES	R	9/01/2022			224749		
600 5-810-63711	OPERATING SUPPLIES & MATERIAL	BAC T TEST PART HOSE		57.98				
I-46846	FASTENERS	R	9/01/2022			224749		
600 5-810-6332	VEHICLE MAINTENANCE	FASTENERS		1.98				210.60
001512	MIDAMERICAN ENERGY COMPANY							
I-529255749	UTILITIES	R	9/01/2022			224750		
600 5-810-6371	UTILITIES	401 S 16TH AVE GENER		12.46				
600 5-810-6371	UTILITIES	853 N 1ST GENERATOR		14.01				
600 5-810-6371	UTILITIES	851N 1ST ST WELL 5		17.09				
630 5-820-6371	UTILITIES	120 E IOWA ST		14.01				
600 5-810-6371	UTILITIES	503 W DONAHUE ST		295.23				
600 5-810-6371	UTILITIES	212 N 3RD ST		15.55				368.35

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000293	MIDWEST WHEEL							
I-2915610-00	OLD TANDEM	R	9/01/2022			224751		
600 5-810-6332	VEHICLE MAINTENANCE	OLD TANDEM		101.18				101.18
000763	MUSCATINE COUNTY TREAS							
I-202208303112	PROPERTY TAXES	R	9/01/2022			224752		
630 5-820-64181	PROPERTY TAXES	PROPERTY TAXES		28.00				28.00
002730	NERC							
I-28835	ASSESSMENT	R	9/01/2022			224753		
630 5-820-6416	DUES AND ASSESSMENTS	ASSESSMENT		553.86				553.86
000335	POLK COUNTY TREASURER							
I-202208303113	PROPERTY TAXES	R	9/01/2022			224754		
630 5-820-64181	PROPERTY TAXES	PROPERTY TAXES		2,179.00				2,179.00
000337	POTTAWATTAMIE COUNTY TREASURER							
I-202208303114	PROPERTY TAXES	R	9/01/2022			224755		
630 5-820-64181	PROPERTY TAXES	PROPERTY TAXES		15,646.00				15,646.00
003828	QC ANALYTICAL SERVICES LLC							
I-2208285	COLIFORM	R	9/01/2022			224756		
600 5-810-6451	WATER TESTING	COLIFORM		168.00				168.00
000356	QC METALLURGICAL LAB							
I-B2512	BACTERIA ECOLI	R	9/01/2022			224757		
600 5-810-6451	WATER TESTING	BACTERIA ECOLI		75.00				
I-B2642	BACTERIA ECOLI	R	9/01/2022			224757		
600 5-810-6451	WATER TESTING	BACTERIA ECOLI		75.00				
I-B2823	BACTERIA ECOLI	R	9/01/2022			224757		
600 5-810-6451	WATER TESTING	BACTERIA ECOLI		25.00				175.00
000254	QUAD CITIES TAS							
I-220810070U	ANSWERING SERVICES	R	9/01/2022			224758		
600 5-810-6373	TELEPHONE	ANSWERING SERVICES		28.27				
630 5-820-6373	TELEPHONE	ANSWERING SERVICES		28.28				56.55
002272	QUAD CITIES WINWATER CO							
I-032563 01	2640-30 12 MJ GATE VLV	R	9/01/2022			224759		
600 5-810-63711	OPERATING SUPPLIES & MATERIAL	2640-30 12 MJ GATE V		5,406.33				5,406.33
000873	RIVER CITY TURF & ORNAMENTAL							
I-66020836	GRASS SEED	R	9/01/2022			224760		
600 5-810-63711	OPERATING SUPPLIES & MATERIAL	GRASS SEED		145.00				145.00

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VENDOR I.D.	NAME	STATUS	CHECK DATE	AMOUNT	DISCOUNT	CHECK NO	CHECK STATUS	CHECK AMOUNT
000388	RIVER VALLEY COOPERATIVE							
I-1709005	2 4-D R-UP	R	9/01/2022			224761		
600 5-810-6310	B & G MATERIAL	2 4-D R-UP		601.75				601.75
001269	SAM, LLC							
I-14231U	BI-ANNUAL INTEGRITY GIS WEBSIT	R	9/01/2022			224762		
630 5-820-6420	MAPPING	BI-ANNUAL INTEGRITY		450.00				
600 5-810-6420	MAPPING	BI-ANNUAL INTEGRITY		450.00				900.00
000403	SCOTT COUNTY TREASURER							
I-202208303117	PROPERTY TAXES	R	9/01/2022			224763		
630 5-820-64181	PROPERTY TAXES	PROPERTY TAXES		15,118.00				15,118.00
001982	SHARED IT INC							
I-9579U	IT SERVICES, OFFICE 365	R	9/01/2022			224764		
600 5-810-6373	TELEPHONE	IT SERVICES, OFFICE		126.55				
630 5-820-6373	TELEPHONE	IT SERVICES, OFFICE		127.20				253.75
000418	SKARSHAUG TESTING LAB							
I-261821	GLOVE CLEAN/TEST	R	9/01/2022			224765		
630 5-820-6457	SAFETY TESTING	GLOVE CLEAN/TEST		90.43				
I-262139	PR SLEEVES CLEAN/TEST	R	9/01/2022			224765		
630 5-820-6457	SAFETY TESTING	PR SLEEVES CLEAN/TES		67.95				158.38
001505	STUART C IRBY CO							
I-S013090276.001	3 PHASE TRANSFORMERS	R	9/01/2022			224766		
630 5-820-6560	INTO INVENTORY	3 PHASE TRANSFORMERS		27,499.00				
I-S013152645.001	SPLICE	R	9/01/2022			224766		
630 5-820-6560	INTO INVENTORY	SPLICE		49.49				
I-S013152645.002	SPLICE WIRE	R	9/01/2022			224766		
630 5-820-6560	INTO INVENTORY	SPLICE WIRE		695.50				
I-S013157008.001	BOLTS	R	9/01/2022			224766		
630 5-820-6560	INTO INVENTORY	BOLTS		376.64				
I-S013157008.002	BELT HOOKS	R	9/01/2022			224766		
630 5-820-6512	TOOLS	BELT HOOKS		23.11				28,643.74
003900	TYLER TECHNOLOGIES							
I-202208313122	CONTENT MANAGER SUITE	R	9/01/2022			224767		
630 5-820-65061	COMPUTER SUPPLIES	CONTENT MANAGER SUIT		4,857.50				4,857.50
000470	UTILITY EQUIPMENT CO.							
I-10096453-00	SAMPLING STATIONS	R	9/01/2022			224768		
600 5-810-6780	CAPITAL - SYSTEM	SAMPLING STATIONS		37,826.00				37,826.00

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Agenda

VENDOR I.D.	NAME	STATUS	CHECK DATE	AMOUNT	DISCOUNT	CHECK NO	CHECK STATUS	CHECK AMOUNT
000650	WEX BANK							
I-83046218U	FUEL	R	9/01/2022			224769		
600 5-810-6331	VEHICLE OPERATION	FUEL		592.95				
630 5-820-6331	VEHICLE OPERATION	FUEL		760.66				1,353.61
003162	WHITE CAP, LP							
I-10016656031	GAS CAN SLING	R	9/01/2022			224770		
600 5-810-6765	MINOR PROJECTS	GAS CAN SLING		246.17				246.17

* * TOTALS * *	NO			INVOICE AMOUNT	DISCOUNTS	CHECK AMOUNT
REGULAR CHECKS:	46			176,811.51	0.00	176,811.51
HAND CHECKS:	0			0.00	0.00	0.00
DRAFTS:	0			0.00	0.00	0.00
EFT:	0			0.00	0.00	0.00
NON CHECKS:	0			0.00	0.00	0.00
VOID CHECKS:	0	VOID DEBITS	0.00			
		VOID CREDITS	0.00	0.00	0.00	

TOTAL ERRORS: 0

** G/L ACCOUNT TOTALS **

G/L ACCOUNT	NAME	AMOUNT
600 5-810-6150	GROUP INSURANCE	2,975.15
600 5-810-6310	B & G MATERIAL	623.63
600 5-810-6311	WATER PLANT MAINTENANCE	3,028.50
600 5-810-6331	VEHICLE OPERATION	592.95
600 5-810-6332	VEHICLE MAINTENANCE	148.16
600 5-810-6371	UTILITIES	354.34
600 5-810-63711	OPERATING SUPPLIES & MATERIAL	5,717.31
600 5-810-6373	TELEPHONE	516.43
600 5-810-6420	MAPPING	450.00
600 5-810-6451	WATER TESTING	343.00
600 5-810-6501	TREATMENT MATERIALS	4,855.54
600 5-810-6520	BUILDING SUPPLIES	9,121.37
600 5-810-6765	MINOR PROJECTS	258.16
600 5-810-6780	CAPITAL - SYSTEM	37,826.00
	*** FUND TOTAL ***	66,810.54
630 5-820-6150	GROUP INSURANCE	5,042.25
630 5-820-6310	B & G MATERIAL	324.94
630 5-820-6331	VEHICLE OPERATION	760.66
630 5-820-6340	OFFICE EQUIPMENT MAINTENANCE	96.25

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Agenda

** G/L ACCOUNT TOTALS **

G/L ACCOUNT	NAME	AMOUNT
630 5-820-6371	UTILITIES	14.01
630 5-820-6373	TELEPHONE	932.21
630 5-820-64131	PROJECT SHARE REMITTANCE	64.00
630 5-820-6416	DUES AND ASSESSMENTS	553.86
630 5-820-64181	PROPERTY TAXES	48,133.00
630 5-820-6420	MAPPING	450.00
630 5-820-6450	OTHER CONTRACTED SERVICES	178.40
630 5-820-6456	TREE TRIMMING	18,359.50
630 5-820-6457	SAFETY TESTING	158.38
630 5-820-65061	COMPUTER SUPPLIES	4,857.50
630 5-820-6507	OPERATING SUPPLIES & MATERIALS	8.77
630 5-820-6508	POSTAGE	1,423.50
630 5-820-6512	TOOLS	23.11
630 5-820-6560	INTO INVENTORY	28,620.63
	*** FUND TOTAL ***	110,000.97

	NO	INVOICE AMOUNT	DISCOUNTS	CHECK AMOUNT
VENDOR SET: 01 BANK: 00 TOTALS:	46	176,811.51	0.00	176,811.51
BANK: 00 TOTALS:	46	176,811.51	0.00	176,811.51
REPORT TOTALS:	46	176,811.51	0.00	176,811.51

Agenda

CREDIT CARDS	7-12-22 TO 8-9-22			
PAID 8-22-22				
BRIAN WESSEL	$ 80.42	A ND A AIR CONDITIONER	ICE MACHINE	630-5-820-6506/600-5-810-6310
GABE STRICKER	$ 27.28	UPS	TESTING	630-5-820-6457
	$ 42.79	BEST BUY	CD RECORDER	630-5-820-6506
	$ 33.80	UPS	TESTING	630-5-820-6457
DOUG STUTT	$ 14.85	COMMERICAL PRINTERS	UPS SHIPPING	600-5-810-6508
JAKE ROWE	$ 15.89	ADOBE	MONTHLY FEE	630-5-820-65061
CEGAN LONG	$ 798.95	DUKE AERIAL	SKYJACK RENTAL	600-5-810-6310
	$ 54.57	THE UPS STORE	WATER SAMPLES	600-5-810-6508
	$ 10.15	UPS	WATER SAMPLES	600-5-810-6508
	$ 15.08	UPS	SOIL SAMPLES	600-5-810-6508
	$ 11.75	UPS	WATER SAMPLES	600-5-810-6508
	$ 135.00	IAMU	CLASS DISTRIBUTION AND LEAK DETECTION	600-5-810-6230
GREG O'BRIEN	$ 12.17	COMMERICAL PRINTERS	WATER SAMPLES	600-5-810-6508
	$ 1,252.70			

Agenda

QCAnalytical Services, LLC
1798 Iowa Drive, LeClaire, IA 52753 • qcanalytical.net
O: 563-289-3373 • Fx: 563-289-5526

Laboratory Report

Eldridge, City of
Cegan Long
305 North 3rd Street
Eldridge,IA 52748

Date Received: 08/25/22 11:51
Date Reported: 08/31/22 09:51
Project: PWS ID # IA8230008 Eldridge
Send Invoice to AP

Analyte	Result	Units	Analyzed	Analyst	Method	Notes
Sample ID: 120 N Scott Park Rd - Routine Grab			**Date Sampled: 08/25/22 10:15**		**Date Received: 08/25/22 11:51**	
Lab No.: 22H2518-01			**Sampled by: Eldridge Personnel**			
Classical Chemistry Parameters						
Total Coliforms	Negative	MPN/100 mL	08/25/22 11:51	ad	SM 9223B	
Field Chlorine	0.29	mg/L	08/25/22 10:15	Eldridge I	SM 4500 Cl G	

Analyte	Result	Units	Analyzed	Analyst	Method	Notes
Sample ID: 105 E LeClaire Rd - Routine Grab			**Date Sampled: 08/25/22 9:49**		**Date Received: 08/25/22 11:51**	
Lab No.: 22H2518-02			**Sampled by: Eldridge Personnel**			
Classical Chemistry Parameters						
Total Coliforms	Negative	MPN/100 mL	08/25/22 11:51	ad	SM 9223B	
Field Chlorine	3.10	mg/L	08/25/22 9:49	Eldridge I	SM 4500 Cl G	

Analyte	Result	Units	Analyzed	Analyst	Method	Notes
Sample ID: 821 W. Donahue St. - Routine Grab			**Date Sampled: 08/25/22 9:31**		**Date Received: 08/25/22 11:51**	
Lab No.: 22H2518-03			**Sampled by: Eldridge Personnel**			
Classical Chemistry Parameters						
Total Coliforms	Negative	MPN/100 mL	08/25/22 11:51	ad	SM 9223B	
Field Chlorine	3.20	mg/L	08/25/22 9:31	Eldridge I	SM 4500 Cl G	

Analyte	Result	Units	Analyzed	Analyst	Method	Notes
Sample ID: 501 W LeClaire Rd - Routine Grab			**Date Sampled: 08/25/22 9:16**		**Date Received: 08/25/22 11:51**	
Lab No.: 22H2518-04			**Sampled by: Eldridge Personnel**			
Classical Chemistry Parameters						
Total Coliforms	Negative	MPN/100 mL	08/25/22 11:51	ad	SM 9223B	

Analysis Certified by:

Randall Wanke, Ph.D.

Amy Dobbelare For Randall Wanke, Laboratory Director

Randal Wanke, Laboratory Director

IA DNR lab #113

Eldridge, City of	Project:	PWS ID # IA8230008 Eldridge	
305 North 3rd Street		Send Invoice to AP	**Reported:**
Eldridge IA, 52748	Client Contact:	Cegan Long	08/31/22 09:51

Analyte	Result	Units	Analyzed	Analyst	Method	Notes
Field Chlorine	3.02	mg/L	08/25/22 9:16	Eldridge I	SM 4500 Cl G	

Sample ID: 305 N 3rd St - Routine Grab **Date Sampled: 08/25/22 8:58** **Date Received: 08/25/22 11:51**
Lab No.: 22H2518-05 **Sampled by: Cegan Long**

Classical Chemistry Parameters

Analyte	Result	Units	Analyzed	Analyst	Method	Notes
Total Coliforms	Negative	MPN/100 mL	08/25/22 11:51	ad	SM 9223B	
Field Chlorine	2.94	mg/L	08/25/22 8:58	Cegan Lc	SM 4500 Cl G	

Sample ID: 2199 E. Lomar St. - Routine Grab **Date Sampled: 08/24/22 12:52** **Date Received: 08/25/22 11:51**
Lab No.: 22H2518-06 **Sampled by: Cegan Long**

Classical Chemistry Parameters

Analyte	Result	Units	Analyzed	Analyst	Method	Notes
Total Coliforms	Negative	MPN/100 mL	08/25/22 11:51	ad	SM 9223B	
Field Chlorine	1.45	mg/L	08/24/22 12:52	Cegan Lc	SM 4500 Cl G	

Sample ID: 800 Rustic View Ct. - Routine Grab **Date Sampled: 08/24/22 12:25** **Date Received: 08/25/22 11:51**
Lab No.: 22H2518-07 **Sampled by: Cegan Long**

Classical Chemistry Parameters

Analyte	Result	Units	Analyzed	Analyst	Method	Notes
Total Coliforms	Negative	MPN/100 mL	08/25/22 11:51	ad	SM 9223B	
Field Chlorine	1.20	mg/L	08/24/22 12:25	Cegan Lc	SM 4500 Cl G	

Sample ID: 914 W. Hickory St - Routine Grab **Date Sampled: 08/24/22 12:02** **Date Received: 08/25/22 11:51**
Lab No.: 22H2518-08 **Sampled by: Cegan Long**

Classical Chemistry Parameters

Analyte	Result	Units	Analyzed	Analyst	Method	Notes
Total Coliforms	Negative	MPN/100 mL	08/25/22 11:51	ad	SM 9223B	
Field Chlorine	3.20	mg/L	08/24/22 12:02	Cegan Lc	SM 4500 Cl G	

N-1 Negative
A Bacteria Absent

Exhibit 1 – Soil Test Results
Eldridge, IA
Tested: 8/8 & 8/18, 2022, P. Hanson

No.	Location	Resistivity ohm-cm	Redox mV	pH	Sulfides	Soil Description
*1	**3223 S. 26th Avenue**	1,280	+175	6.5	Negative	Brown silty clay with trace gravel, saturated as received
*2	**2951 S. 1st Avenue**	880	+285	6.5	Negative	Brown silty clay, saturated as received
*3	**1700 E. Blackhawk Trail**	1,320	+305	5.5	Negative	Brown & gray silty clay, saturated as received
*4	**2900 S. Scott Park Road**	1,360	+275	6.6	Negative	Brown silty clay, saturated as received
*5	**121 S. 14th Avenue**	920	-50	6.9	Positive	Brown & dark gray silty clay, moist as received

* Potentially corrosive to iron pipe

Agenda

Ductile Iron Pipe
Research Association

Strength and Durability for Life®

CORROSION CONTROL

Polyethylene Encasement

Last Revised:
January 2017

Throughout more than 58 years of service in thousands of utilities in the United States and across the world, polyethylene encasement has proved an effective corrosion-protection system for millions of feet of Cast and Ductile Iron Pipe. V-Bio® Enhanced Polyethylene Encasement builds upon this proven method of corrosion control and provides the most advanced corrosion protection for Ductile Iron Pipe while still maintaining the ease of use we have come to expect from polyethylene encasement.

Polyethylene encasement involves simply wrapping the pipe with a tube or sheet of polyethylene immediately before installing the pipe. It is easy for construction crews to install on-site and is by far the most economical way to protect Ductile Iron Pipe. And, unlike cathodic protection systems and bonded coatings, polyethylene encasement is a passive protection system, so it requires no monitoring, maintenance, or supervision once installed.

This brochure will briefly present the history and development of polyethylene encasement, explain how it protects Ductile Iron Pipe, and highlight field investigations across the nation. It will also discuss polyethylene's advantages over other corrosion-protection methods, explain how to ascertain if protection is warranted, outline proper installation procedures, and briefly review cost considerations when choosing a corrosion-protection system for Ductile Iron Pipe.

History and Development

Polyethylene encasement was first used experimentally in 1951 by the Cast Iron Pipe Research Association (CIPRA)* and one of its member companies to protect a mechanical joint pipe assembly in a highly corrosive cinder fill in Birmingham, Alabama. When examined two years later, the unprotected parts of the pipe showed significant pitting due to corrosion. The glands, nuts, bolts, and portion of the pipe protected by polyethylene encasement were in excellent condition.

Also in the early 1950s, CIPRA began an ongoing testing program, burying bare and polyethylene-encased Cast Iron pipe specimens in highly corrosive muck in the Florida Everglades and later in a tidal salt marsh in Atlantic City, New Jersey. The success of these early installations led to the development of an extensive, ongoing research program that determined polyethylene encasement's efficacy in providing a high degree of corrosion protection for Cast and Ductile Iron Pipe in most soil environments.

By the late 1950s, successful results in CIPRA's research program led to the first use of polyethylene encasement in operating water systems in Lafourche Parish, Louisiana, and Philadelphia, Pennsylvania. And, in 1963, CIPRA continued its research with the burial of polyethylene-encased Ductile Iron Pipe specimens in test sites in the Everglades and Wisconsin Rapids, Wisconsin. Millions of feet of polyethylene-encased Cast and Ductile Iron Pipe have since been installed in thousands of operating water systems across the United States and throughout the world.

Due to polyethylene encasement's excellent success in actual field conditions, the first national standard, ANSI/AWWA C105/A21.5, was adopted in 1972. The American Society for Testing and Materials issued a standard for polyethylene (ASTM A674) in 1974. In 1981, Great Britain adopted a national standard. National and industry standards in several other countries followed. An international standard for polyethylene sleeving (ISO 8180) was adopted in 1985.

*The Cast Iron Pipe Research Association (CIPRA) became the Ductile Iron Pipe Research Association (DIPRA) in 1979.

Although most soil environments are not considered corrosive to Ductile Iron Pipe, soils in landfill sites such as the one pictured here are generally considered corrosive. Other typically corrosive environments include swamps, peat bogs, expansive clays, and alkali soils.

The material requirement called for in AWWA C105 Standard when it was issued in 1972 was 8-mil, low-density (LD) polyethylene. With the 1993 revision to this standard, the section on materials was expanded to include 4-mil, high-density, cross-laminated (HDCL) polyethylene.

HDCL polyethylene was first installed on an operating pipeline in Aurora, Colorado, in 1981. In 1982, DIPRA began investigating the corrosion protection afforded Ductile Iron Pipe by 4-mil HDCL polyethylene encasement at its Logandale, Nevada, test site. During the 1993 revision of AWWA C105, the A21 Committee reviewed the test data on 4-mil HDCL polyethylene and concluded that from all indications, it provided comparable protection of Ductile Iron Pipe to that afforded by the standard 8-mil LD polyethylene. Based on that conclusion, the A21 Committee elected to incorporate the 4-mil HDCL polyethylene into the standard.

With the 1993 revision of the standard, the section on materials was also updated to include Class B (colored) polyethylene to allow for color coding of potable/reclaimed/wastewater pipelines as required by many local/state regulatory agencies.

The 1999 revision of AWWA C105 included: (1) the deletion of 8-mil LD polyethylene film, (2) the addition of 8-mil linear low-density (LLD) polyethylene film, and (3) the addition of impact, tear-resistant and marking requirements for both materials (LLD and HDCL). The revision benefitted the user by reflecting an improved polyethylene material.

Since the standard was first published in 1972, the polyethylene film industry has made a number of technological advances. The LD film, which continues to serve the industry well, had become more difficult to obtain. Newer materials, such as LLD film, which replaced the LD film, are readily available, much stronger, and more resistant to damage. The material requirements for the LLD film were closely patterned after the Australian Standard for Polyethylene Sleeving for Ductile Iron Pipelines (AS 3680) where the material has been in use for several years.

Laboratory tests indicate that the 4-mil HDCL and the 8-mil LLD polyethylene may be more resistant to construction damage than the old 8-mil LD polyethylene. Tensile strength, impact strength and puncture resistance of the 4-mil HDCL and the 8-mil LLD polyethylene are typically greater because of inherent differences in the materials. Based on DIPRA's laboratory and field research, either the 8-mil LLD or the 4-mil HDCL polyethylene material is recommended in accordance with AWWA C105 Standard for corrosion protection of Ductile Iron Pipe in aggressive environments.

Standards for Polyethylene Encasement	
ANSI/AWWA C105/A21.5: United States	1972
ASTM A674: United States	1974
JDPA Z 2005: Japan	1975
BS6076: Great Britain	1981
ISO 8180: International	1985
DIN 30 674, Part 5: Republic of Germany	1985
A.S. 3680 and A.S. 3681: Australia	1989

How Polyethylene Encasement Protects Ductile Iron Pipe

At the trench, crew members encase Ductile Iron Pipe with a tube or sheet of polyethylene immediately before installing the pipe. The polyethylene acts as an unbonded film, which prevents direct contact of the pipe with the corrosive soil. It also effectively reduces the electrolyte available to support corrosion activity to any moisture that might be present in the thin annular space between the pipe and the polyethylene film.

Typically, some groundwater will seep beneath the wrap. Although the entrapped water initially has the corrosive characteris- tics of the surrounding soil, the available dissolved oxygen supply beneath the wrap is soon depleted and the oxidation process stops long before any damage occurs. The water enters a state of stagnant equilibrium, and a uniform environment exists around the pipe.

The polyethylene film also retards the diffusion of additional dissolved oxygen to the pipe surface and the migration of cor- rosion products away from the pipe surface.

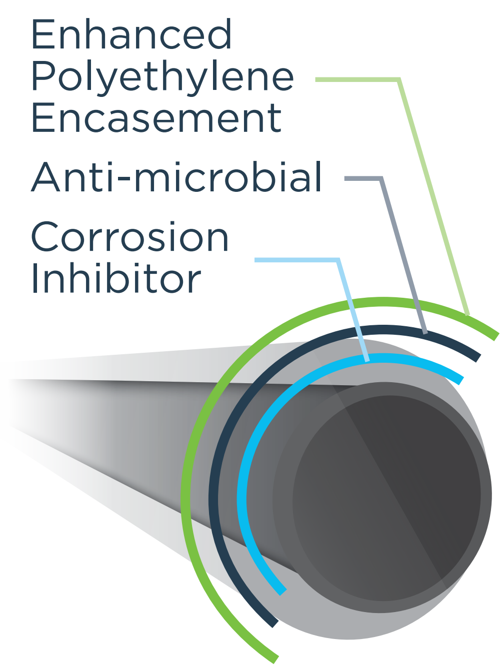
Polyethylene encasement is not designed to be a watertight system. Yet, once installed, the weight of the earth backfill and surrounding soil prevents any significant exchange of groundwater between the wrap and the pipe.

As with any corrosion-protection system, proper installation is important to polyethylene encasement's success. Polyethylene encasement should be carefully installed following one of three installation methods outlined in ANSI/AWWA C105/A21.5.

How V-Bio® Enhanced Polyethylene Encasement Protects Ductile Iron Pipe

V-Bio® Enhanced Polyethylene Encasement

The development of V-Bio® Enhanced Polyethylene Encasement began in 2002 and the first installations for field testing were at DIPRA test sites in 2014. The goal of V-Bio® Enhanced Polyethylene Encasement was to address two concerns that had been raised over the years with the use of polyethylene encasement; the potential influence of anaerobic bacteria through micro-biologically influenced corrosion (MIC) and the possibility of corrosion occurring under intact polywrap.



V-Bio Enhanced Polyethylene Encasement consists of three layers of co-extruded linear low density polyethylene (LLDPE) film that are fused into one. The inner layer that will be in contact with the pipe is infused with a proprietary blend of an anti-microbial additive to mitigate MIC and a volatile corrosion inhibitor (VCI) to control galvanic corrosion underneath the wrap. V-Bio® Enhanced Polyethylene Encasement protects against corrosion without involving the consumption of either the anti-microbial or the volatile corrosion inhibitor, meaning its enhanced properties will not wear out.

V-Bio® Enhanced Polyethylene Encasement follows and meets all requirements of the AWWA C105 standard. It is installed the same way using the same methods as regular polyethylene encasement and as with any protective measure proper installation is vital to its success. With V-Bio® Enhanced Polyethylene Encasement it is essential to maintain intimate contact of the encasement to the pipe to optimize the performance of the infused additives.

Advantages of Polyethylene Encasement

Polyethylene's excellent dielectric properties enable it to effectively shield the pipe from low-level stray direct current. Also, because polyethylene provides a uniform environment for the pipe underneath the wrap, local galvanic corrosion cells are virtually eliminated as the oxygen is consumed. With the use of V-Bio® Enhanced Polyethylene Encasement galvanic corrosion cells are non-existent thanks to the corrosion inhibitor infused into the inner layer.

Pinholes in the loose wrapping material do not significantly diminish its protective ability. And, unlike bonded coatings, polyethylene has the ability to protect the pipe without the formation of concentration cells at coating holidays.

Polyethylene encasement is easy to install and requires no additional manpower or special equipment. Construction crew members simply slip the polyethylene over the pipe as they install it.

Compared to cathodic protection and bonded coatings, polyethylene and V-Bio® Enhanced Polyethylene Encasement is very inexpensive. The initial cost of material and installation is very low — only pennies per foot in most sizes. In fact, many utilities that install their own pipe assign no installation cost for the encasement, reporting that the material costs as little as a few cents per inch- diameter per foot for polyethylene encasement.

Both Polyethylene and V-Bio® Enhanced Polyethylene Encasement is are field- applied, so the pipe doesn't require special handling or packaging during shipment. And, because installation is on site, damage is less likely than on factory-applied coatings. If damaged, the polyethylene encasement is easy and simple to repair at the job site with polyethylene compatible adhesive tape.

Because polyethylene is a passive system of protection, it requires no expensive maintenance or monitoring and costs nothing to operate once installed

Polyethylene Encasement

- Is inexpensive.
- Is easy to install.
- Requires no additional manpower.
- Requires no maintenance or monitoring.
- Costs nothing to operate.
- Doesn't deteriorate underground.
- Is easily repaired with polyethylene adhesive tape if damaged.
- Doesn't require any special handling or packaging during shipment.
- V-Bio® Enhanced Polyethylene Encasement eliminates galvanic corrosion cells.
- Protects the pipe without the formation of concentration cells at coating holidays.

How to Identify Corrosive Environments

It is important to identify potentially corrosive environments prior to pipeline installation because, once a pipeline is installed, it is both costly and difficult to retrofit with corrosion protection measures.

Although Ductile Iron Pipe possesses good resistance to corrosion and needs no additional protection in most soils, experience has shown that external corrosion protection is warranted in certain soil environments. Examples include soils with low resistivities, anaerobic bacteria, differences in composition, and differential aeration around the pipe. Dissimilar metals and external stray direct currents may also necessitate additional corrosion protection.

Soils contaminated by coal mine wastes, cinders, refuse, or salts also are generally considered corrosive. So are certain naturally occurring environments, such as swamps, peat bogs, expansive clays, and alkali soils. And soils in wet, low-lying areas are generally considered more corrosive than those in well-drained areas.

Previously the 10 point soil evaluation procedure was recommended for identifying corrosive environments but it has been replaced with The Design Decision Model™. The DDM™ was developed jointly between DIPRA and Corrpro. It builds upon the proven 10 point system to provide the most accurate soil evaluation for Ductile Iron Pipe possible.

10-Point Soil Evaluation Procedure

Although several evaluation procedures have been used to predict conditions corrosive to underground piping, the 10-point soil evaluation procedure instituted by CIPRA in 1964 is most often recommended for Ductile Iron Pipe. Included in the Appendix to the ANSI/AWWA C105/A21.5 Standard, the 10-point system has proved invaluable in surveying more than 100 million feet of proposed pipeline installations to determine soil corrosivity.

The evaluation procedure is based upon information drawn from five tests and observations:

- Soil resistivity
- pH
- Oxidation-reduction (redox) potential
- Sulfides
- Moisture

For a given soil sample, each parameter is evaluated and assigned points according to its contribution to corrosivity. The points for all five areas are totaled, and if the sum is 10 or more, the soil is considered corrosive to Ductile Iron Pipe, and protective measures should be taken.

In addition, potential for stray direct current corrosion should also be considered as part of the evaluation. Notes on previous experience with underground structures in the area are also very important in predicting soil corrosivity.

It is important to note that the 10-point system, like any evaluation procedure, is intended as a guide in determining a soil's potential to corrode Ductile Iron Pipe. It should be used only by qualified engineers or technicians experienced in soil analysis and evaluation.

Soil Test Evaluation for Ductile Iron Pipe

(10-Point System)*

Soil Characteristics	Points
Resistivity (ohm-cm)**	
<1,500	10
≥1,500–1,800	8
>1,800—2,100	5
>2,100—2,500	2
>2,500—3,000	1
>3,000	0
pH	
0–2	5
2–4	3
4–6.5	0
6.5–7.5	0***
7.5–8.5	0
>8.5	3
Redox Potential	
> + 100 mv	0
+50 to +100 mv	3.5
0 to +50 mv	4
Negative	5
Sulfides	
Positive	3.5
Trace	2
Negative	0
Moisture	
Poor drainage, continuously wet	2
Fair drainage, generally moist	1
Good drainage, generally dry	0

*Ten points–corrosive to Ductile Iron Pipe. Protection is indicated.

**Based on water-saturated soil box. This method is designed to obtain the lowest–and most accurate–resistivity reading.

***If sulfides are present and low (<100 mv) or negative redox-potential results are obtained, 3 points should be given for this range.

Note: DIPRA recommends that the soil sample used in the 10-point evaluation be taken at pipe depth rather than at the surface. Soil corrosivity readings can vary substantially from the surface to pipe depth.

The Design Decision Model™

The DDM™ is a risk matrix concept that incorporates an evaluation of the likelihood of corrosion along a proposed Ductile Iron Pipeline route and the consequences that may result from a corrosionrelated problem. In this way, a utility is provided with a recommendation for corrosion control that is best suited for the particular installation under design. Recommendations range from simply installing the Ductile Iron Pipe as-manufactured with its protective standard shop coating and annealing oxide layer, to encasing the pipe in polyethylene, to providing cathodic protection currents to control the rate of corrosion.

Likelihood Factors

Using the 10-Point System as described in Appendix A of ANSI/AWWA C105/A21.51 as a basis, the DDM™ evaluates the following factors in determining the likelihood that corrosion could be a problem for a proposed Ductile Iron Pipeline:

- Resistivity
- Sulfides
- Moisture Content
- Redox Potential
- Ground Water Influence
- Bi-metallic Considerations
- pH
- Known Corrosive Environments
- Chlorides

Of the above, resistivity, pH, redox, sulfides, and moisture content are criteria that carry over from the 10-Point Soil Evaluation System that the Ductile Iron Pipe industry has used for decades. For a discussion of the importance of these factors in contribution to a corrosion cell, please refer to Appendix A of ANSI/AWWA C105/A21.5.

Figure 1 shows that the recommendations for corrosion control result from obtaining a point count for both Likelihood and Consequence Factors. Entering the graph at the appropriate points, a color-coded intersection is found that establishes the appropriate corrosion mitigation recommendation. As enumerated in Figure 1, the methods include:

1. Installing the pipe as-manufactured with its protective standard shop coating/annealing oxide system.
2. Encasing the pipe in polyethylene.
3. Encasing the pipe in polyethylene or encasing the pipe and providing bonded joints.
4. Encasing the pipe in polyethylene and providing bonded joints or providing life-extension cathodic protection currents, with or without encasement.
5. Cathodic protection.

Consequence Factors

Consequence factors relate to operational reliability and the difficulties that may exist in affecting a repair to a Ductile Iron Pipeline. The following core factors are used to establish those consequences:

- The diameter of the pipe.
- The location of the pipe.
- The depth of cover.
- Whether an alternative supply of water is available.

These factors are used to evaluate access to the pipe at a particular location and the relative difficulty in affecting repairs. Access can be categorized as good, with minimal traffic considerations, typical excavation depths, the availability of an alternative supply of water, etc., or increasingly more difficult where depth of cover, right-of-way considerations, utility congestion, or unstable soil conditions may have an impact on repair efforts.

MERRITT ISLAND, FL

27 Years

24-inch Cast Iron pipe encased in loose 8-mil polyethylene.
Installed 1963. Inspected 1990.
Soil Analysis:
- Description: Gray and black loamy sand.
- Resistivity: 1,120 ohm-cm (10)*
- pH: 7.1 (3)
- Redox: -20 mv (5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (23.5)
Condition of Pipe and Encasement: Excellent

WATERFORD, MI

20 Years

8-inch Ductile Iron Pipe encased in loose 8-mil polyethylene
Installed 1975. Inspected 1995.
Soil Analysis:
- Description: Black and gray silty clay
- Resistivity: 960 ohm-cm (10)
- pH: 7.5 (3)
- Redox: +23 mv (3.5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (22)
Condition of Pipe and Encasement:Excellent

PHILADELPHIA, PA

30 Years

12-inch Cast Iron Pipe encased in loose 8-mil polyethylene.
Installed 1959. Inspected 1989.
Soil Analysis:
- Description: Landfill area-brownish red clayey silts and dark gray organic clays with organic materials and petroleum and paper wastes
- Resistivity: 2,400 to 5,600 ohm-cm (2)
- pH: 3.9 to 6.2 (3)
- Redox: +67 to +69 mv (3.5)
- Sulfides: Positive (3.5)
- Moisture: Moist to saturated (2)

Soil Condition: Corrosive (14)
Condition of Pipe and Encasement: Very good

OGDEN, UT

10 Years

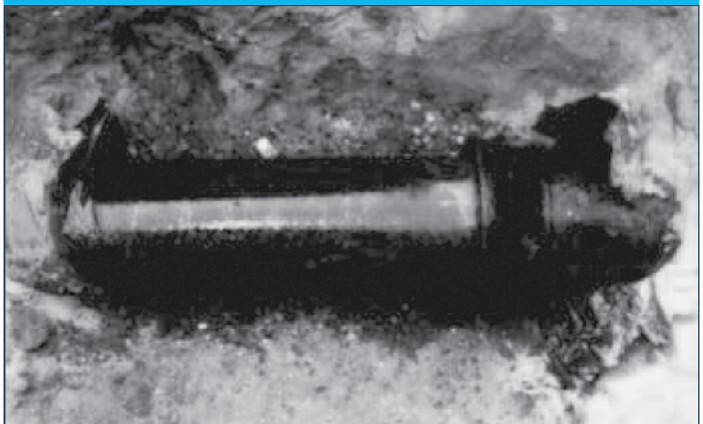
16-inch Ductile Iron Pipe encased in loose 8-mil polyethylene
Installed 1979. Inspected 1989.
Soil Analysis:
- Description: Dark gray silty clay
- Resistivity: 192 ohm-cm (10)
- pH: 7.9 (0)
- Redox: -165 mv (5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (20.5)
Condition of Pipe and Encasement: Excellent

*Numbers in parentheses indicate point count per Soil Test Evaluation procedure outlined in Appendix A of ANSI/AWWA C105/A21.5. See table on page 7 of this brochure for explanation.

MITCHELL, SD

18 Years



12-inch Cast Iron pipe encased in loose 8-mil polyethylene.
Installed 1963. Inspected 1981.
Soil Analysis:
- Description: Brown clay and sand with cinders present.
- Resistivity: 840 ohm-cm (10)
- pH: 7.1 (0)
- Redox: +450 mv (0)
- Sulfides: Trace (2)
- Moisture: Moist (1)

Soil Condition: Corrosive (13)
Condition of Pipe and Encasement: Excellent

DETROIT, MI

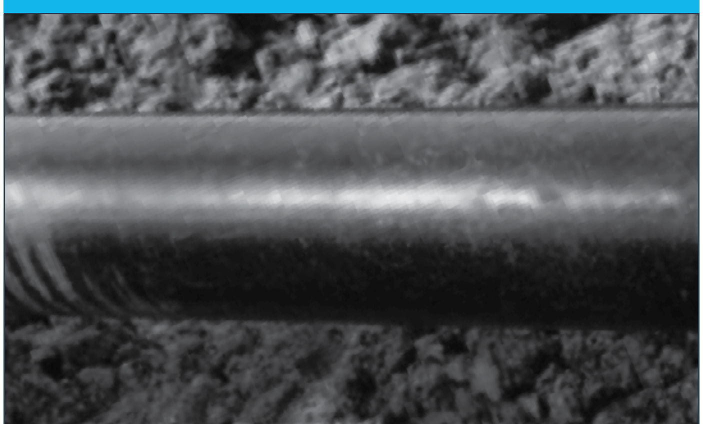
21 Years

8-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1974. Inspected 1995.
Soil Analysis:
- Description: Gray and black silty clay
- Resistivity: 1,320 ohm-cm (10)
- pH: 7.4 (3)
- Redox: -113 mv (5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (23.5)
Condition of Pipe and Encasement: Excellent

OMAHA, NE

15 Years



12-inch Cast Iron pipe encased in loose 8-mil polyethylene.
Installed 1974. Inspected 1989.
Soil Analysis:
- Description: Gray clay
- Resistivity: 600 ohm-cm (10)*
- pH: 7.4 (3)
- Redox: +90 mv (3.5)
- Sulfides: positive (3.5)
- Moisture: Wet (2)

Soil Condition: Corrosive (22)
Condition of Pipe and Encasement: Excellent

CHARLESTON, SC

21 Years

24-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1967. Inspected 1988.
Soil Analysis:
- Description: Gray sand and clay with organic muck in reclaimed marsh subjected to fluctuating water table due to coastal tidal effect.
- Resistivity: 560 ohm-cm (10)
- pH: 6.9 (3)
- Redox: -132 mv (5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (23.5)
Condition of Pipe and Encasement: Excellent

*Numbers in parentheses indicate point count per Soil Test Evaluation procedure outlined in Appendix A of ANSI/AWWA C105/A21.5. See table on page 7 of this brochure for explanation.

SYRACUSE, NY

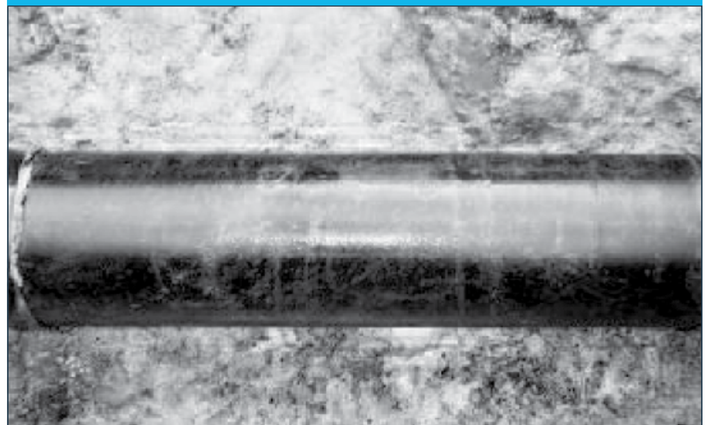
15 Years

8-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1988. Inspected 2003.
Soil Analysis:
- Description: Dark, organic brown clay
- Resistivity: 410 ohm-cm (10)
- pH: 6.9 (3)
- Redox: -40 mv (5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (23.5)
Condition of Pipe and Encasement: Excellent

FAYETTEVILLE, AR

30 Years



12-inch Gray Iron pipe encased in loose 8-mil polyethylene
Installed 1973. Inspected 2003.
Soil Analysis:
- Description: Dark gray clay
- Resistivity: 1,600 ohm-cm (8)
- pH: 6.8 (3)
- Redox: -100 mv (5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (21.5)
Condition of Pipe and Encasement: Excellent

JACKSON, MS

9 Years

8-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1977. Inspected 1986.
Soil Analysis:
- Description: Mixture of organic clay and brown silty clay
- Resistivity: 880 ohm-cm (10)
- pH: 4.4 (0)
- Redox: -150 mv (5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (20.5)
Condition of Pipe and Encasement: Excellent

LITTLE ROCK, AR

14 Years

30-inch Ductile Iron Pipe encased in loose 8-mil polyethylene
Installed 1972. Inspected 1986.
Soil Analysis:
- Description: Dark reddish and grayish brown clay
- Resistivity: 600 ohm-cm (10)
- pH: 6.9 (3)
- Redox: +40 mv (4)
- Sulfides: Trace (2)
- Moisture: Saturated (2)

Soil Condition: Corrosive (21)
Condition of Pipe and Encasement: Excellent

*Numbers in parentheses indicate point count per Soil Test Evaluation procedure outlined in Appendix A of ANSI/AWWA C105/A21.5. See table on page 7 of this brochure for explanation.

MONTGOMERY, AL

20 Years

36-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1982. Inspected 2002.
Soil Analysis:
- Description: Reddish brown clayey sand
- Resistivity: 172 ohm-cm (10)*
- pH: 8.7 (3)
- Redox: +30 mv (4)
- Sulfides: Negative (0)
- Moisture: Saturated (2)

Soil Condition: Corrosive (19)
Condition of Pipe and Encasement: Excellent

LAFOURCHE PARISH, LA

40 Years

4-inch Cast Iron pipe encased in loose 8-mil polyethylene.
Installed 1958. Inspected 1998.
Soil Analysis:
- Description: Gray clay with black organics
- Resistivity: 520 ohm-cm (10)
- pH: 6.3 (0)
- Redox: -50 mv (5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (20.5)
Condition of Pipe and Encasement: Excellent

LATHAM, NY

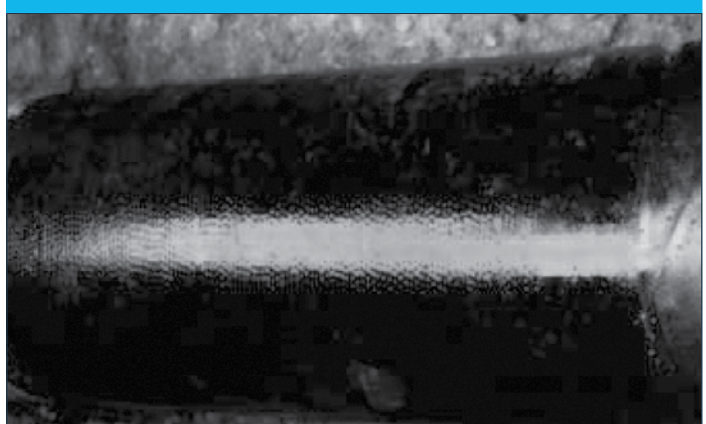
36 Years

6-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1962. Inspected 1998.
Soil Analysis:
- Description: Dark brown stiff clay
- Resistivity: 600 ohm-cm (10)
- pH: 7.1 (0)
- Redox: +200 mv (0)
- Sulfides: Negative (0)
- Moisture: Saturated (2)

Soil Condition: Corrosive (12)
Condition of Pipe and Encasement: Excellent

ST. GEORGE, UT

16 Years



12-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1968. Inspected 1984.
Soil Analysis:
- Description: Dark gray clayey silt
- Resistivity: 720 ohm-cm (10)
- pH: 7.3 (0)
- Redox: +110 mv (0)
- Sulfides: Negative (0)
- Moisture: Saturated (2)

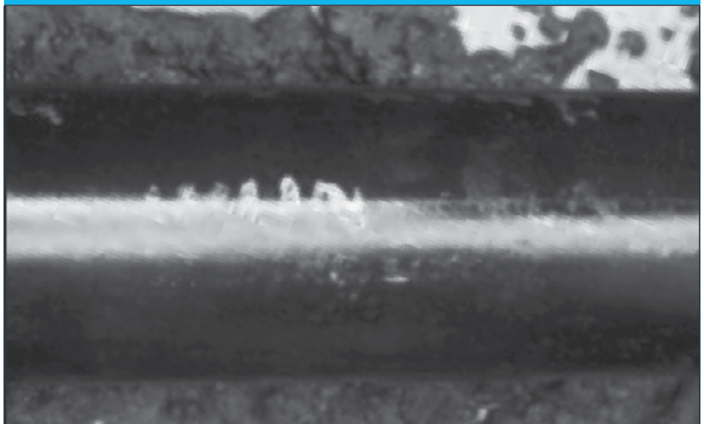
Soil Condition: Corrosive (12)
Condition of Pipe and Encasement: Excellent

*Numbers in parentheses indicate point count per Soil Test Evaluation procedure outlined in Appendix A of ANSI/AWWA C105/A21.5. See table on page 7 of this brochure for explanation.

Agenda

CITY OF ORANGE, CA

18 Years



6-inch Cast Iron pipe encased in loose 8-mil polyethylene.
Installed 1969. Inspected 1987.
Soil Analysis:
- Description: Brown silty clay
- Resistivity: 640 ohm-cm (10)
- pH: 6.3 (0)
- Redox: +170 mv (0)
- Sulfides: Negative (0)
- Moisture: Saturated (2)

Soil Condition: Corrosive (12)
Condition of Pipe and Encasement: Excellent

ST. LOUIS, MO

13 Years

12-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1973. Inspected 1986.
Soil Analysis:
- Description: Sticky gray-brown clay
- Resistivity: 600 ohm-cm (10)
- pH: 6.7 (0)
- Redox: +150 mv (0)
- Sulfides: Negative (0)
- Moisture: Moist (1)

Soil Condition: Corrosive (11)
Condition of Pipe and Encasement: Excellent

NANTICOKE, ON, CANADA

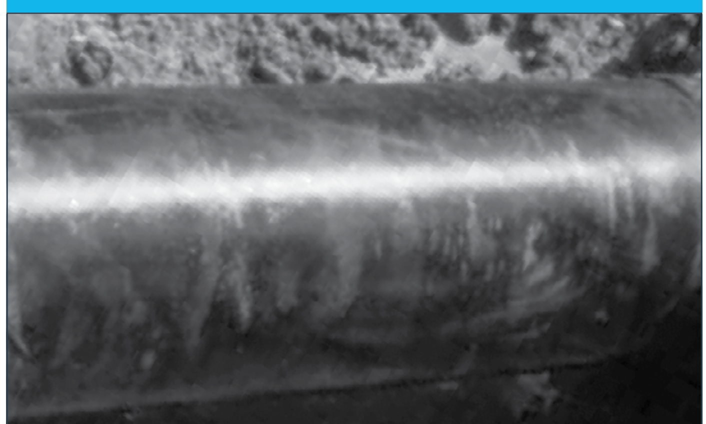
16 Years

16-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1977. Inspected 1993.
Soil Analysis:
- Description: Brown, gray, and black silty clay
- Resistivity: 960 ohm-cm (10)
- pH: 7.3 (3)
- Redox: -18 mv (5)
- Sulfides: Positive (3.5)
- Moisture: Saturated (2)

Soil Condition: Corrosive (23.5)
Condition of Pipe and Encasement: Very good

FARMINGTON/SHIPROCK, NM

20 Years



16-inch Ductile Iron Pipe encased in loose 8-mil polyethylene.
Installed 1968. Inspected 1988.
Soil Analysis:
- Description: Light brown clayey silt with some gravel and rock
- Resistivity: 400 ohm-cm (10)
- pH: 7.7 (0)
- Redox: +146 mv (0)
- Sulfides: Trace (2)
- Moisture: Saturated (2)

Soil Condition: Corrosive (14)
Condition of Pipe and Encasement: Excellent

*Numbers in parentheses indicate point count per Soil Test Evaluation procedure outlined in Appendix A of ANSI/AWWA C105/A21.5.
See table on page 7 of this brochure for explanation.

Proper Installation of Polyethylene Encasement

As with any corrosion-protection system, proper installation is important to polyethylene encasement's success. Care taken during installation is as important as the installation method itself. The few known failures of polyethylene-encased Cast and Ductile Iron Pipe have generally been due to improper installation or poor workmanship. The ANSI/AWWA C105/A21.5 Standard outlines three methods of installing polyethylene sleeving. Methods A and B use polyethylene tubes, and Method C uses polyethylene sheets. Method A uses one length of polyethylene tube, overlapped at the joints, for each length of pipe. Because installation is faster and easier, most utilities and contractors choose some form of Method A. Method B uses a length of polyethylene tube for the barrel of the pipe and a separate length of polyethylene tube or sheet for the joints. The national standard does not recommend Method B for bolted-type joints unless an additional layer of polyethylene is provided over the joint area as in Methods A and C. In Method C, each section of pipe is completely wrapped with a flat polyethylene sheet.

ANSI/AWWA C105/A21.5 Installation Methods

Method A

In this method, which is preferred by most utilities and contractors, one length of polyethylene tube, overlapped at the joints, is used for each length of pipe.

Method B

A length of polyethylene tube is used for the barrel of the pipe and separate length of polyethylene tube or sheets are used for the joints. Note: Method B is not recommended for bolted type joints unless additional layer of polyethylene is provided over the joint area as in Methods A and C.

Method C

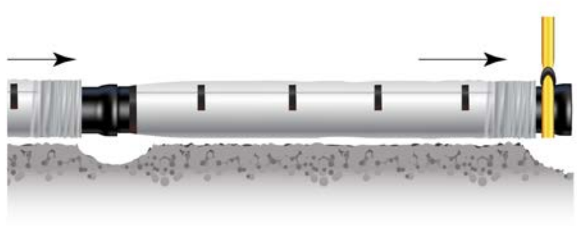
Each section of pipe is completely wrapped with a flat polyethylene sheet.

Modified Method A for Normal Dry Trench Conditions

Step 1
Cut a section of polyethylene tube approximately two feet longer than the pipe section. Remove all lumps of clay, mud, cinders, or other material that might have accumulated on the pipe surface during storage. Slip the polyethylene tube around the pipe, starting at the spigot end. Bunch the tube accordion-fashion on the end of the pipe. Pull back the overhanging end of the tube until it clears the pipe end.

Step 2
Take up slack in the tube along the barrel of the pipe to make a snug, but not tight, fit. Fold excess polyethylene back over the top of the pipe.

Step 3
Dig a shallow bell hole in the trench bottom at the joint location to facilitate installation of the polyethylene tube. Lower the pipe into the trench and make up the pipe joint with the preceding section of pipe.



Step 4
Move the cable to the bell end of the pipe and lift the pipe slightly to provide enough clearance to easily slide the tube. Spread the tube over the entire barrel of the pipe. Note: Make sure that no dirt or other bedding material becomes trapped between the wrap and the pipe.

Step 5
Make the overlap of the polyethylene tube by pulling back the bunched polyethylene from the preceding length of pipe and securing it in place. Note: The polyethylene may be secured in place by using tape or plastic tie straps.

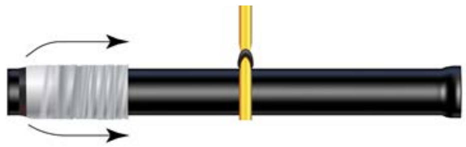
Step 6
Overlap the secured tube end with the tube end of the new pipe section. Secure the new tube end in place.

Step 7
Repair all small rips, tears, or other tube damage with adhesive tape. If the polyethylene is badly damaged, repair the damaged area with a sheet of polyethylene and seal the edges of the repair with adhesive tape.

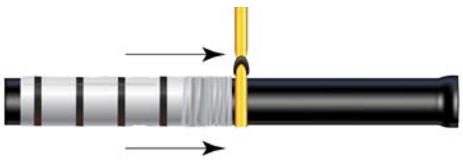
Step 8
Carefully backfill the trench according to the procedures in AWWA C600 Standard. To prevent damage during backfilling, allow adequate slack in the tube at the joint. Backfill should be free of cinders, rocks, boulders, nails, sticks, or other materials that might damage the polyethylene. Avoid damaging the polyethylene when using tamping devices.

Alternate Method A for Wet Trench Conditions

In wet, sloppy trench conditions, the pipe should be completely covered by the polyethylene tube before it is lowered in to the trench. This alternate method is illustrated below.

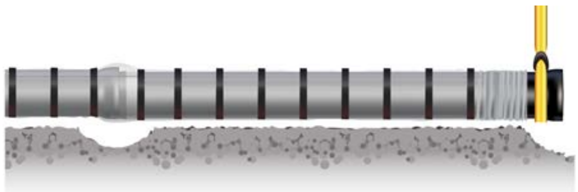


Step 1
Cut the polyethylene tube to a length approximately two feet longer than that of the pipe section. Slip the tube over the pipe.



Step 2
Spread the tube over the entire barrel of the pipe, pushing back both ends of the tube until they clear both pipe ends. Make sure the tube is entered on the pipe to provide a one-foot overlap each end.

Step 3
Take up slack in the tube to make a snug, but not tight, fit. (see previous page.) Circumferential wraps of tape or plastic tie straps should be placed at 2-foot intervals along the barrel of the pipe to help minimize the space between the polyethylene and the pipe. Wrap a piece of tape or plastic tie strap completely around the pipe at each end to seal the polyethylene, leaving ends free to overlap the adjoining sections of pipe.



Step 4: Lower pipe into the trench and make up the pipe joint. Be careful not to damage the polyethylene when handling or jointing the pipe. Complete the installation following dry condition Steps 4,5 (taking care to seal ends of overlap by wrapping tape or plastic tie straps completely around the pipe at each end), 8, and 9 on previous page. **Note: When lifting polyethylene-encased pipe, use a fabric-type sling or suitable padded cable or chain to prevent damage to the polyethylene.**

If you have any problems or questions about installing polyethylene encasement, contact DIPRA or one of its member companies.

Appurtenances

Pipe-Shaped Appurtenances
Cover bends, reducers, offsets, and other pipe-shaped appurtenances in the same manner as the pipe.

Odd-Shaped Appurtenances
Wrap odd-shaped appurtenances such as valves, tees, and crosses with a flat sheet or split length of polyethylene tube by passing the sheet under and then over the appurtenance and bringing it together around the body of the appurtenance. Make seams by bringing the edges of the polyethylene together, folding over twice, and taping them down.

Joints
Overlap joints as in normal installation; then tape the polyethylene securely in place at valve stems and other penetrations. When bolted-type joints are used, care should always be taken to prevent bolts or other sharp edges of the joint configuration from penetrating the wrap.

Branches, Blowoffs, Air Valves
To provide openings for branches, blowoffs, air valves, and similar appurtenances, make an X-shaped cut in the polyethylene and temporarily fold back the film. After installing the appurtenance, tape the slack securely to the appurtenance and repair the cut and any other damaged areas in the polyethylene with tape.

Service Taps
The preferred method of tapping polyethylene-encased Ductile Iron Pipe involves wrapping two or three layers of polyethylene adhesive tape completely around the pipe to cover the area where the tapping machine and chain will be mounted. Then install the corporation stop directly through the tape and polyethylene. After the tap is made inspect the entire circumferential area for damage and make any necessary repairs.

Recommended Tapping Method

To perform the preferred method of tapping polyethylene-encased Ductile Iron Pipe, wrap two or three layers of polyethylene-compatible adhesive tape completely around the pipe to cover the area where the tapping machine and chain will be mounted.

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Mount the tapping machine on the pipe area covered by the polyethylene tape. Then make the tap and install the corporation stop directly through the tape and polyethylene.

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After making the direct service connection, inspect the entire circumferential area for damage and make any necessary repairs.

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Tips for Proper Installation

1. Quality of installation is more important than the actual sequence followed.
2. Don't leave the polyethylene outside in the sun for long periods before installation.
3. When lifting polyethylene-encased pipe with a backhoe, use a fabric-type "sling" or padded cable to protect the polyethylene.
4. Be sure to remove all lumps of clay, mud, cinders, etc., on the pipe surface before you encase the pipe.
5. Take care to keep soil or bedding material from becoming trapped between the pipe and the polyethylene.
6. When installing polyethylene encasement below the water table or in areas subject to tidal action, seal as thoroughly as possible both ends of each polyethylene tube with polyethylene adhesive tape or plastic tie straps at the joint overlap. Additionally, place circumferential wraps of tape or plastic tie straps at 2-foot intervals along the barrel of the pipe to help minimize the space between the polyethylene and the pipe.

Recommended Polyethylene Tube and Sheet Sizes for Ductile Iron Pipe

Nominal Pipe Diameter (in).	Minimum Polyethylene Width (in.)	
	Flat Tube	Sheet
3	14	28
4	14	28
6	16	32
8	20	40
10	24	48
12	27	54
14	30	60
16	34	68
18	37	74
20	41	82
24	54	108
30	67	134
36	81	162
42	81	162
48	95	190
54	108	216
60	108	216
64	121	242

Cost Considerations

Polyethylene encasement is more cost effective when compared to alternative corrosion-control systems like bonded coatings and cathodic protection.

According to costs outlined in a 1985 U.S. Army Corps of Engineers Technical Report, installing a 16-mil thick coating of coal tar epoxy is five times the cost of installing polyethylene encasement. And, this figure doesn't include the additional costs of packaging, handling, transportation, and inspection.

Compared to polyethylene encasement, cathodic protection is very expensive to install. According to the same Corps of Engineers' report, the cost to install an impressed-current cathodic protection system on 12-inch Ductile Iron Pipe is five times the cost of polyethylene encasement. The cost to install a sacrificial-anode system is approximately 30 times the cost of polyethylene. These figures don't include the ongoing maintenance expense required by both systems, which, over the life of the systems, are often much greater than initial design and installation costs.

Conclusion

There is no perfect system of corrosion protection for buried metallic pipelines. Failures have been documented with all types of corrosion-protection systems, including cathodic protection. Cathodic protection is very expensive to install and maintain and can also damage nearby pipelines through stray current interference. Bonded coatings are also expensive. Plus, they can be easily damaged during shipping, handling, and installation and are costly and difficult to repair in the field.

Polyethylene encasement also has limitations — and it is not universally applicable for all Ductile Iron Pipelines where corrosion protection is warranted. There are instances where it is not feasible to install polyethylene encasement due to unusual construction conditions. Additionally, in certain high-density stray current environments and in a “uniquely severe environment,” as defined in Appendix “A” of ANSI/AWWA C105/A21.5, the sleeving alone might not provide the degree of protection needed. In such cases, DIPRA sometimes recommends alternative methods of corrosion protection. And, as with all corrosion control methods, the success of polyethylene encasement is dependent upon proper installation procedures.

Since the early 1950s, DIPRA has researched numerous methods of corrosion protection for Gray and Ductile Iron Pipe, including hundreds of investigations in the laboratory, in field test sites, and in operating water systems throughout the United States. New types of polyethylene, various external pipe coatings, and the use of select backfill have also been investigated. More than 58 years of experience have demonstrated polyethylene encasement’s effectiveness in protecting Cast and Ductile Iron Pipe in a broad range of soil conditions. Properly installed polyethylene encasement can effectively eliminate the vast majority of corrosion problems encountered by most utilities. Based on numerous laboratory and field test results, DIPRA continues to recommend polyethylene encasement as the most economical and effective method of protecting Ductile Iron Pipe in most corrosive environments.

For Further Information

- American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems. ANSI/AWWA C105/A21.5- 99. American Water Works Association, Denver, Colorado.
- John C. Anderson, Polyethylene Encasement for Protection of Ductile Iron Pipe in Corrosive Environments, Ductile Iron Pipe Research Association, Birmingham, Alabama.
- A. Michael Horton, “Protecting Pipe With Polyethylene Encasement,” 1951- 1988, Waterworld News, May/June 1988, pp. 26-28.
- Andrew B. Malizio, “Pipe Digs Show Effectiveness of Poly Sheet Encasement,” Water Engineering & Management, October 1986.
- Troy F. Stroud, “Corrosion Control Methods for Ductile Iron Pipe,” Waterworld News, July/August 1989, American Water Works Association, Denver, Colorado.
- Troy F. Stroud, “Corrosion Control Measures For Ductile Iron Pipe,” Paper No. 585, National Association of Corrosion Engineers Corrosion 89 Conference, New Orleans, Louisiana, April 18, 1989.
- Troy F. Stroud, “Polyethylene Encasement versus Cathodic Protection: A View on Corrosion Protection,” Ductile Iron Pipe News, Spring/Summer 1988, pp. 8-11.
- Ernest F. Wagner, “Loose Plastic Film Wrap as Cast-Iron Pipe Protection,” Journal American Works Association Vol. 56, No. 3, March 1964.
- T.M. Walski, “Cost of Water Distribution System Infrastructure Rehabilitation, Repair, and Replacement,” Technical Report EL-85-5. U.S. Army Corps of Engineers, Department of the Army, Washington, D.C., March 1985.
- W. Harry Smith, “Corrosion Prevention with Loose Polyethylene Encasement,” Water & Sewage Works, May 1982.
- L. Gregg Horn, “The Design Decision Model™ For Corrosion Control of Ductile Iron Pipeline,” Ductile Iron Pipe Research Association, Birmingham, AL.

For more information contact DIPRA or any of its member companies.

Ductile Iron Pipe Research Association

An association of quality producers dedicated to the highest pipe standards through a program of continuing research and service to water and wastewater professionals.

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1757 Burlington Street East
Hamilton, Ontario L8N 3R5 Canada

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Coshocton, Ohio 43812-6001

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Birmingham, Alabama 35244

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Agenda

To: Utility Board
From: Jacob Rowe
Re: Employee Handbook
Date: 9/1/22

The Utility Board and City Council requested that staff seek assistance in updating the employee handbook. It was also requested that we partner with a human resource firm to help with any future HR needs. We have received three estimates that would meet that goal.

MRG Management Resource Group

- Handbook fees, $8,000
- 1.5 - 2 hrs. of handbook training, $3,000
- No estimate for future HR assistance

Califf & Harper (City Labor Attorney)

- Handbook Fees, $3,000
- No estimate for future HR assistance

MRA The Management Association

- Handbook Fees (Member), $2,520 - $3,080
- Handbook Fees (Non-Member) $3,330 – $4,070
- Annual Membership $1,150

Tony and I feel that partnering with MRA as a member would be a great asset to both the City and Utility. We would recommend that the cost be split 50/50 between the City and Utility Board.

Agenda

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2/2022

Agenda

2022 Annual Membership Rates

Employees	Rate
2 - 50 employees	$900
51 - 100 employees	$1,150
101 - 150 employees	$1,925
151 - 250 employees	$2,075
251 - 500 employees	$3,350
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751 - 999 employees	$4,600
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