RECEIVED
FEB 26 2021
PUBLIC SERVICE COMMISSION

LG&E
a PPL company

Linda C. Bridwell
Executive Director
Kentucky Public Service Commission
211 Sower Boulevard
Frankfort, Kentucky 40601-8294

Louisville Gas and Electric Company
State Regulation and Rates
220 West Main Street
P.O. Box 32010
Louisville, Kentucky 40232
www.lge-ku.com

Rick E. Lovekamp
Manager Regulatory Strategy/Policy
T 502-627-3780
rick.lovekamp@lge-ku.com

February 26, 2021

RE: ***Louisville Gas and Electric Company Alleged Failure to Comply with KRS 278.495, 807 KAR 5:022, and 49 C.F.R. Part 192***
Case No. 2017-00119

Dear Ms. Bridwell:

In accordance with the Kentucky Public Service Commission's Order of March 16, 2018, Ordering Paragraph No. 4 in Case No. 2017-00119, Louisville Gas and Electric Company submitted the 2020 Annual Report on January 29, 2021. Attached is Exhibit E that relates to a distribution coupling removed from the ground that was noted as item number 5 of the 2020 Annual Report. This report was not available at the time of submitting the 2020 Annual Report.

The original will be filed with the Commission within 30 days of the lifting of the state of emergency.

Should you have any questions regarding the enclosed, please contact me at your convenience.

Sincerely,

Rick E. Lovekamp

IMR TEST LABS
A Curtiss-Wright Business Unit
www.imrlouisville.com

4510 Robards Lane
Louisville, KY 40218
T: 1.502.810.9007 | **F**: 1.502.810.0380

LG&E - Kentucky Utilities
6900 Enterprise Drive
Louisville, KY 40214

February 1, 2021

Attention: Sarah Nicholson

Exhibit E

Report No. 202100071

Metallurgical Evaluation of an 16" Coupling and Associated Hardware

Location: River Rd. & E. Witherspoon Rd.

DESCRIPTION AND PURPOSE

A natural gas pipe section including a coupling was submitted for metallurgical evaluation. The section was a 16” pipe with a Dresser Style Insulating Coupling. Six joint harnesses were also affixed to the pipe section. Copies of the installation information for the coupling and harnesses were provided for this investigation. It was reported that the coupling had been installed in the field at the corner of River Rd. and E. Witherspoon Rd. on June 4, 1990. The pipe section was subsequently excavated after substantial service duration without failure. It was requested that the general dimensions, weld quality, corrosion condition and mechanical properties of the coupling components be determined as directed.

RESULTS

The submitted pipe section with the coupling is shown in Figures 1 through 4. Three lugs of the joint harnesses had been fillet welded to both pipe segments. Six rods and associated nuts had been affixed through the welded lugs to apply compression to the coupled joint. The coupling consisted of a steel coupling with an interior nonmetallic gasket / sleeve. Prior to receipt, the ends of the pipe segment were labelled as Ends A and B, as shown in Figures 1 through 4. The top and bottom of the coupling section were also marked. Lugs A1, A2, A3, A4, A5, and A6 were welded to Pipe A, and Lugs B1, B2, B3, B4, B5, and B6 were welded to Pipe B. The rod between Lugs A1 and B1 was identified as Rod 1. The remaining lugs were identified in a corresponding fashion.

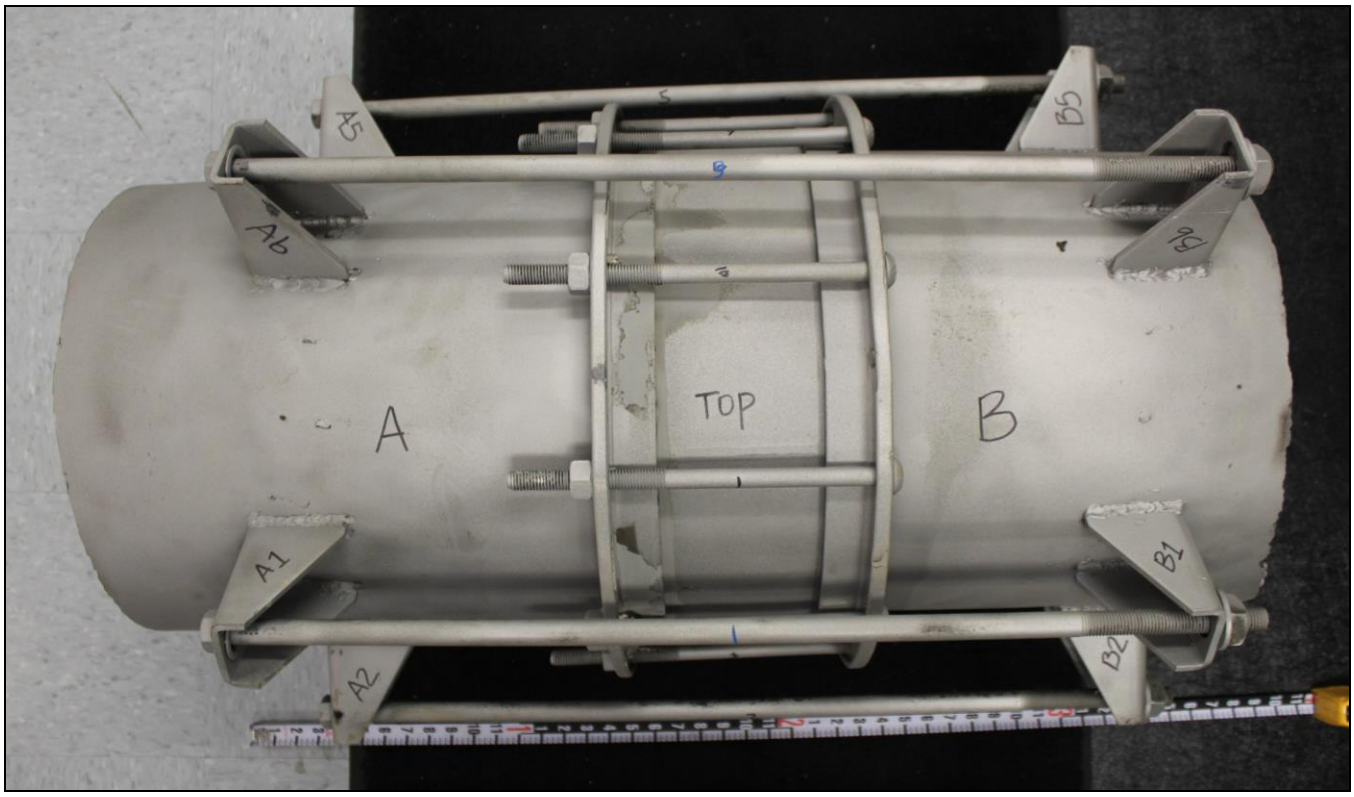


Figure 1. Photograph of the top of the submitted coupling sample.

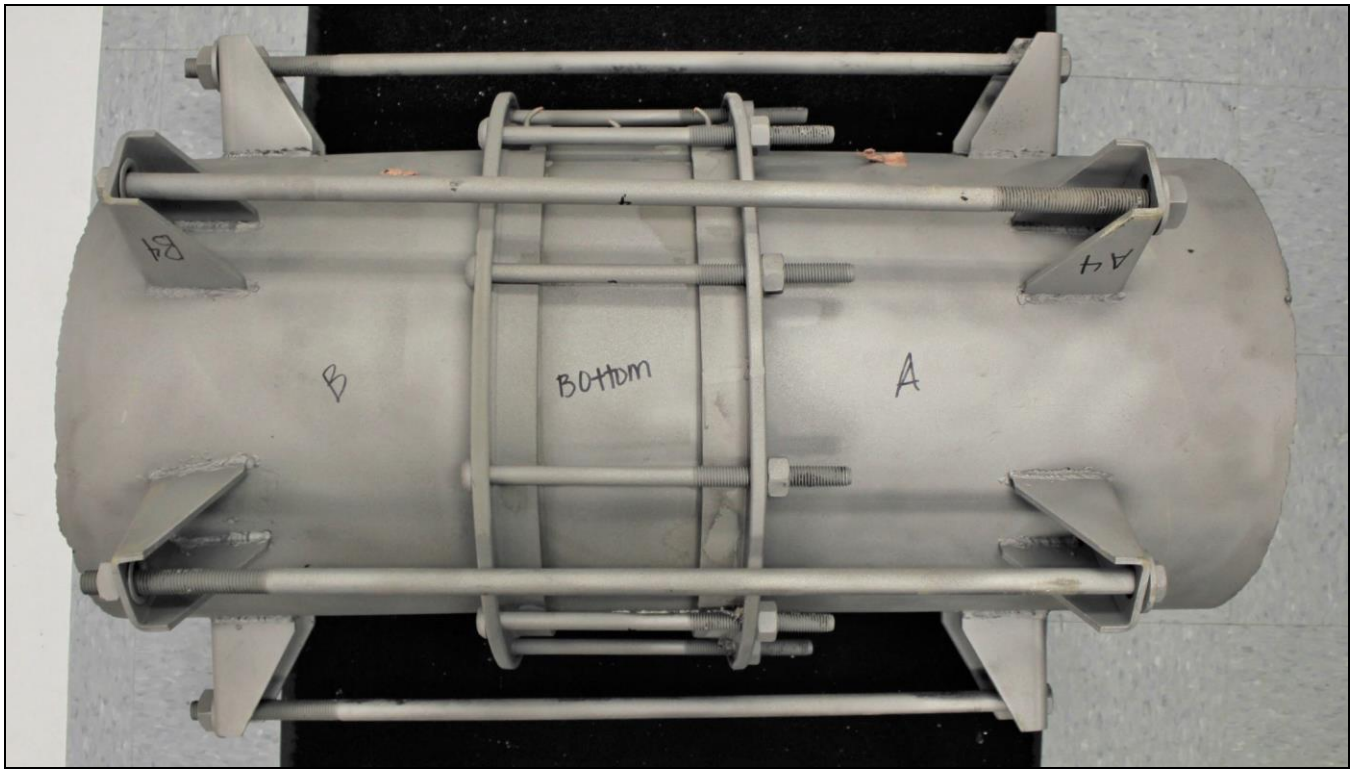


Figure 2. Photograph of the bottom of the submitted sample.

SECTION 1- DIMENSIONAL MEASUREMENT

The six sets of harness lugs were positioned around the pipe. The relative orientations of the harness lugs were measured by photographing the assembly from the ends and applying a protractor overlay for angle measurement. The obtained measurements are shown in Figures 3 and 4 with the data summarized in Table 1. The depth of insertion of the pipe segments into the coupling was also measured and the dimensions are provided in Table 2. No requirements were provided for these characteristics.

TABLE 1 – LUG SPACING DIMENSIONAL MEASUREMENTS

Compound	Angle	Deviation from 60°	Image
Rod A1 / Rod A2	55	5	Figure 3
Rod A2 / Rod A3	57	3	Figure 3
Rod A3 / Rod A4	59	1	Figure 3
Rod A4 / Rod A5	53	7	Figure 3
Rod A5 / Rod A6	64	4	Figure 3
Rod A6 / Rod A1	72	12	Figure 3
Rod B1 / Rod B2	65	5	Figure 4
Rod B2 / Rod B3	53	7	Figure 4
Rod B3 / Rod B4	60	0	Figure 4
Rod B4 / Rod B5	61	1	Figure 4
Rod B5 / Rod B6	50	10	Figure 4
Rod B6 / Rod B1	71	11	Figure 4

TABLE 2 – PIPE COUPLING DIMENSIONAL MEASUREMENTS

Component	Depth of Pipe into Coupling	Gap Between Pipes in Coupling
Pipe A	4”	1/4” (Original sample length – 37.5”)
Pipe B	4”	

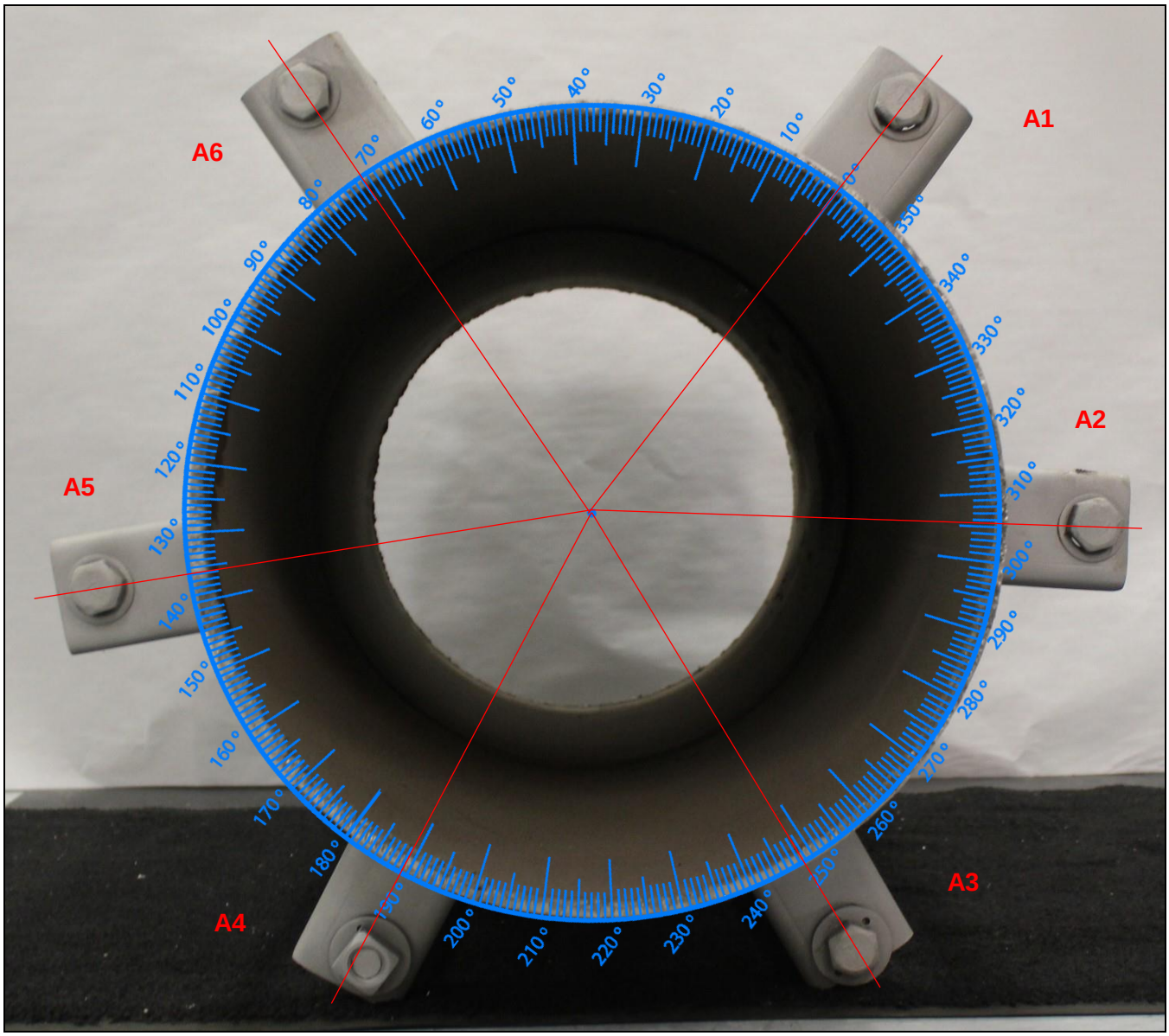


Figure 3. End facing image of the sample at End A with a superimposed protractor.

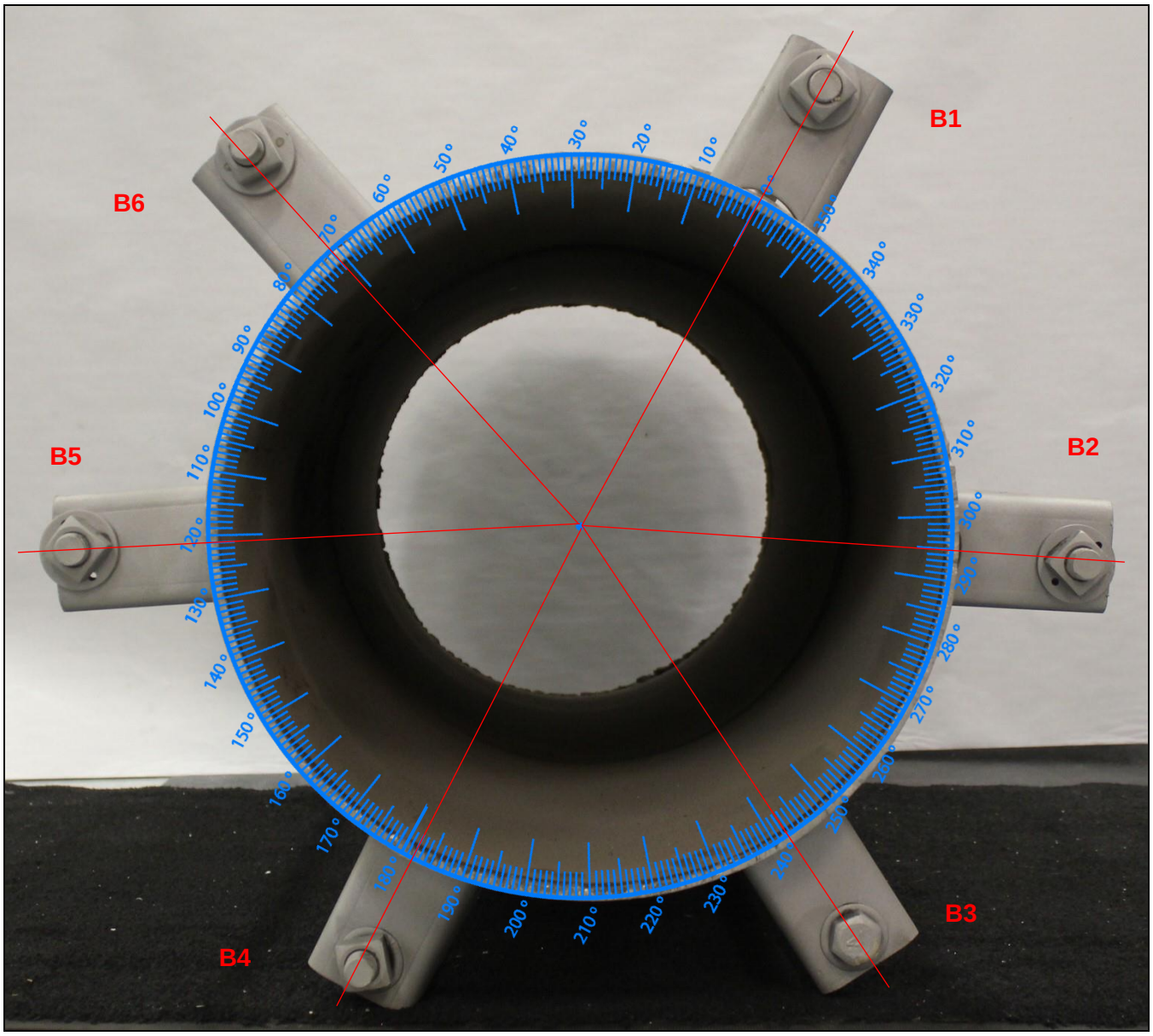


Figure 4. End facing image of the sample at End B with a superimposed protractor.

SECTION 2- VISUAL OBSERVATIONS

The lug attachment welds were regions of interest on the pipe coupling sample. Each lug contained four fillet weld locations; exterior top, exterior bottom, interior top, and interior bottom. Each weld that was present was inspected visually using a flashlight and magnifying lens. It was indicated that welding was performed in accordance with API 1104. General weld inspection was performed initially, followed by visual inspection by an outside NDE company. For comparison purposes, the welds were rated as substantial fusion, partial fusion, and minimal fusion. The summarized weld fusion and corrosion observations are provided in Table 3. Representative weld regions are shown in Figures 5 through 12. The welds contained localized weld discontinuities including undercut, arc strikes, porosity, and spatter.

No cracking in the welds or base metal heat affected zones (HAZ) was visually identified. No gross corrosion was observed anywhere on the pipe or associated hardware.

The coupling and harness rods were also inspected for damage. The observations for the rods and bolts are provided in Table 4. No corrosion cracking was evident. The rods were not necked down or stretched.

The elastomeric components of the coupling consisted of a pipe separator, insulating sleeve, and two gaskets. Inspection revealed that they appeared to be intact and not degraded.

TABLE 3 – LUG WELD VISUAL EXAMINATION RESULTS

Component	Location	Weld	Observations
Lug A1	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug A2	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug A3	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug A4	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug A5	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion

Lug A6	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug B1	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug B2	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug B3	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug B4	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug B5	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion
Lug B6	Exterior	Top	Substantial Fusion
		Bottom	Substantial Fusion
	Interior	Top	Substantial Fusion
		Bottom	Substantial Fusion

TABLE 4 – FASTENER VISUAL EXAMINATION RESULTS

Component	Observations
Rod 1	Not bent or stretched, no gross corrosion, did not rotate freely
Rod 2	Not bent or stretched, no gross corrosion, did not rotate freely
Rod 3	Not bent or stretched, no gross corrosion, did not rotate freely
Rod 4	Not bent or stretched, no gross corrosion, did not rotate freely
Rod 5	Not bent or stretched, no gross corrosion, did not rotate freely
Rod 6	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 1	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 2	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 3	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 4	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 5	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 6	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 7	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 8	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 9	Not bent or stretched, no gross corrosion, did not rotate freely
Bolt 10	Not bent or stretched, no gross corrosion, did not rotate freely

Figure 5. Image of the Lug A1 exterior top weld which exhibited substantial fusion except for some undercut and arc strikes.

Figure 6. Image of the Lug A3 exterior top weld which exhibited substantial fusion except for some undercut and porosity.

Figure 7. Image of the Lug A4 exterior bottom weld which exhibited substantial fusion.

Figure 8. Image of the Lug A5 exterior bottom weld which exhibited substantial fusion except for some undercut and porosity.

Figure 9. Image of the Lug A6 exterior top and interior bottom welds which exhibited substantial fusion except for some undercut, arc strikes, and porosity.

Figure 10. Image of the Lug B1 exterior top weld which exhibited substantial fusion except for arc strikes, undercut, and spatter.

Figure 11. Image of the Lug B3 exterior bottom weld which exhibited substantial fusion except for arc strikes, porosity, and spatter.

Figure 12. Image of the Lug B5 interior bottom weld which exhibited substantial fusion except for arc strikes, porosity, and spatter.

SECTION 3- TORQUE TESTING- FOR INFORMATION ONLY

Torque testing was performed on the nuts of the rods and bolts on the pipe coupling sample. A calibrated torque wrench was used to determine breakaway torque on each fastener. The breakaway torque measurements are summarized in Table 5. Rod fasteners did not have a specified torque requirement. The ten coupling bolts and six harness rods exhibited torque values ranging from 45 to >140 ft.-lbs. Rods 4, 5, and 6 rotated when torque was applied to the nuts. No requirements were utilized for comparison as the coupler model was not specified.

TABLE 5 – FASTENER TORQUE MEASUREMENT

Component	Breakaway Torque	Observations
Rod 1	>140	No breakaway
Rod 2	45	
Rod 3	65	
Rod 4	Rotated under torque	
Rod 5	Rotated under torque	
Rod 6	Rotated under torque	
Bolt 1	65	
Bolt 2	>140	No breakaway
Bolt 3	90	
Bolt 4	>140	No breakaway
Bolt 5	85	
Bolt 6	80	
Bolt 7	120	
Bolt 8	80	
Bolt 9	90	
Bolt 10	>140	No breakaway

SECTION 4- TENSILE TESTING, ASTM A370-19

Tensile testing was performed on round specimens that were removed from the six harness rods and the ten coupling bolts. The tensile mechanical properties of the fasteners were measured and the results are summarized in Table 6. No mechanical property requirements were provided for the fasteners. Tensile testing was performed at an accredited sister laboratory.

TABLE 6 – FASTENER TENSION TEST RESULTS

Component ①	Ultimate Tensile Strength, ksi	0.2% Offset Yield Strength, ksi	Elongation, %②	Reduction in Area, %
Rod 1	118	66.0	20	48
Rod 2	119	66.5	20	45
Rod 3	126	70.5	19	47
Rod 4	126	72.0	19	43
Rod 5③	118	65.0	21	51
Rod 6	120	65.5	19	46
Bolt 1	71.5	55.0	36	73
Bolt 2	69.0	53.0	37	74
Bolt 3	71.5	54.0	36	73
Bolt 4	70.0	51.5	37	72
Bolt 5	71.5	54.5	36	72
Bolt 6	65.0	47.9	39	75
Bolt 7	70.5	52.5	36	71
Bolt 8	72.0	55.0	36	73
Bolt 9	72.0	55.5	34	73
Bolt 10	72.0	54.0	36	71

① Specimen Dimensions; Diameter 0.25” with gage length of 1.00”
② Percent elongation was measured using elongation-after-fracture measurements
③ Specimen fractured outside the middle half of the marked gage

SECTION 5- ROCKWELL HARDNESS, ASTM E18-20

Small sections of the twelve lugs were excised for hardness testing. Rockwell hardness testing was performed on sectioned segments of the lugs after the removal of surface roughness by sanding. The obtained results are provided in Table 7 and are suggestive of a moderate strength level. No requirements were provided for comparison. Hardness testing was performed at an accredited sister laboratory.

TABLE 7 – LUG HARDNESS TEST RESULTS – ROCKWELL B – HRBW

Results	Average①
Lug A1	77
Lug A2	48
Lug A3	73
Lug A4	76
Lug A5	68
Lug A6	75
Lug B1	87
Lug B2	74
Lug B3	76
Lug B4	65
Lug B5	76
Lug B6	72

① Measured hardness is an average of three individual readings

SECTION 6- NONDESTRUCTIVE EXAMINATION

The two separated ends of the disassembled coupling were sent to a third party NDE laboratory for inspection. Visual and liquid dye penetrant inspections were performed on the lug attachment welds. Inspection was performed in accordance with the acceptance criteria of API 1104 “Welding of Pipelines and Related Facilities”. The inspection results are provided as Appendix A. Two representative welds are shown in Figures 13 and 14 with the dye penetrant test media remaining.

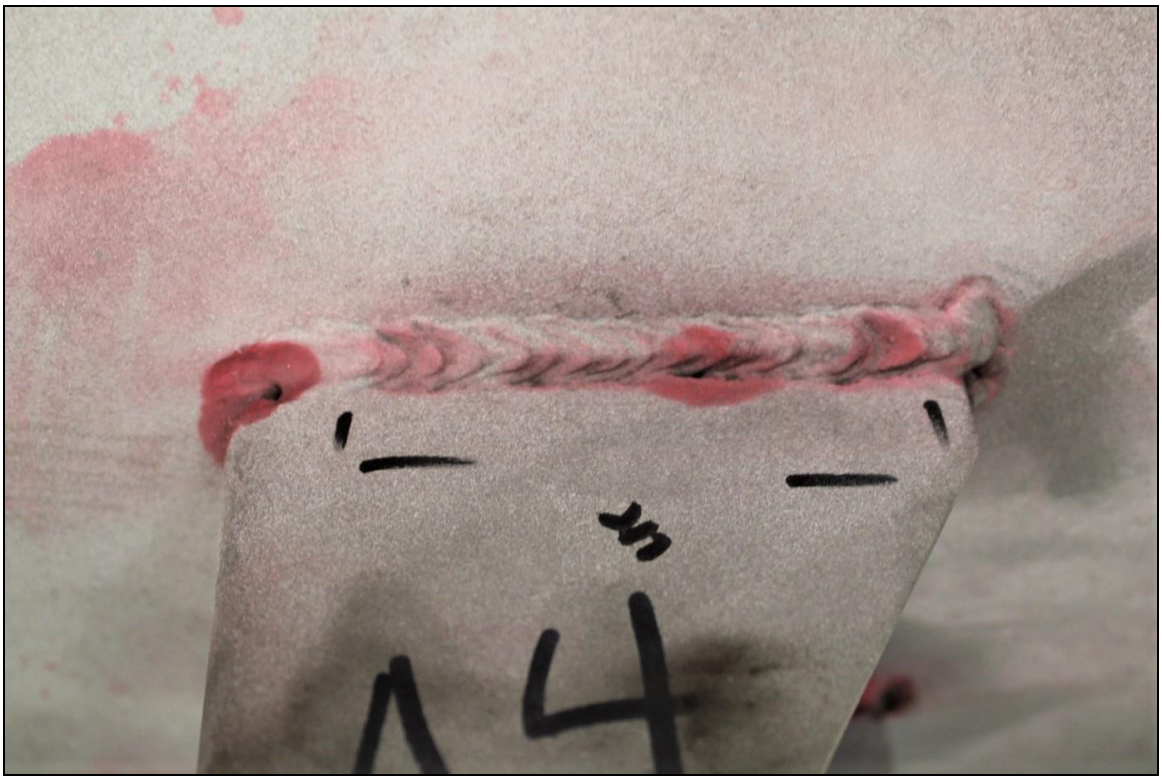


Figure 13. Image of the Lug A4 exterior top weld after dye penetrant media had been used during inspection.

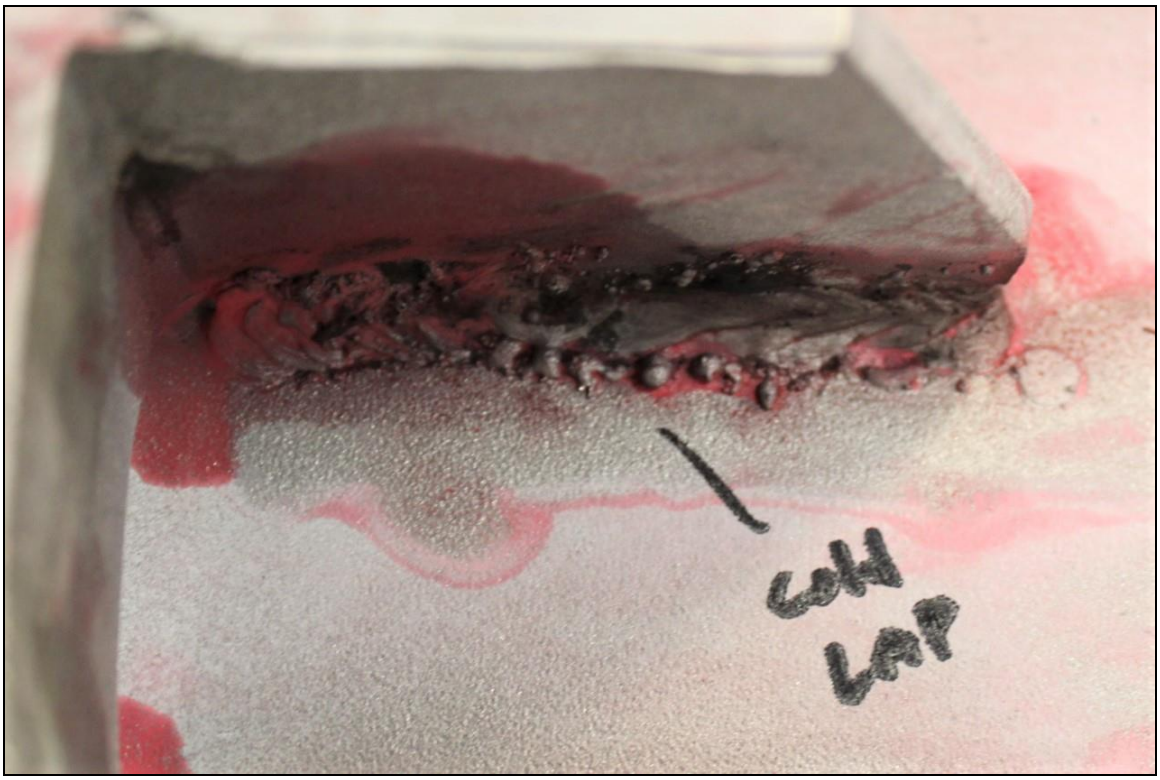


Figure 14. Image of the Lug B6 interior top weld after dye penetrant media had been used during inspection. A cold lap was identified.

Respectfully submitted

Brian Kelly
Failure Analyst

Concurrence

Brett A. Miller, P.E. FASM
Technical Director

All procedures were performed in accordance with the IMR Quality Manual, current revision, and related procedures; and the PWA MCL Manual F-23 and related procedures. The information contained in this test report represents only the material tested and may not be reproduced, except in full, without the written approval of IMR Test Labs ("IMR"). IMR maintains a quality system in compliance with the ISO/IEC 17025 and is accredited by A2LA, certificates #1140.03 and #1140.04. IMR will perform all testing in good faith using the proper procedures, trained personnel, and equipment to accomplish the testing required. Conformance will be based on results without measurement uncertainty applied, unless otherwise requested by the customer. IMR's liability to the customer or any third party is limited at all times to the amount charged for the services provided. All test samples will be retained for a minimum of 3 months and may be destroyed thereafter, unless otherwise specified by the customer. The recording of false, fictitious, or fraudulent statements or entries on this document may be punished as a felony under federal statutes. IMR Test Labs is a GEAE S-400 approved lab (Supplier Code T9334).

APPENDIX A – LIQUID DYE PENETRANT / VISUAL INSPECTION RECORD

MISTRAS

Liquid Penetrant Examination Report

195 Clarksville Road | Princeton Junction, NJ 08550 | P: (609) 716-4000; F: (609) 716-4145 www.mistrasgroup.com

Client:	IMR TEST LABS	Date:	1/18/2021 Page: 1 of 1
Address:	4510 ROBERTS LANE	Job Number:	
	LOUISVILLE KT40218	Purchase Order:	6800FA
Contact:		Reference Number:	202100071
Location:	MGI LAB	Part No/Description:	N/A
			16" COUPLER

Code/Specification	Procedure	Acceptance Criteria
ASME SEC V,ART 6	100-PT-001 REV 20	API 1104 20th Edition

Type and Method

☐ Fluorescent: [Type I] ☐ Water Wash [Method A] ☒ Solvent Removable [Method C] ☐ Post Emulsified: ☐ Hydrophilic [D] ☐ Lipophilic [B]

☒ Red Visible Dye: [Type II] ☐ Water Wash [Method A] ☒ Solvent Removable [Method C] ☐ Post Emulsified [Method B]

Sensitivity Level: ☐ ½ ☐ 1 ☒ 2 ☐ 3 ☐ 4 ☐ N/A ☐ Other: N/A

	Manufacturer	Type	Batch Number(s)	Application Method	Process Time (minutes)	
					Pre-clean Dry Time:	15 MIN
Cleaner:	MAGNAFLUX	SKC-S	18G14K	SPRAY/CLOTH	Penetrant Dwell Time:	10 MIN
Penetrant:	MAGNAFLUX	SKL-SP2	17L02K	BRUSH	Emulsifier Time:	N/A
Developer:	MAGNAFLUX	SKD-S2	17J05K	SPRAY	Developer Time:	10 MIN
Emulsifier:	N/A	N/A	N/A	N/A	Post Clean Method:	N/A

Developer Form: ☐ a. Dry Powder ☐ b. Water Soluble ☐ c. Water Suspended ☒ d. Nonaqueous Wet ☐ e. Specific Application

Penetrant Removal Method & Dry Time	Black Light (Model and S/N)	White Light Source
DAMP CLOTH/10MIN	N/A	L.E.D

☒ Original ☐ Repair	Material & Thickness	Test Temperature
	C/S (.250")	72 F

Surface Condition

☒ As Welded ☐ As Ground ☐ As Cast ☐ Rough Machined ☐ Final Machined ☐ Meets Code Requirements

Test Results	Quantity Inspected: 12	Quantity Accepted:	Quantity Rejected: 12

SIDE A
A-1- REJECTED FOR UNDERCUT AND PIN HOLE POROSITY
A-2- REJECTED FOR UNDERCUT AND PIN HOLE POROSITY
A-3- REJECTED FOR UNDERCUT AND PIN HOLE POROSITY
A-4- REJECTED FOR UNDERCUT AND PIN HOLE POROSITY
A-5- REJECTED FOR PIN HOLE POROSITY
A-6- REJECTED FOR CRACK

SIDE B
B-1- REJECTED FOR POROSITY
B-2- REJECTED FOR PIN HOLE POROSITY
B-3- REJECTED FOR UNDERCUT
B-4- REJECTED FOR UNDERCUT
B-5- REJECTED FOR PIN HOLE POROSITY
B-6- REJECTED FOR CRACK

Technician Name, Level & Date	Customer (if applicable):	Reviewed By (if applicable):
BRADLEY TIPTON LEVEL II 1-18-21		

Certification of Inspection, Liquid Penetrant [Basic Report Form] 100-PTFORM-002 | Rev 1

MISTRAS

Visual Examination Report

195 Clarksville Road | Princeton Junction, NJ 08550 | P: (609) 716-4000; F: (609) 716-4145 www.mistrasgroup.com

1. Client	2. Work Location	4. Mistras Job No.	6. Date	7. Page
IMR Test Labs	MGI		1/18/21	1 of 1
	3. Client Contact	5. Purchase Order No.	8. Client Reference No.	
		6800FA	202100071	

9. Code/Specification	10. NDT Procedure	11. Acceptance Criteria
API 1104	VT36041	API 1104

12. Material	13. Weld Process	14. Surface Condition	15. Temperature

16. Technique	17. Visual Aids	18. Supplemental Lighting
☐ Direct Visual ☑ Remote Visual ☐ Translucent Visual	☐ Yes ☐ No	☐ Yes ☐ No

19. Access within 24" & 30"	20. 1/32" Line/Simulated Imperfections Used	21. Dimensional Aids	22. Light Meter Serial No.
☐ Yes ☐ No	☐ Yes ☐ No	☐ Yes ☐ No	

23. Additional Information

VT Inspection of welds on steel gas couplings PART A and PART B

24. Unit	25. System	26. Component ID	27. Drawing

Test Results

28. ID/Weld No.	29. Indication Code(s)	30. Acc.	31. Rej.	32. Comments
PART A				
1	P, UC,IF		x	
2	P, UN,IF		x	
3	UN, UC,P		x	
4	UN,IF,P		x	
5	P,UC,CL		x	
6	UN,CL		x	
PART B				
1	P,UN,UC,		x	
2	CL, UC,P		x	
3	P,UC,		x	
4	UC,P		x	
5	UN,UC,P		x	
6	IF,CL,UC,P		x	

Indication Codes

CR	Crack	CL	Cold Lap	ES	Excessive Weld Spatter	AS	Arc Strike
IF	Incomplete Fusion	UN	Insufficient Fill or Undersize	WP	Weld Profile	GO	Gouge
PO	Porosity	ER	Excessive Reinforcement	SF	Surface Finish	PD	Physical Damage
UC	Undercut	SL	Slag or Flux	IP	Incomplete Penetration	CO	Corrosion
						OT	Other

33. Technician, Level & Date	34. Customer Signature (if applicable)	35. Management Review (if applicable)
Jamie Goolsbee		

Certificate of Inspection, Visual (Welds) 100-VTFORM-001 | Rev 2

Bolt-Style Coupling (pressures > 3 psig)

This form will be completed when LG&E or LG&E contractors expose a bolt-style coupling in a system where **the pressure is > 3 psig (medium and high-pressure distribution and transmission)** and the coupling will be backfilled. The purpose of the form is to provide Operations, Engineering and Gas Regulatory personnel with information about the bolt style coupling installation**.**

Part A- Discovery of Coupling

Precautions:

1. Stop excavation upon discovering the bolt-style coupling in the excavation
2. Set-up a perimeter around the excavation to keep the public away from the excavation

General Information:

1. Contact Employee for the bolt style coupling found: **Jim Wade**
2. Date of exposure: **December 16, 2020**
3. Location: **River Rd. & E. Witherspoon Rd.**
4. Size of coupling (based on pipe size if not exposed enough to determine): **16"**
5. Type of soil: ☐ Sandy ☐ Clay ☐ Gravel ☐ Topsoil ☐ Other (take picture and describe)
6. Soil Density test: ☐ Type A ☐Type B ☐Type C
7. Status: ☐ Removed ☐Abandoned in place ☐Backfilled- left in service
8. Discovery Method: ☐ Leak on Coupler ☐Other Maintenance Excavation ☐Facility Replacement ☐Facility Retirement ☐Other:

Pictures:

1. Take at least two pictures of the coupling. The pictures should be from different angles (additional pictures can be taken).
2. Email pictures to supervisor. Ensure pictures are attached to this form:

Sketch: Provide a sketch showing the coupling orientation (vertical/horizontal), nearby branches, pipe, valves and fittings, other utilities or structures, etc.

Leak Survey:

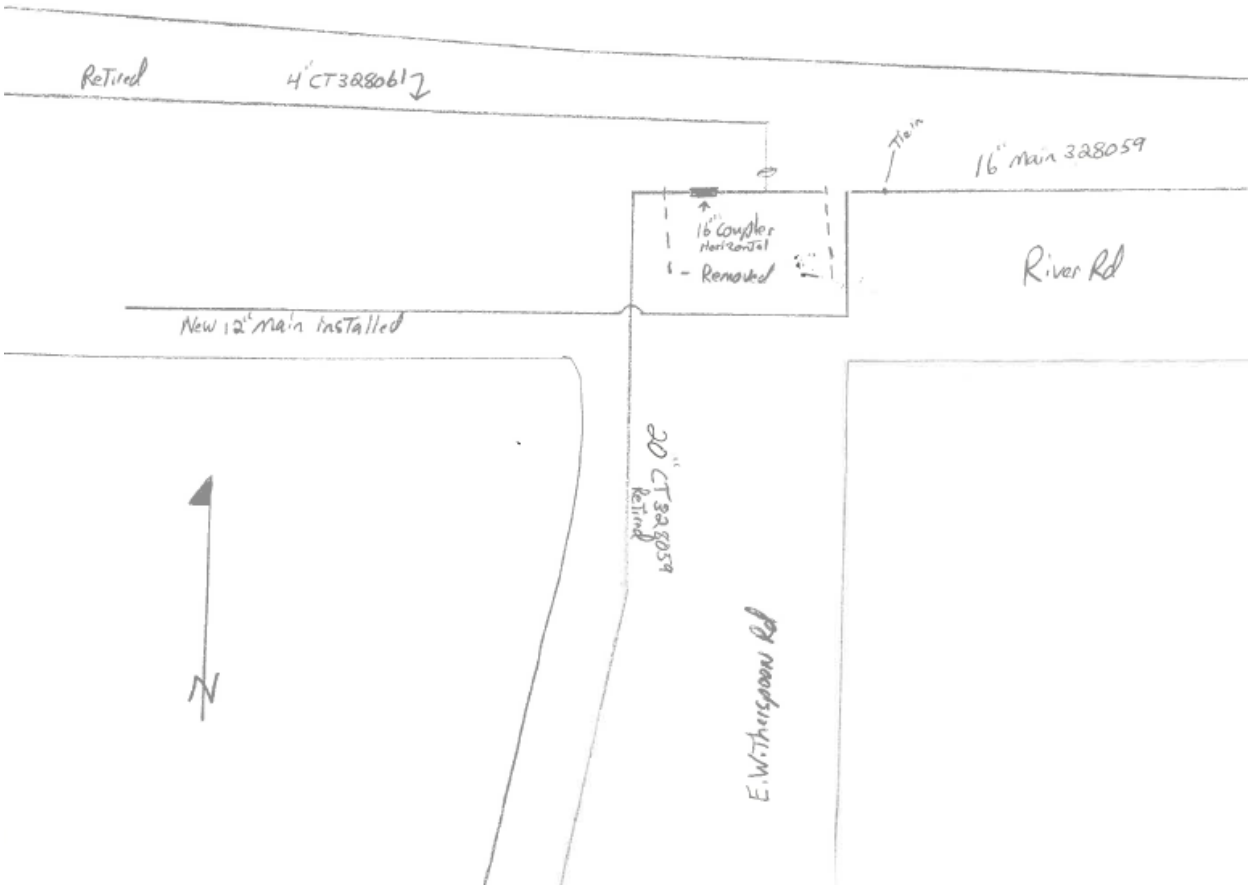
1. Use an instrument designed to detect natural gas to check for the presence of natural gas after backfilling the excavation. Include readings in the above sketch in relation to the coupling. If the contact employee is not leak survey qualified, they should contact:
    a. Their supervisor to call Gas Regulatory to complete the survey after the excavation is backfilled. Call (502) 627-4427.
    b. If Gas Regulatory is not available contact Gas Dispatch to have the survey assigned to a Gas Trouble Technician.

Leak Survey completed at time of backfill (circle one) yes no not applicable

Include completed form in the main report and email a scanned copy of the completed form (back and front) to the DIMP group at dimp@lge-ku.com .

Field Pictures

Sketch


Retired
4" CT328061
Tie-in
16" main 328059
16" Coupler
Horizontal
- Removed
River Rd
New 12" main installed
20" CT328059
Retired
E. Wilkinson Rd
N

Safety Briefing

Date: January 7, 2021

Employee Name	Employee ID
Sarah Nicholson	E029653
Craig Meade	E027537

	Hazards Identified
	Sharp edges on cut pipe ends. Wear gloves when handling.
	Pinch points on couplings. Wear gloves when handling.
	Some couplings samples are heavy. Use a partner to assist with moving. Use proper lifting techniques. Wear hard toes shoes.
	Debris may on samples. Wear eye protection.
	Tripping hazards on floor. Keep area clean and free of tripping hazards

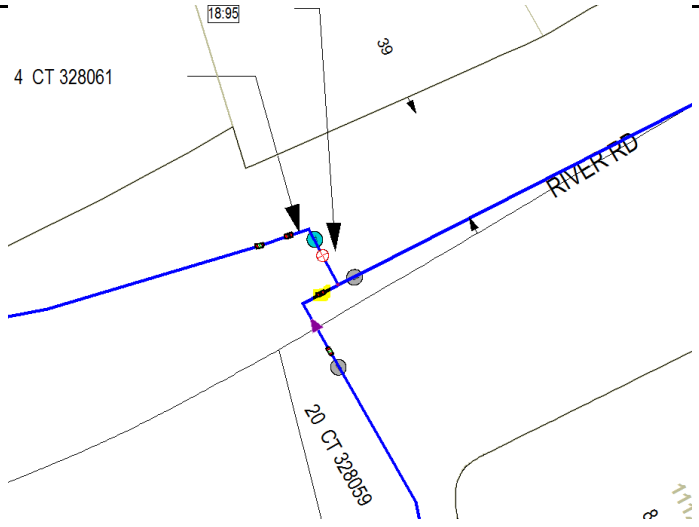
	PPE Required
	Hard toed shoes
	Safety glasses
	Gloves (leather preferred)

Part B- Coupling Information

General Information			Tracking #: YYYY-NN
PO Number 1076125	Expense Org 004610	Project 158276	Task COUPLER
Address/Location RIVER RD & E. WITHERSPOON RD			
Size 16”	Material STL	Coating CT	MAOP 99 PSIG
Main/Service Number 328059	Soil Type (from Part A) CLAY/SAND	Manufacturer DRESSER	Model
Pipe Connection:	Steel to Steel	Steel to Plastic	Plastic to Plastic

Historical Information	
Installation Date 6/4/1990	Document Source Quest
Installation Company Local	Document Source Quest
Foreman J. Shope [illegible]	Document Source Quest
Welder R. Watchel	Document Source Quest

GIS Information
Sys Id (of Coupler) 73415638
Screen Capture



Pictures (Label the following parts before taking pictures.)

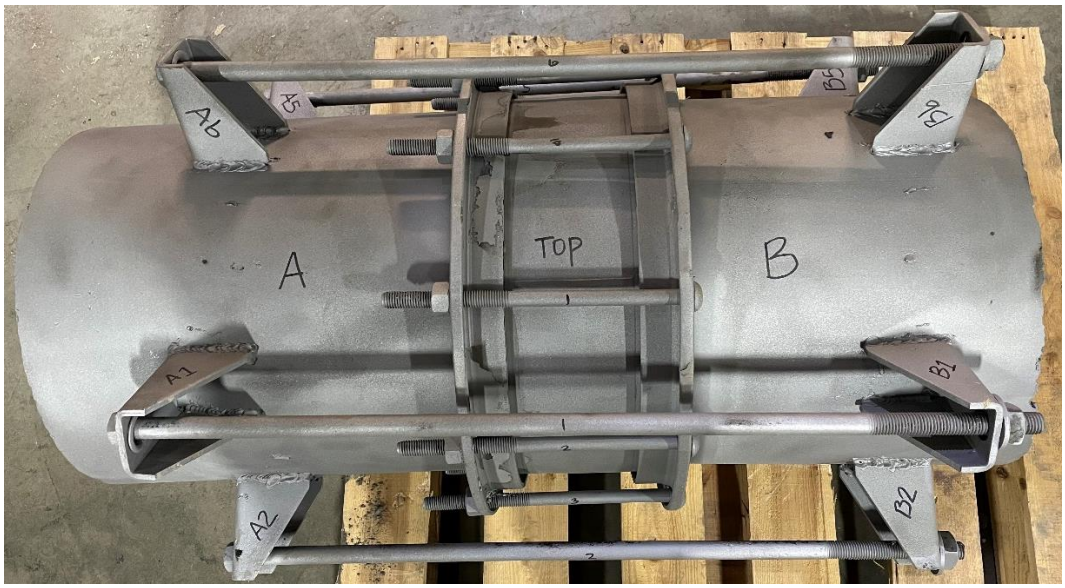


Figure 1 Top View

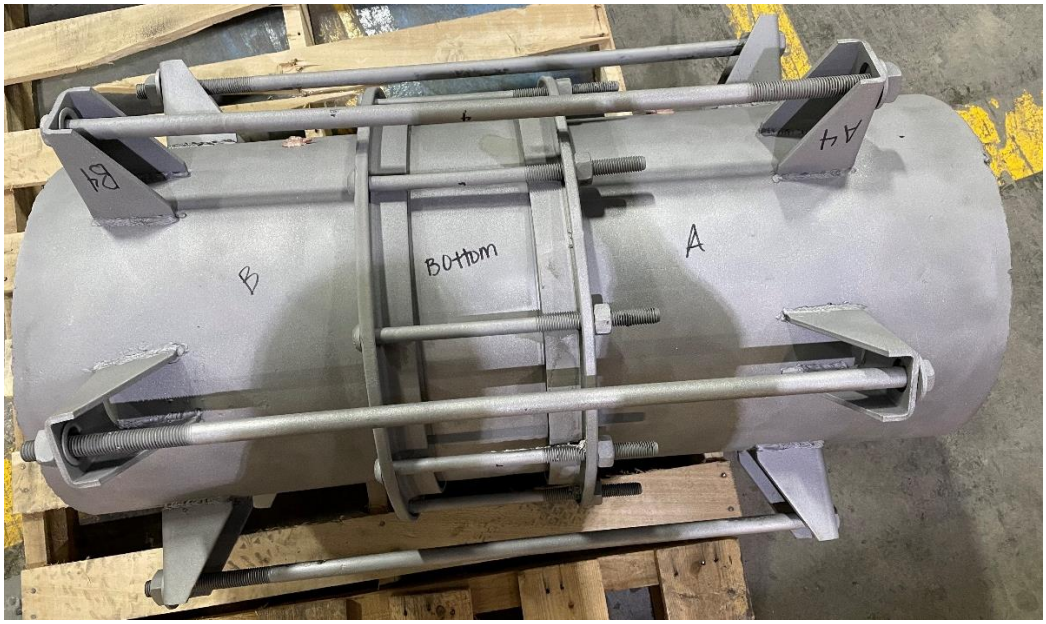


Figure 2 Bottom View

Figure 3 Coupler Top View

Figure 4 Reinforcement Rod 1

Figure 5 Reinforcement Rod 2

Figure 6 Reinforcement Rod 3

Figure 7 Reinforcement Rod 4

Figure 8 Reinforcement Rod 5

Figure 9 Reinforcement Rod 6

Figure 10 Lugs A1 & A6

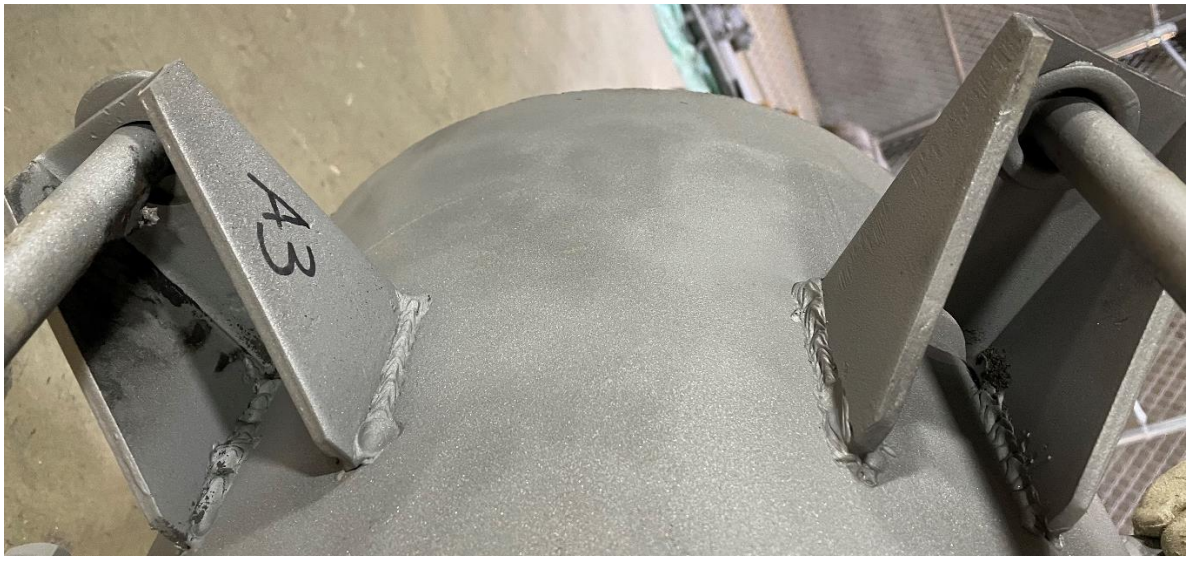


Figure 11 Lugs A2 & A3

Figure 12 Lugs A4 & A5

Figure 13 Lugs B1 & B6

Figure 14 Lugs B2 & B3

Figure 15 Lugs B4 & B5

Part C- Visual Inspection of Coupling

Visual Inspection Performed by: Sarah Nicholson & Craig Meade Date: _____

Table 1- Component Quantities

Number of Bolts on Coupler Body	10
Number of Reinforcement Rods	6
Number of Lugs	12

Table 2- Corrosion

	Pipe A	Pipe B	Coupler Body	Bolts	Rods	Lugs	Nuts
General External Corrosion?	NO	YES	NO	NO	NO	NO	NO
Localized External Corrosion?	NO	NO	NO	NO	NO	NO	NO
Pits Present?	NO	NO	NO	NO	NO	NO	NO
Internal Corrosion?	NO	NO					

***** If Pits are present take maximum depth measurements and put in the Additional Comments section.

Table 3- Coupler Body

Bolt	Washer Present	Nut present?
1	NO	YES
2	NO	YES
3	NO	YES
4	NO	YES
5	NO	YES
6	NO	YES
7	NO	YES
8	NO	YES
9	NO	YES
10	NO	YES

Table 4- Reinforcement Rods

Rod	Length (in.)	Diameter (in.)	Washer present at head of bolt?	Washer present at end of bolt?	Nut Present? Type?	Type of rod?
1	30.5”	0.74”	YES	YES	SQUARE	STANDARD
2	30.5”	0.74”	YES	YES	SQUARE	STANDARD
3	30.5”	0.74”	YES	YES	SQUARE	STANDARD
4	30.5”	0.74”	YES	YES	SQUARE	STANDARD
5	30.5”	0.74”	YES	YES	SQUARE	STANDARD
6	30.5”	0.74”	YES	YES	SQUARE	STANDARD

Type of Lug

(Please indicate the shape of the lug by circling one below. If the lug shape is different than any preset shape below, sketch the shape.)

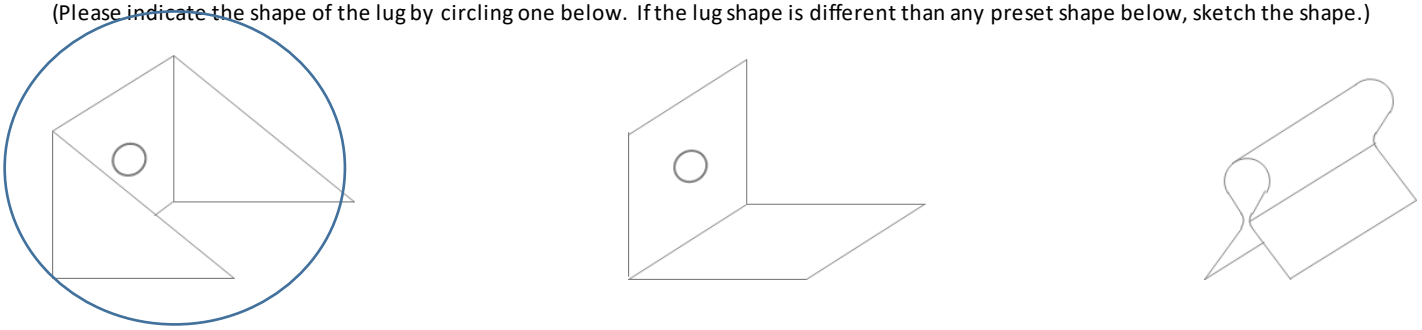


Table 5- Lugs (Measurements)

Pipe Side	Lug Number	Thickness (in.)	Circumference (in)	
			Distance to next lug, clockwise	Distance to next lug, counter-clockwise
A	1	0.24”	5”	41.25”
A	2	0.24”	5.25”	40.75”
A	3	0.24”	5.5”	40”
A	4	0.24”	5”	41”
A	5	0.25”	6”	39.75”
A	6	0.24”	7.5”	38.25”

Pipe Side	Lug Number	Thickness (in.)	Circumference (in)	
			Distance to next lug, clockwise	Distance to next lug, counter-clockwise
B	1	0.24”	40.75”	4.5”
B	2	0.23”	39.75”	5.75”

B	3	0.24”	40”	5.5”
B	4	0.25”	41.25”	5”
B	5	0.25”	39.25”	5.25”
B	6	0.24”	38.25”	7.5”

Examples- Circumference Measurement

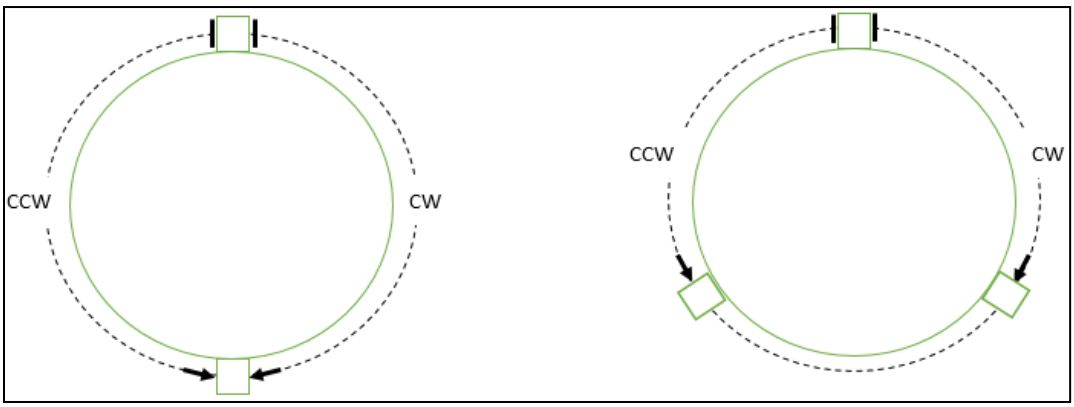


Table 6- Lugs (Observations)

Lug	Lug	Assembly sets aligned?	Deformed?	Deflected? (angle of)
A1	B1	NO	NO	NO
A2	B2	YES	NO	NO
A3	B3	YES	NO	NO
A4	B4	YES	NO	NO
A5	B5	YES	NO	NO
A6	B6	YES	NO	NO

Table 7- Lugs (Weld Quality)

Pipe Side	Lug Number	Any failed welds causing detachment?	Welded on all sides of exterior? If no, describe	Are welds on exterior continuous? If no, describe
A	1	NO	YES	YES
A	2	NO	YES	YES

A	3	NO	YES	YES
A	4	NO	YES	YES
A	5	NO	YES	YES
A	6	NO	YES	YES

Pipe Side	Lug Number	Welded on all sides of interior? If no, describe	Are welds on interior continuous? If no, describe
A	1	YES	YES
A	2	NO	YES
A	3	YES	YES
A	4	YES	YES
A	5	YES	YES
A	6	YES	YES

Pipe Side	Lug Number	Any failed welds causing detachment?	Welded on all sides of exterior? If no, describe	Are welds on exterior continuous? If no, describe
B	1	NO	YES	YES
B	2	NO	YES	YES
B	3	NO	YES	YES
B	4	NO	YES	YES
B	5	NO	YES	YES
B	6	NO	YES	YES

Pipe Side	Lug Number	Welded on all sides of interior? If no, describe	Are welds on interior continuous? If no, describe
A	1	YES	YES
A	2	YES	YES
A	3	YES	YES
A	4	YES	YES
A	5	YES	YES
A	6	YES	YES

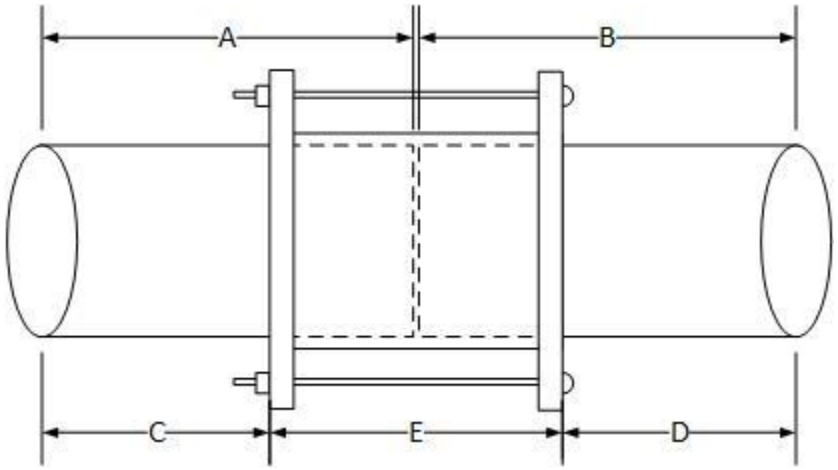


Table 8- Stab Depth

	A	B	C	D	Stab Depth (A-C) or (B-D)
Pipe Side A	20.75”		16.375”		4.375”
Pipe Side B		17”		12.25”	4.75”
	Sum of stab depths (should be closely equal to measurement E)				9.125”
	Coupler Length (E)				8.5”
	Difference				0.625”

Additional Comments - General Observations, Pit Depths, etc.

Revision Log

7.0 – Modified table 7 to clarify “detachment” wording, changed formatting, expanded tables, added example figures. CSM