



37TH INTERNATIONAL
NO - DIG
FLORENCE 2019

Fortezza da Basso • FLORENCE (Italy)

30th September • 2nd October 2019

TITLE : Small or Big – we don't mind!
Watermain Inspection Technologies

AUTHOR : Piero Salvo, P. Eng. M. Eng.



Lunedì, 30 settembre 2019
17:00 – 17:20

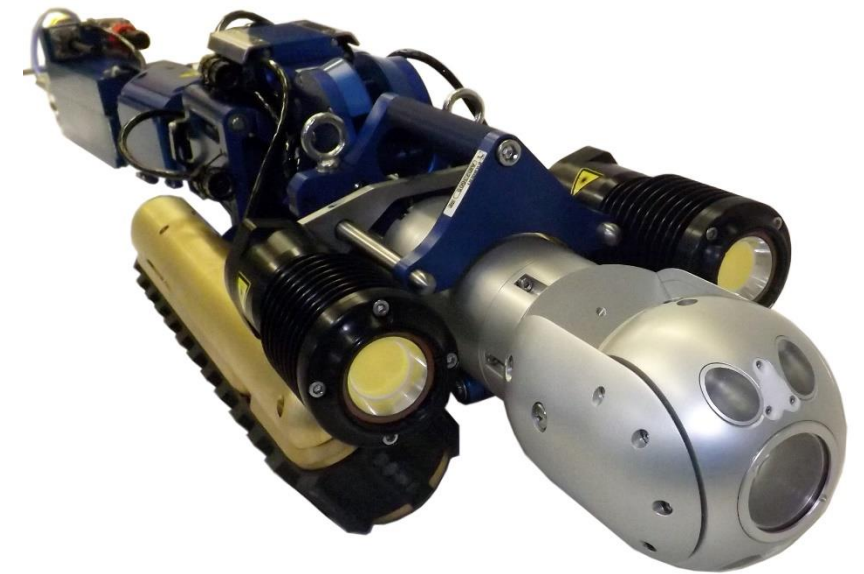
TITLE – Small or Big – we don't mind!



Small Pipe



Big Pipe



Big Pipe

TECHNOLOGY OVERVIEW

Investigator+™



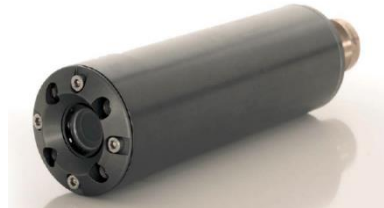
150 to 300 mm

Manual insertion

Insertion through Hydrants and
pressure fittings (50+ mm)

Live HD video
Live internal acoustics
Live pipe mapping capabilities

LDS1000™



> 300 mm

Flow dependant

Insertion through pressure
fittings (50+ mm)

Live HD video
Live internal acoustics
Live pipe mapping capabilities

ROV



> 350mm

Out of service
With or without water
Insertion through
≥300mm valve opening

Live HD video
Expandable Auxiliary
components

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Equipment Footprint

INVESTIGATOR+ :

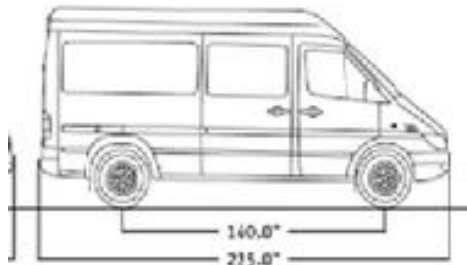
- **Cable slack** (2 – 3 m)
- **Working area** in between truck and insertion point

LDS1000 and ROV :

- **Tripod** (allows cable to be feed vertically inside the pipe)
- **Cable slack** (3 – 5 m)
- **Working area** in between truck and insertion point

➤ A typical job site will need to accommodate space for the following equipment:

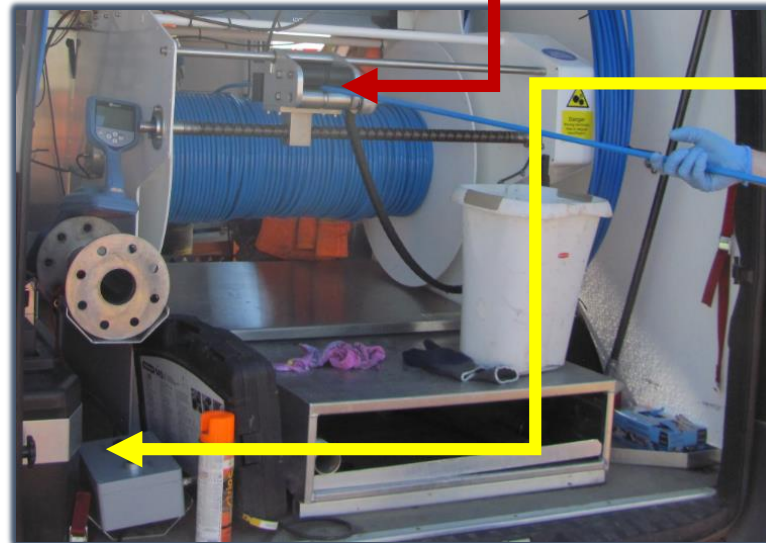
- Truck





Disinfection Process for all Tethered Technologies

- Prior to installing the launching device and camera head into the potable water network, the equipment is disinfected using a chlorine solution of 1000ppm or 1000mg\L.



Disinfection Chamber

Chlorine tank

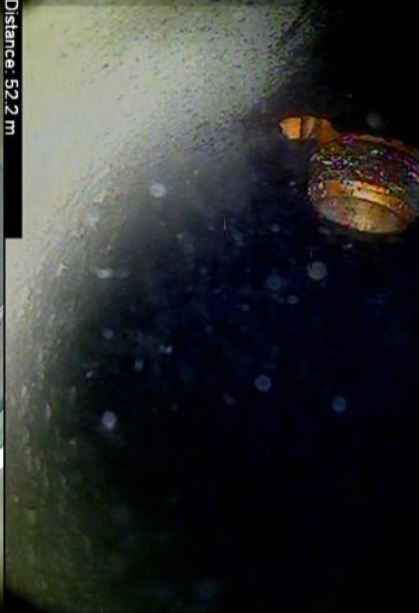
- Once decontaminated and installed, the disinfection chamber mechanism cleans the cable as it enters the main.
- Operators wear nitrile gloves when handling the cable.

Investigator+™

Distance: 35.3 m
07/27/2016 4:11:20 PM



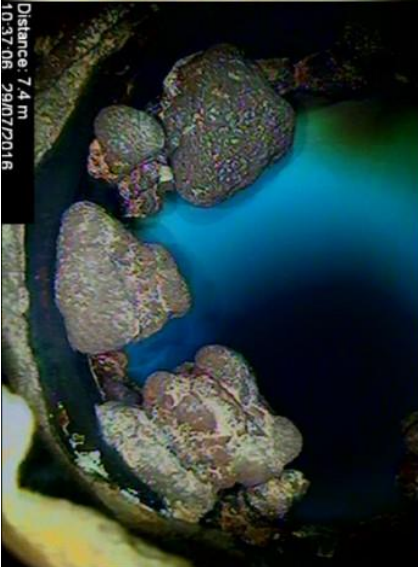
Distance: 52.2 m



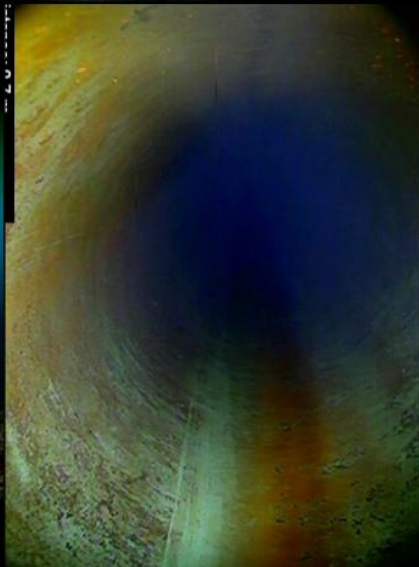
Distance: 53.4 m



Distance: 7.4 m
10/3/2016 2:07:20 PM



Distance: 28.8 m



Distance: 28.8 m



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TECHNOLOGY INSERTION OVERVIEW Investigator+™



- Insertion is done through an existing hydrant;
- Distances will vary depending on levels of tuberculation and changes in direction;
- Average insertion in each direction of hydrant tee is approximately 50 meters for PVC pipe and 25 meters for metallic pipes;
- An average of 4 – 5 hydrant inspections per day.

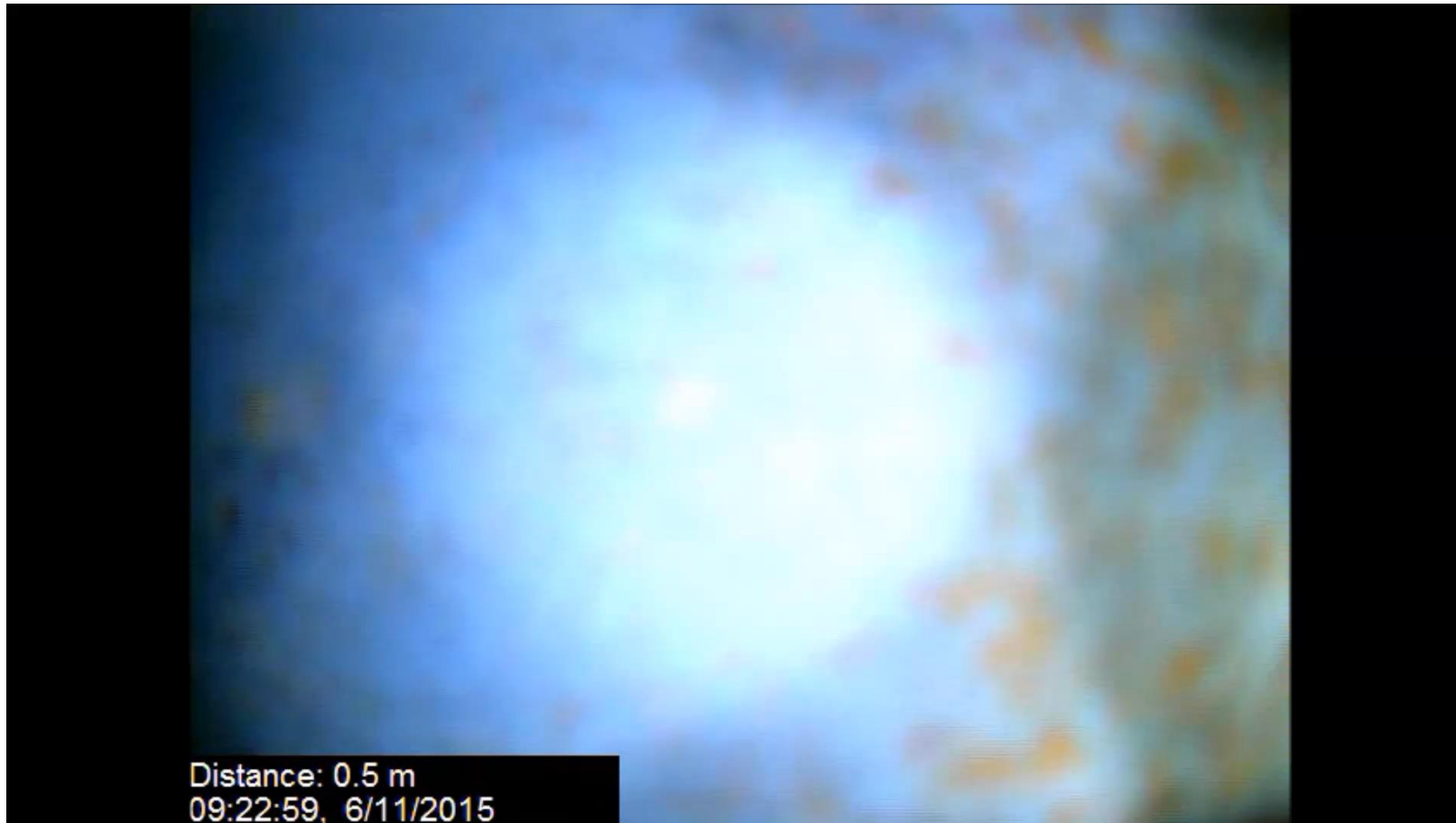


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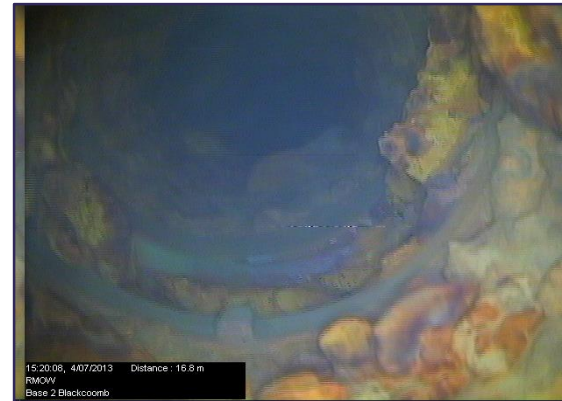
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Leak Caused By A Pinched Gasket



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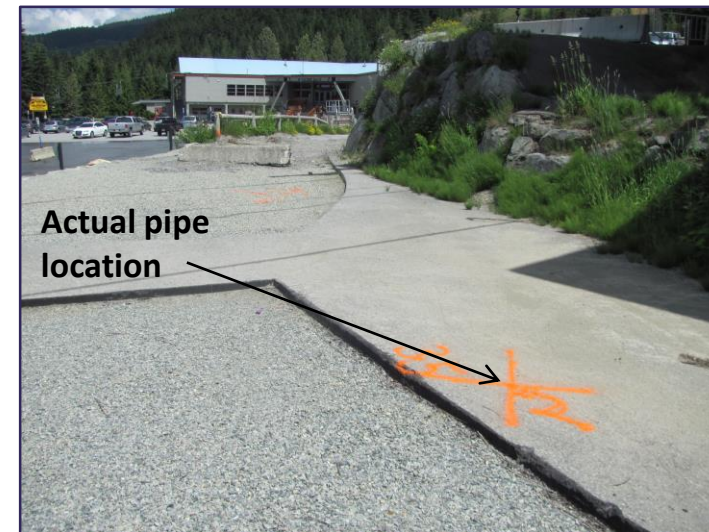
Pipe Mapping



Pipe location
according to plans

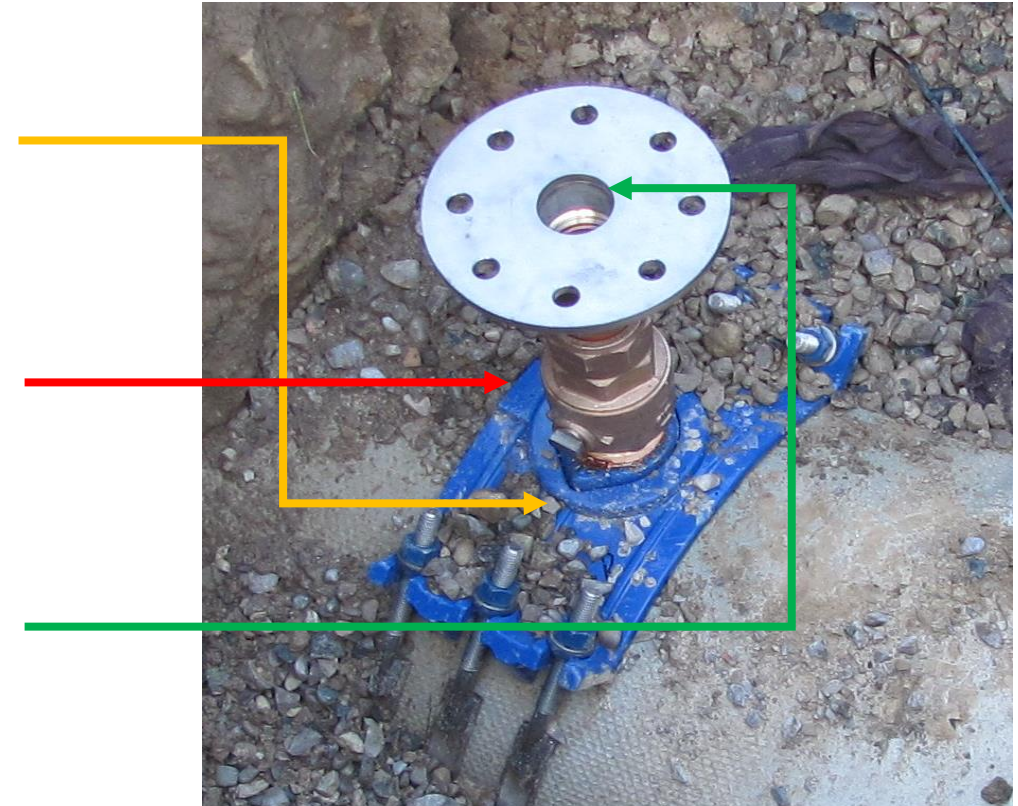


Actual pipe
location



Launching Device Installation LDS1000

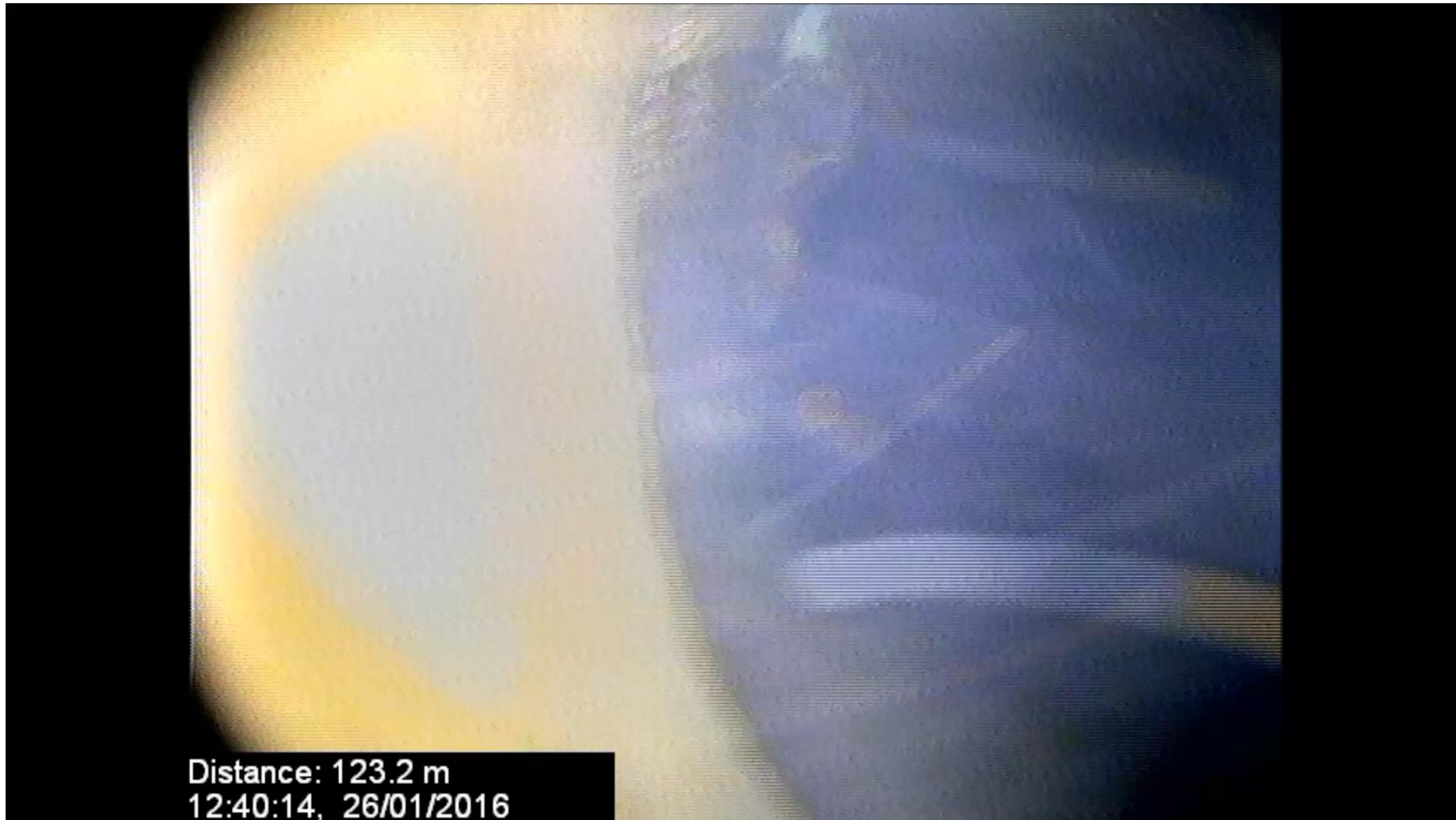
- The launching device can be installed on a 50mm – 100mm **tap** located at the crown of the pipe.
- A **ball valve** or **gate valve** will be used to isolate the system from the watermain during installation.
- A **flange** will be screwed on to the valve to allow the system to be secured in a vertical position over the pipe.



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**Distance: 123.2 m
12:40:14, 26/01/2016**

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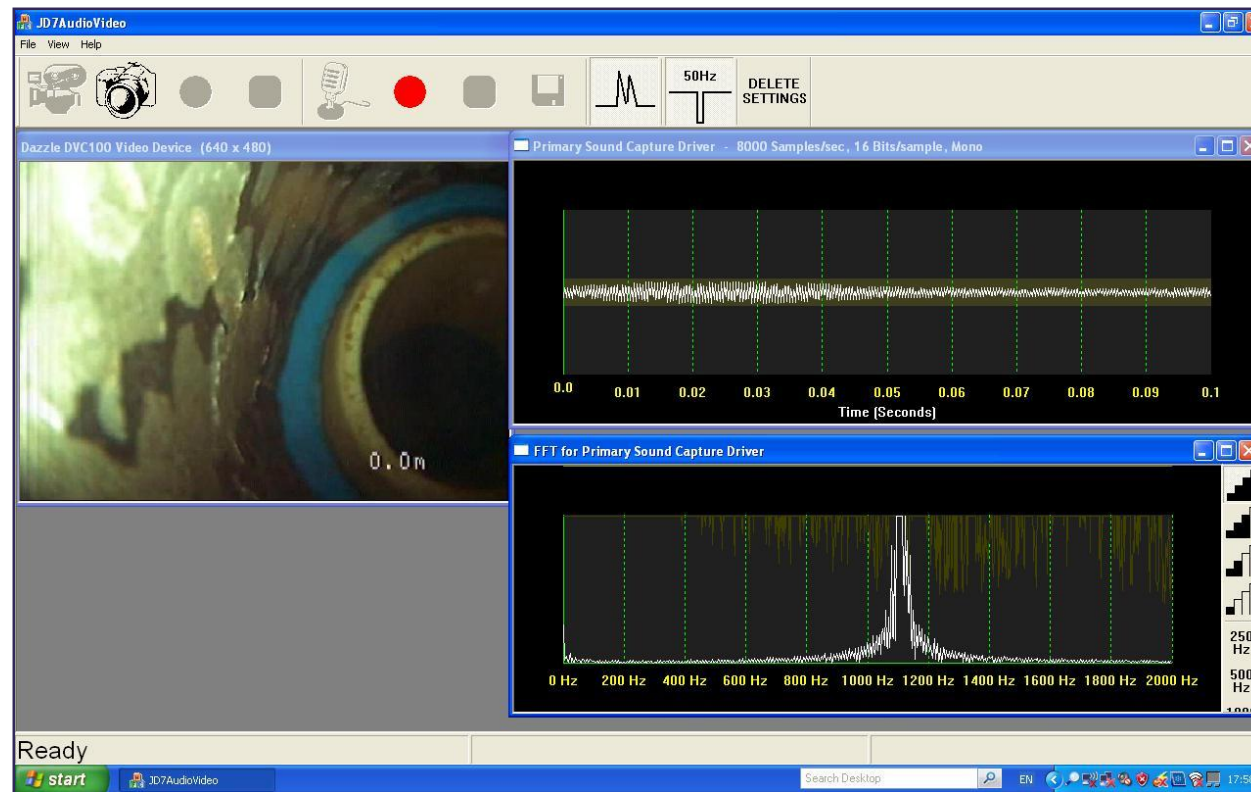
LDS1000[™] Inspection
Live or Out of service



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TECHNOLOGY OVERVIEW

Investigator+ TM & LDS1000 TM Visuals



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INVESTIGATOR+™ & LDS1000™ APPLICATIONS

- ▶ Leaks and air pockets
- ▶ Tuberculation or debris levels
- ▶ Valve status
- ▶ Undocumented fittings
- ▶ Pipeline material
- ▶ Unknown diameter changes
- ▶ Service connections
- ▶ Pipe blockages & flow restrictions
- ▶ Pre-inspection of pipes to be rehabilitated
- ▶ QA/QC of new pipes and of CIPP liners



ROV – City of Toronto Large Diameter Inspection **1200mm Riveted Steel Pipe and 2100mm Steel Pipe**

- The ROV Crawler can be inserted into any 300mm or larger pipe through existing Gate Valves, Butterfly Valves or any open section of pipe that allows for a minimum clearance of 300mm.
- Once inside the pipe, the ROV Crawler can be vertically adjusted to center the camera in the pipe.
- 1.2 km of HD Cable
- Approx. 9.0 m/min speed of inspection

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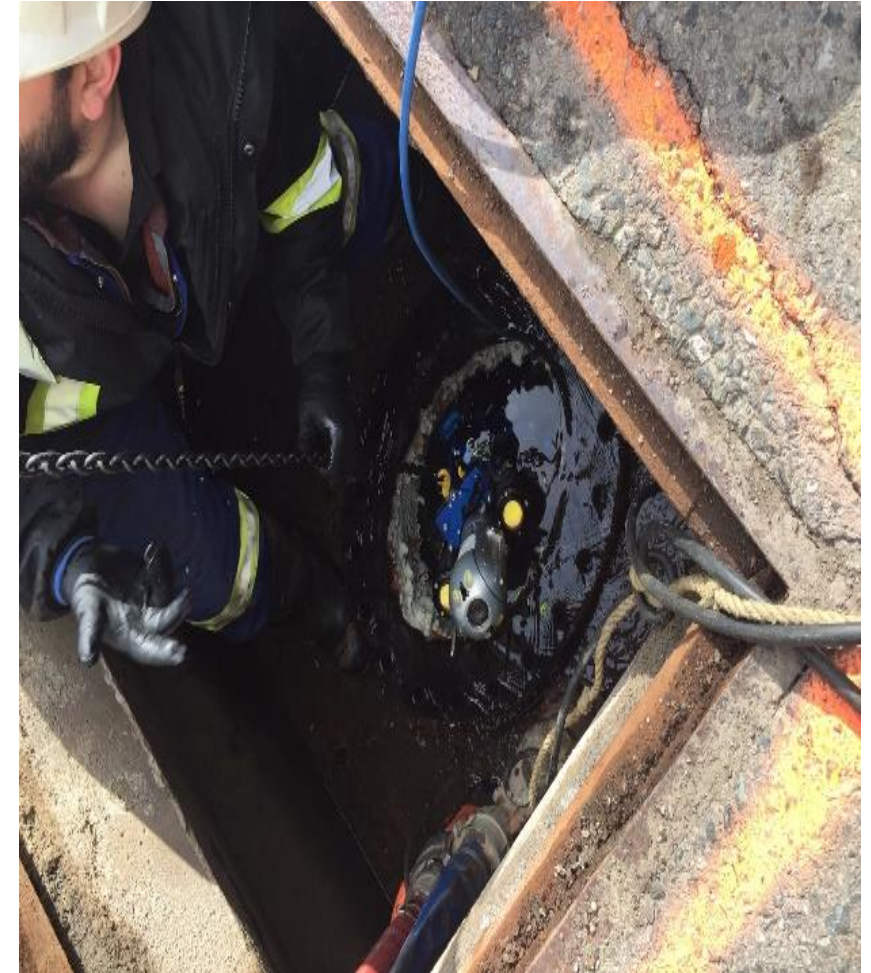


Typical Transmission watermain construction



1200mm Riveted Steel Pipe using a 1350mm steel casing

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Installation and access point for 2100mm CCTV

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CCTV visual of Drain valve in
1200mm Riveted Steel Pipe



CCTV inspection in a 2100mm
Steel Pipe with no water

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Thank You

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