
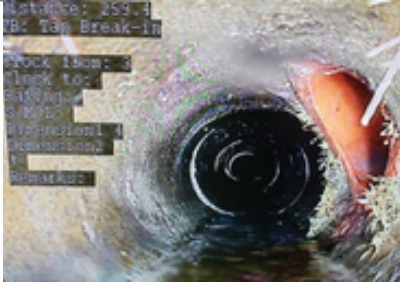




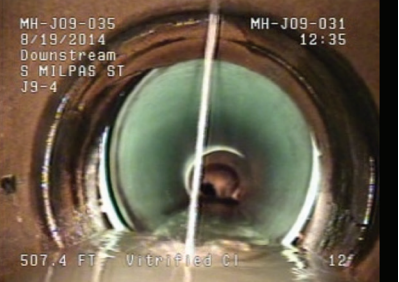


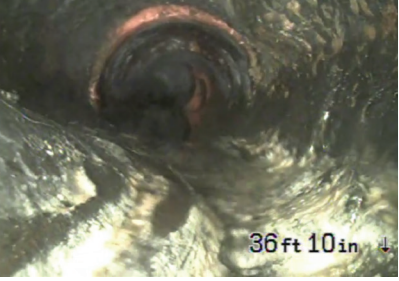
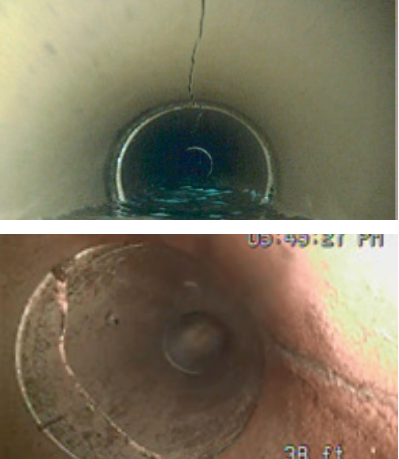


# Sewer Lateral Defects - Visual Glossary

Many of the typical defects found in old or damaged sewer laterals are shown in the images below. This Visual Glossary was developed to help property owners identify potential defects in their sewer lateral inspection video and to provide additional information on the defects' impacts to the sewer system. The corrective actions listed below are the available alternatives that property owners should consider when a defect or issue has been identified with their sewer lateral.

Maintaining your sewer lateral contributes to a healthy, effective, wastewater collection system for all.

Defect/Issue	Impact to Sewer System	Corrective Actions/Repair Options
 <p><b>Roots at Joint(s)</b></p>	<p>Roots blocking the lateral can result in a private spill. When roots intrude through failed joints near the public main, the roots can travel into the public main and cause a public spill.</p>	<ol style="list-style-type: none"> <li>1. Clean every 6 to 12 months to maintain functioning lateral and submit post-cleaning CCTV inspection to City for proof.</li> <li>2. Repair defective joints –CCTV inspection and monitoring to ensure roots do not enter other joints.</li> <li>3. Rehabilitate or spot line the segment of pipe.</li> <li>4. Replace entire lateral through trenching or pipe-bursting.</li> </ol>
 <p><b>Roots at Connection</b></p>	<p>Roots at the connection from the lateral to public sewer main can cause a private or public spill depending where the flow is blocked.</p>	<ol style="list-style-type: none"> <li>1. Replace connection.</li> <li>2. Rehabilitate connection using trenchless lateral connection seal (TopHat connection lining or equivalent method).</li> </ol>
 <p><b>Defective Connection</b></p>	<p>Protruding laterals can cause issues for maintenance crews to properly clean the sewer main.</p> <p>Defective connections (also known as tap break-ins) with ring-shaped space between the lateral and main can allow rainwater and groundwater infiltration, reducing capacity for sewage.</p>	<ol style="list-style-type: none"> <li>1. Replace connection.</li> <li>2. Rehabilitate connection using trenchless lateral connection seal (TopHat connection lining or equivalent method).</li> </ol>
 <p><b>Cast Iron Pipe</b></p>	<p>As cast iron pipe ages, it begins to corrode and restrict flow through a reduction in diameter. This can cause blockage or a private spill.</p>	<ol style="list-style-type: none"> <li>1. Aggressively clean to return lateral to original inside diameter and rehabilitate.</li> <li>2. Replace entire lateral through trenching or pipe bursting.</li> </ol>

Defect/Issue	Impact to Sewer System	Corrective Actions/Repair Options
 <p><b>Active Infiltration</b></p>	<p>Rainwater and groundwater entering through defective sewer laterals increases the amount of sewer flows conveyed to El Estero Water Resource Center, resulting in higher treatment and conveyance costs.</p>	<ol style="list-style-type: none"> <li>1. Repair point of infiltration.</li> <li>2. Replace or rehabilitate entire lateral to eliminate faulty joint or hole in pipe.</li> </ol>
 <p><b>Separated or Offset Joints</b></p>	<p>Failed joints can allow root intrusion which could cause a blockage or lead to rainwater and groundwater infiltration.</p>	<ol style="list-style-type: none"> <li>1. Repair each separated or offset joint.</li> <li>2. Depending on severity of offset joint(s), rehabilitation may be an option with one or a few point repairs.</li> <li>3. Replace entire lateral through trenching or pipe-bursting.</li> </ol>
 <p><b>Broken Pipe</b></p>	<p>A broken pipe can cause a number of issues such as root intrusion, infiltration of ground water, and exfiltration of sewage into soil. If the pipe is not repaired, the lateral could collapse causing a blockage and private spill.</p>	<ol style="list-style-type: none"> <li>1. Repair section of broken pipe.</li> <li>2. Rehabilitation may be possible depending on severity of broken pipe.</li> <li>3. Replace entire lateral through trenching or pipe-bursting.</li> </ol>
 <p><b>Orangeburg Pipe</b></p>	<p>Over time, laterals made from orangeburg pipe will deform, losing their structure and reducing conveyance capacity. If undetected, orangeburg pipe can collapse which can result in a blockage and private spill.</p>	<ol style="list-style-type: none"> <li>1. Replace the collapsed section.</li> <li>2. Replace all orangeburg portions of the lateral.</li> <li>3. Replace entire lateral through trenching or pipe-bursting.</li> </ol>
 <p><b>Cracks/ Fractures</b></p>	<p>Cracking is the first sign of the pipe reaching the end of its useful life. If the crack is not monitored, it can turn into fractures.</p> <p>If the crack transitions to a fracture (which means visible space in the gap), the separation may extend through the entire thickness of the pipe. This separation is how roots or water can infiltrate into the sewer lateral. Depending on the crack position, a fracture could also allow sewage to exfiltrate into the soil around the lateral.</p>	<ol style="list-style-type: none"> <li>1. Inspect every 4 to 6 months.</li> <li>2. Repair the cracked segment of pipe.</li> <li>3. Rehabilitate or spot line the segment of pipe.</li> <li>4. Replace entire lateral through trenching or pipe-bursting.</li> </ol>