ADVANCED CONDITION ASSESSMENT FOR PIPELINE REHABILITATION

Tata & Howard, Inc.

CONDITION ASSESSMENT OF CAST IRON WATER MAIN SAMPLES

1. Pipe Class Estimation **Based on Remaining** Wall Thickness

Nominal Diameter (in.)	Thickness Class	Thickness (in.)	Outside Diameter (in.)
(1116)	A	0.42	5.00
4			
	В	0.45	5.00
	C	0.48	5.00
	D	0.52	6.90
	A	0.44	6.90
6	В	0.48	7.10
	C	0.51	7.10
	D	0.55	7.10
8	А	0.46	9.05
	В	0.51	9.05
	C	0.56	9.30
	D	0.60	9.30
10	А	0.50	11.10
	В	0.57	11.10
	C	0.62	11.40
	D	0.68	11.40
12	A	0.54	13.20
	В	0.62	13.20
	С	0.62	13.50
	D A	0.75 0.57	13.50 15.30
14			
	В	0.66	15.30
	_	0.74	15.65
	D	0.82	15.65
	A	0.60	17.40
16	В	0.70	17.40
	С	0.80	17.80
	D	0.89	17.80
18	A	0.65	19.50
	В	0.75	19.50
	С	0.87	19.92
	D	0.96	19.92
20	А	0.67	21.60
	В	0.80	21.60
	С	0.92	22.06
	D	1.03	22.06
24	A	0.76	25.80
	В	0.89	25.80
	C	1.04	26.32
	D	1.16	26.32
	A	0.88	31.74
30	В	1.03	32.00
	C	1.20	32.40
36	D A	1.37 0.99	32.74 37.96
	В	1.15	38.30
	C	1.36	38.70
42	D	1.58	29.16
	A	1.10	44.20
	В	1.28	44.50
	С	1.54	45.10
	D	1.78	45.58
48	Α	1.26	50.50
	В	1.42	50.80
	С	1.71	51.40
	D	1 96	51 98

2. Pipe Crushing - ANSI A21.6-13 Yields Break Load of Sample



3. Remaining Factor of Safety Estimation

A. Calculate break load of the class of pipe the

2.5 factor of safety:

measured by pipe crushing

Break Load =

sample is estimated to be which includes a

B. Compare the calculated break load to the break load

South Central Connecticut Regional Water Authority

Pipe Samples - Ansonia 2012

Estimated Remaining Factor of Safety

6-inch Class C



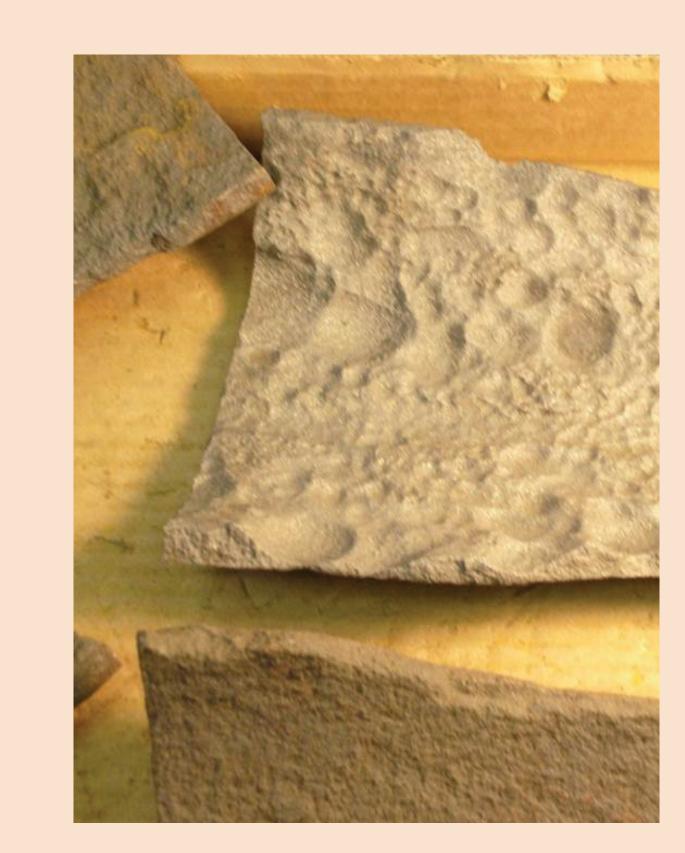
rupture modulus x wall thickness²

0.0795 x (diameter + wall thickness)



4. Visual Inspection

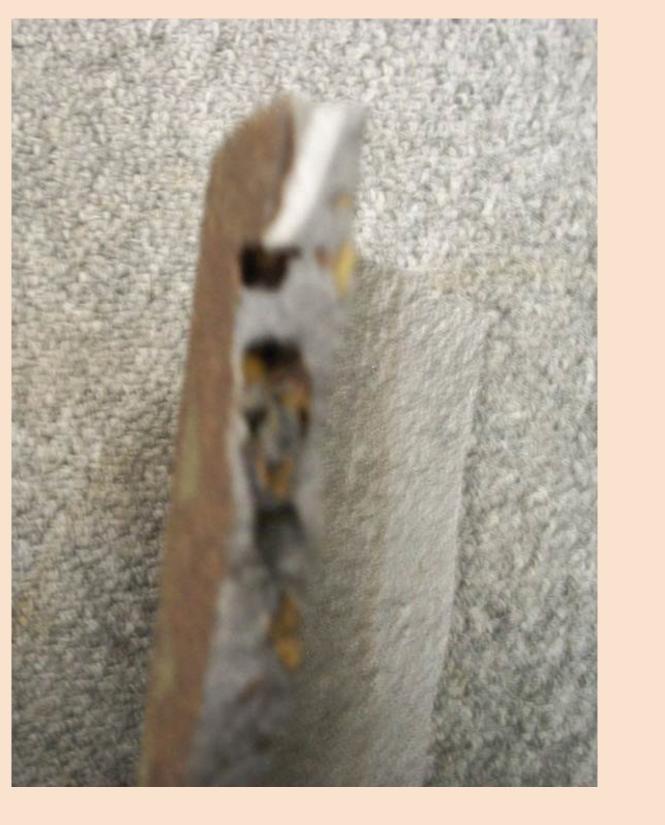
External Corrosion



Internal Corrosion



Wall Perforation



Air Inclusions



Stamps



Wall Thickness

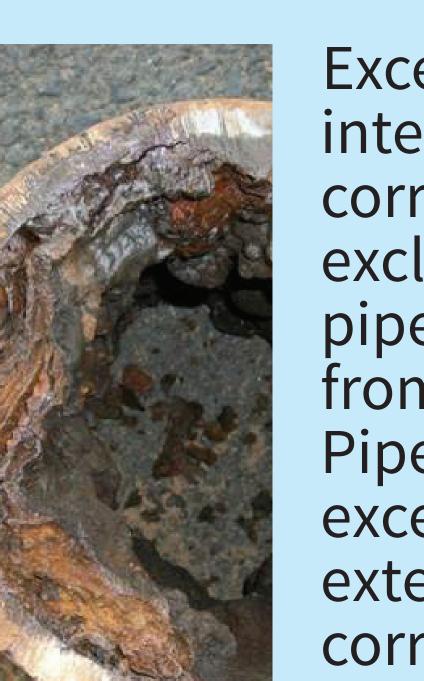
FIELD REPLACEMENT OR REHABILITATION DECISION MAKING

1. Approval or Rejection for Rehabilitation Based On the Following Factors:

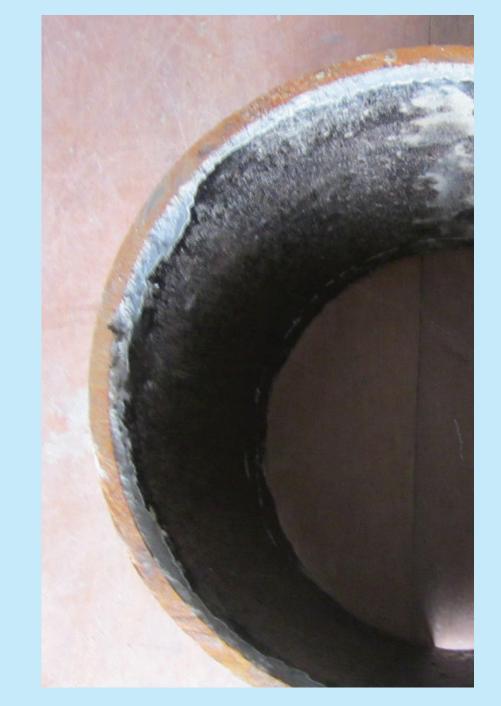
Pipe Class / Wall Thickness Extent of Corrosion Presence of Existing Liner



The pipe at left was rejected because of its thin, weak wall.



Excessive Pipes with excessive external



Although the lacks excessive corrosion, it was rejected for rehab because of its existing liner.

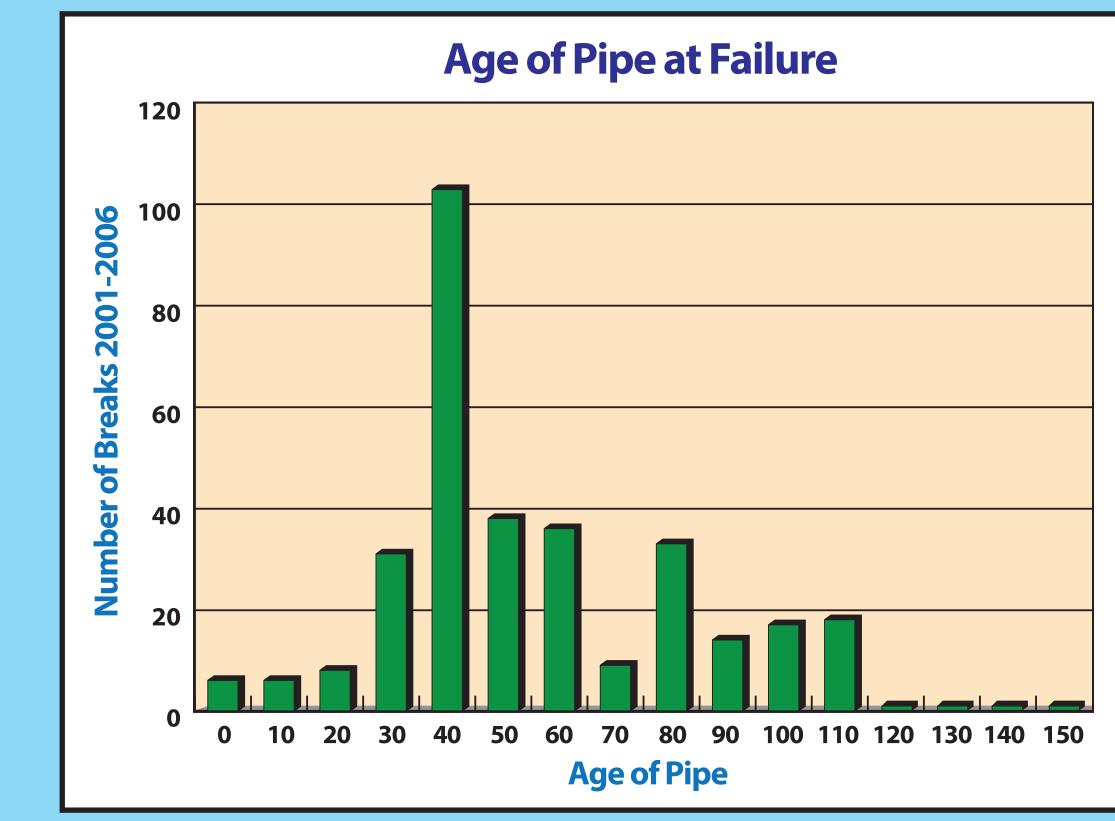
2. Field Pressure Testing

- Prior to Cleaning After Cleaning
- After Lining



All rejected pipe is scheduled for replacement.

- 1. Field sandblasting is effective
- 2. Old pipe does not mean weak pipe



- 3. 1.75 factor of safety limit for rehabilitation
- 4. Making the decision to rehab or replace in field during a cement cleaning and lining project allows the utility to spend capital efficiently

PIPE SAMPLE / TAP COUPON PROGRAMS

- 1. All tap coupons / sections of water main removed from system are evaluated as follows:
- Pipe Class
- Remaining Factor of Safety
- Extent of Corrosion
- Overall Condition



For more information, please contact info@tataandhoward.com or visit us at www.tataandhoward.com

