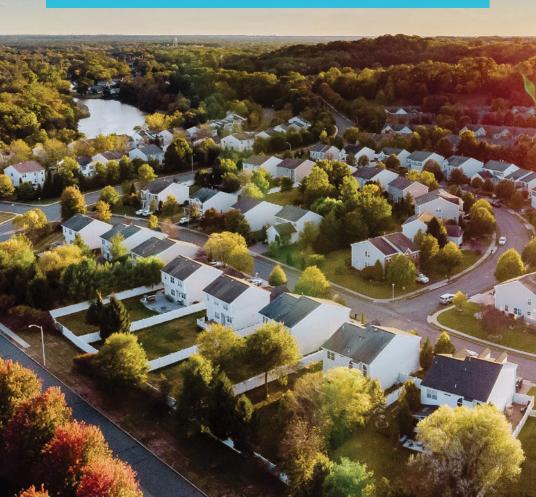


TRENCHLESS WATER MAIN RENEWAL

# THE FIELD-PROVEN SOLUTION FOR **RESILIENT WATER INFRASTRUCTURE**



# **DELIVERING RESILIENCE**

Our field recognized technology, ALTRA10, protects and renews your drinking water infrastructure from the inside with minimal disruption to your communities.

### **BENEFITS**

1,500 miles / 2,400 km installed to date:

#### PROVEN RESILIENCE

- Structural, class IV, high resiliency against severe soil movements like frost heave, flooding, landslides, subsidence, nearby excavations, and earthquakes;
- Proven resilience tested at Cornell University in 2019;
- Increased pressure and flow capacity;
- Added corrosion resistance:
- Regained full structural integrity;
- 100 year life expectancy.

#### **ENVIRONMENTAL BENEFITS**

- Elimination of risk of future water main breaks;
- Reduction of 55M m3 of drinking water leaks:
- Reduction of GHG emissions by 8X.

#### **INSTALLATION BENEFITS**

- Enable work in difficult to access, ecologically sensitive or high density area (e.g., highways, etc.);
- Quick installation with minimal disruption for the community;
- Little excavation and noise leading to fewer complains from neighboring residents;
- No disturbance to adjacent infrastructures;
- Line through bends and future service taps easily performed;
- No future maintenance required;
- Replacing lead services can be done simultaneously.

#### **ECONOMIC CONSIDERATIONS**

- Most cost effective water main infrastructure replacement methods:
- Reduction in treatment and pumping costs.

# THE MOST IN-DEPTH AND PROVEN EXPERIENCE IN NORTH AMERICA



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**INSTALLED OVER** 

2,400 KILOMETERS

**ACROSS** 

350 CITIES IN NORTH AMERICA.







## **TECHNICAL SPECIFICATIONS**

ALTRA10 DIAMETERS

4-24 inches (100-600 mm)

INSTALLATION LENGTH

Up to 1,000 feet (300 m) between access pits

**INSTALLATION METHOD** 

Pulled-in-Place Pipe (PIPP)

**OPERATING PRESSURE** 

Tested at greater than 150 psi (10 bars)

HAZEN-WILLIAMS COEFFICIENT

Greater than 120

LINER LIFESPAN

More than 100 year life expectancy

CLASS IV STAND-ALONE STRUCTURAL LINER

- Regained pressure and flow capacity
- Corrosion resistance
- Regained structural capacity
- Proven not to break upon hostpipe failure.

#### ALTRA10 LINER

Circular woven polyester and fiberglass jacket, impregnated with epoxy resin (proprietary formulation) with fused, watertight polymeric membrane.

The ALTRA10 structural liners offer many advantages, such as when:

- Maintains access to homes and businesses at all times
- Eliminates pipe breakage and deterioration
- Allows access to pipes inaccessible by digging

# **BASIC INSTALLATION STEPS**

#### 01. TEMPORARY BYPASS

Install temporary bypass through water meters or garden spigots

#### 02. EXCAVATION

Excavate access pits at each end of the pipe section

#### 03. CLEANING

Clean pipe with metal chain reamer

#### 04. INSPECTION

Inspect pipe through closed-circuit television (CCTV) inspection to map the service connections

#### 05. INSERTION

Insert plug in every service connection from inside the pipe using specialized robotic equipment

#### 06. INJECTION

Inject epoxy into the liner on-site and pull into place

#### 07. LINER FORMATION

Form the liner by sending swabs from one end to the other

#### 08. CURING

Circulate hot water for curing

#### 09. PRESSURE TEST

Perform hydrostatic pressure test

#### 10. REINSTATE SERVICE

Reinstate service connections from inside the pipe by drilling using specialized robotic equipment

# 11. DISINFECTION AND RECONNECTION

Disinfect the pipe, test, and reconnect water distribution system

#### 12. RESTORATION

Remove temporary bypass and restore site

# **CERTIFICATIONS**

- Compliant with BNQ 3660-950 et NSF/ANSI/CAN 61-G standards
- Mechanical properties exceed ASTM F1216 and ASTM F1743 Standards
- Tested in compliance with Australian/New Zealand Standard 4020 drinking water standards
- Meets the Solar Impulse Standards on Sustainability & Profitability

















