New Standard for Sewer Lateral Condition Assessment

Find Infiltration & Certify Cured-In-Place Pipe

EPA-Referenced 7th EDITION, VOLUME 1, OPERATION AND MAINTENANCE OF WASTEWATER COLLECTION SYSTEMS manual.

New Lesson 4.4 - ELECTRO SCANNING INSPECTION by Ken Kerri, Ph.D., P.E.

Chapter 4 - Inspecting and Testing Collection Systems

• Find 90-100% of Infiltration Missed by CCTV Inspection.
• Determine Flow Reductions from Rehabilitation.
• Certify CIPP Lining, Repairs, & Rehabilitation.
• Identify Sources of Infiltration to Prevent SSOs.
• More Accurate Than Smoke or Dye Flood Testing.

Focused Electrode Leak Location (FELL)
Represents the industry's first reliable, proven, and measurable way to provide unbiased pipe condition assessment without third party data interpretation or operator coding.

Most Sewer Leaks Can't Be Seen or Measured Without FELL

Measure Same-Day Pre- & Post-Rehabilitation Defect Flows in Gallons Per Minute (GPM)


Services Available From Electro Scan Inc.

1745 Markston Road, Sacramento, California 95825-4026, USA | 916.779.0660 | info@electroscan.com | www.electroscan.com

TOO MUCH RAIN?

Chapter 4 - Inspecting and Testing Collection Systems

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In this project, 40 service laterals were inspected finding that only eight (8) laterals showed any leaks, with one (1) lateral representing seventy-one percent (71%) of the total infiltration and only two (2) laterals requiring lining. Despite the popular belief ‘that laterals contribute the majority of infiltration in this area’ it was found that sewer mains were not properly evaluated since previous assessments had been based on visual inspection.

<table>
<thead>
<tr>
<th>Date</th>
<th>Address</th>
<th>Material</th>
<th>Diameter</th>
<th>Distance</th>
<th>Small Defects</th>
<th>Med. Defects</th>
<th>Large Defects</th>
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Measuring Pre- and Post-Rehabilitation Defect Flows Using Electro Scan’s FELL

PROBLEM
Traditionally, cities and consulting engineers collected flow data from strategically positioned flow meters, lift stations, and treatment plants, to determine general areas where the greatest amount of Rain-Dependent Infiltration (RDI) entered the sewer network during wet weather events.

Often using multi-year readings to calibrate flow data, even longer periods may be needed to quantify reductions from rehabilitation. Requiring similarly sized wet weather events to occur, after completing repairs, rehabilitation, and replacement programs, engineers have routinely waited 3-5 years to report on rehabilitation effectiveness.

Not to mention flow data being thrown off by flow meters that go offline due to poor maintenance or battery issues, residential households using sump pumps, and other anomalies.

SOLUTION
Calibrated by consulting engineering firms, Electro Scan can now be used to provide a Baseline Gallon Per Minute (GPM) Defect Flow Analysis, before and after rehabilitation.

Agencies may now use Focused Electrode Leak Location (FELL) to provide same-day post-rehabilitation flow analysis that can be immediately compared to baseline readings in order to estimate reductions achieved from rehabilitation.

Cities can now identify and quantify sources of infiltration using machine-intelligent precision, helping decide whether laterals or sewer mains are contributing more infiltration, and allowing engineers to plan & execute targeted repair and rehabilitation programs on their most Critical Sewers®.

3 inches or 76.2mm Pipe Diameter

Bends & Tees are easily navigated with the Electro Scan ES-38 Probe.

90° Angle
You don’t have to argue anymore with homeowners, contractors, or council members, about what they see or don’t see using Closed-Circuit Television (CCTV). Now you can use next generation, machine-intelligent technology, to show where laterals are leaking.

ASTM F2550 standard covers the location & measurement of all cracks, fissures, broken joints, and leaking service connections, by measuring the change in electrical current able to pass through defects in a pipe wall.

Advantages
1. No manual coding required.
2. Finds 90-100% of leaks missed by CCTV.
3. Locates and measures leaks in GPM or LPS.
4. Finds surface, internal, and joint leaks.
5. Finds differences between pre- and post-rehabilitation.
6. Finds defects not seen by CCTV.

Limitations
1. Does not provide a clock position of defect location inside the pipe, but location is accurate to within 0.4 inches (1cm).
2. Does not scan metallic pipes or fittings, unless there is a coating or liner (minimum of 1-2mm).

Automatic, Measurable, & Unbiased Reporting

Conveyance: Service Laterals Connecting Residential, Commercial, and Industrial Customers to Municipal Sewer Mains.
Required Flow: None. Dry Pipe or Fully Surcharged Flow.

Pipes
- Pipe Diameters: 3 to 8 inch (76 to 200mm)
- Any, including Circular, Box, Oval, and Trapezoidal. Able to navigate 90° bends or elbows.
- Electrically Non-Conductive Pipe Walls, including, Asbestos Cement, Brick, Cement Mortar Lined and Coated Steel, Cured-In-Place Pipe, Ductile Iron, with Epoxy Coatings, Fiberglass Reinforced Pipe, High-Density Polyethylene Pipe, Prestressed Concrete Cylinder Pipe, Polyethylene, Polyvinyl Chloride, Reinforced Concrete, Vitrified Clay, etc.

ES-38
- Dimensions: Length: 6.5 inches (165mm); Diameter: 0.57 inches (15mm)
- Scan Recorder: Critical Sewers® Field Laptop PC, WiFi Connection to Critical Sewers® Cloud Application
- Scan Speed: 30 ft/minute (10m/minute)
- Environmental: IP 67. Able to withstand rain and low pressure wash down. 20°F to 120°F (-7°C to 50°C)
- Power Supply: 144a. 3.7V Rechargeable Lithium-Ion Batteries – or – 12V DC External Power Supply.
- Cable: 1/4 inches (6.5mm) fiberglass push rod. 200 ft (60m) range from single point of access.
- Reel: Diameter 24 inches, L24 inches, W12 inches, H32 inches (L66cm, W30cm, H81cm)
- Weight: 39 lb (17.7kg)
- Defect Flow Calculation: ± 30% Accuracy measured in Gallons Per Minute (GPM) or Liters Per Second (LPS).
- Defect Location: ± 0.4 inches (1 cm)


Advantages
1. No manual coding required.
2. Finds 90-100% of leaks missed by CCTV.
3. Locates and measures leaks in GPM or LPS.
4. Tracks pre- and post-rehabilitation (I/I) reduction.
5. Use in field either rain or shine.
7. Finds defects inside joints not seen by CCTV.

Limitations
1. Does not provide a clock position of defect location inside the pipe, but location is accurate to within 0.4 inches (1cm).
2. Does not scan metallic pipes or fittings, unless there is a coating or liner (minimum of 1-2mm).

ASTM F2550 Committee F36 Approved

Surface Electrode LOW Resistance Path Through Ground
Probe Cable Focused Tri-Electrode Array

HIGH Resistance Path Through Pipe Wall, Except Where There is a Pathway for Leakage

Pre-CIPP Post-CIPP
Pre-CIPP POST-CIPP ASSESSMENT
7532 Rolling River Drive - FELL Sewer Lateral Assessment

11 Defects - 3.71 GPM Defect Flow

ZERO INFILTRATION

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