

BES Branch CIPP Lining Administrative Rules

ENB – 4.33

December 2014



ENVIRONMENTAL SERVICES
CITY OF PORTLAND

working for clean rivers

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These are temporary administrative rules of the Bureau of Environmental Services (BES) CIPP Branch Lining Program.

1. Applicability

These rules apply to CIPP pipe lining for repair of branch sewer laterals in the public right-of-way.

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2. Purpose

These rules establish BES criteria for allowing the use of CIPP pipe lining for the public portion of sewer laterals (the portion of the lateral between the property line and the sewer main). These rules support the following City program goals:

- A. Pilot testing of new technology for pipe repairs;
- B. Enhancing consistency with plumbing regulations and materials allowed on private property; and
- C. Reducing site disruption and perhaps lowering sewer repair costs for property owners.

3. Definitions

Certain terms used in these rules are defined by Portland City Code (PCC) Chapter 17.32 and the following:

- A. **“Cured-In-Place Pipe (CIPP)”** means a resin-impregnated tube inserted into an existing pipe, expanded, and cured to form a new, lined, watertight pipe, in accordance with ASTM F1216, ASTM F1743, ASTM F2561, and the manufacturer’s recommendations.
- B. **“End Seal”** means continuous hydrophilic O-rings or an approved manufacturer-specific product that seals the ends of the CIPP with the existing City sewer main or original lateral pipe in a manner that prevents future infiltration or migration of fine aggregate.

4. Regulatory Authority

These rules are authorized by PCC Section 3.13.040.

5. Submittal and Project Approval Requirements

- A. **Approved Installers and Products.** Installers must submit the following information annually to be approved for lining work in the City right-of-way:
 - 1. *Certification.* Documentation that they are fully licensed, qualified, and certified as competent to perform the work associated with installing a specific manufactured lining product.
 - 2. *End Seal Information.* The manufacturer’s details for end seal products and specified installation methods.
- B. **Site Application for Use.** To be approved for use at a specific location in the City right-of-way, the site-specific application must include:
 - 1. *Pipe Preparation.* Installers must clean laterals so that the pipe is clean of roots, grease, sand, rocks, sludge, and other debris that could prevent the insertion of video equipment or installation of the liner.
 - 2. *Existing Condition Documentation.* Installers are required to:

T E M P O R A R Y A D M I N I S T R A T I V E R U L E

- a. Verify the status of a party sewer if one is suspected. If confirmed, the installer must provide surface markings indicating the location of the party sewer at the curb, any sewer breaks, and wye fittings; and
- b. Notify BES of unforeseen physical conditions in the work area that are uncovered during the investigation, or if the ovality of the original lateral exceeds 5%.

C. Use of Approved Materials.

1. *Liner Tubes.* All liner materials must be resin-impregnated, non-woven, flexible, polyester felt or equivalent material which is inserted into the lateral and cured - in - place by a method approved in writing by BES. The polyurethane or polyethylene membrane coating must be suitable for protecting the interior surface and for providing a uniform, smooth flow surface. Liner transitions in diameter must match field conditions.
2. *Curing Resins.* A liquid thermosetting resin suitable for the specific design conditions and curing process must be used. The resin must be a corrosion resistant polyester, vinyl ester, or epoxy, as recommended by the liner manufacturer. Resin must be colored with a pigment compatible with the resin system, as specified by the resin manufacturer. Resin must saturate the liner tube material and produce a hard CIPP which is resistant to abrasion due to solids, grit, and sand, and chemically resistant per ASTM F1216.
3. *End Seals.* End seals approved for use by the lining material manufacturer must be used. If the proposed CIPP system does not include an approvable end seal, a positive connection to the City sewer will be required from the ground surface.
4. *Final Material Properties.* The finished CIPP liner must meet the following:
 - a. Approved Testing.

Characteristic	Test Method	Polyester Resin
Initial Flexural Strength	ASTM D790	4,500 psi
Initial Flexural Modulus of Elasticity	ASTM D790	400,000 psi (min)

b. Approved Thickness:

Lateral Nominal Diameter	CIPP Thickness
4-inch	3.0 mm (4.5mm maximum)
5-Inch	4.5 mm
6-inch	4.5 mm
8-inch	6.0 mm

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6. Installation Requirements

Installers must meet the general requirements and standards of the Sewer Connection Rules (Portland Policy Documents item ENB-4.17) plus:

A. Field-verification.

1. *Calculations.* All dimensions must be field-verified prior to manufacture and delivery of the liner tube. All allowances in longitudinal and circumferential expansion must be considered when sizing and installing the liner.
2. *Materials.* Materials must be shipped, handled, supported, protected, and stored per manufacturer's recommendations and as approved by BES. The condition of the liner must be verified prior to installation. Torn, cut or otherwise damaged portions of the liner must be replaced, before proceeding with or during installation.

B. Installation. Liners must be installed per manufacturer's recommendations. A continuous or properly trimmed end seal must be installed between the ends of the new pipe liner and the original pipe connection, as approved by and according to the manufacturer's recommendations.

C. Curb Marker and Marker Balls. Curb markers and marker balls must be installed per Detail P-262 and Section 00446 of the City of Portland Standard Construction Specifications. These installations must be documented by post-development photo or video (see Section 6.E).

D. Site Cleanup. Installers must remove all installation and curing equipment from the original pipe once the curing process is complete. No material other than the cured CIPP is allowed in the lateral. Foreign intrusions, dry spots, pinholes, delamination, and wrinkles in any location must not exceed 10 percent of the lateral inside diameter.

E. Pre- and Post- Installation Video. Installers must provide pre- and post-installation videos for the entire segment of lined lateral from the building drain to the City sewer main. The video must confirm the inside diameter, alignment, length, and condition of each lateral proposed to be lined. Video inspection materials submitted to the Bureau of Environmental Services will not be returned. Videos furnished for review that fail to meet any of the following requirements may be rejected:

1. *Identification.* All video inspection materials must be permanently and legibly identified with the site address, date of inspection and the video contractor's contact information.
2. *Saturation.* At the start of the video inspection, water must be introduced into the building sewer at or near the connection of the building sewer to the building drain for not less than one minute.

TEMPORARY ADMINISTRATIVE RULE

3. *Distance.* The video must display the entire lateral distance from the building served to the City main. If there is a break in the line that disrupts continuous taping, then the video must be reversed back to the point of origin.
 4. *Image Quality.* The video image must be clear, unobstructed, and fully illuminated for the entire length of sewer or rain drain line in both directions and for the entire video duration.
 5. *Voice Over.* A clear and precise voice over noting all issues identified is required.
 6. *Footage Markers.* The video must include accurate footage markers for the entire length of the sewer video inspection.
 7. *Imperviousness.* Temporary introduction of water into the system is required to detect sags, bellies, and areas of visible infiltration.
- F. As-Builts.** A neat, dimensioned "As-Built" drawing of the entire installation must be provided on the BES form (Appendix A) and must include the following notations:
1. Project address;
 2. Building footprint;
 3. Directional arrow point in the north direction;
 4. The number and degrees of bends, cleanouts, and other fittings; and
 5. Listed pipe depths at the upper and lower ends of connection.
- G. BES Acceptance.**
1. BES will accept the final CIPP lateral liner based on visual inspection of the installation videos. BES will only accept laterals that:
 - a. Fit tightly to the original lateral pipe;
 - b. Are as free as commercially practicable of visual defects;
 - c. Have a continuous and single length of liner material for the entire length of the lateral repair;
 - d. Have no observable infiltration;
 - e. Have open, clear, and watertight active service connections; and
 - f. Are free of excessive wrinkles, cracks, lifts, scalds, blisters, delamination, sags or bellies.
 2. The existing original lateral may have irregularities, such as offset joints, protrusions, bumps, and deformations. If the irregularities remain, exceptions to the conditions of acceptance may be allowed by BES.
 3. CIPP liners that do not meet the criteria of Section 6 will not be accepted. Installers may be required by BES to remove a defective CIPP liner and replace it with either a sound liner or a new lateral through open-trench methods.

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7. Administrative Review

Installers may request reconsideration of a BES decision through BES administrative review and appeal to the City Code Hearings Officer (CHO) per PCC Title 22.

Potential appellants must exhaust all BES resolution options prior to appeal to the CHO. An appellant must file the CHO appeal request with BES along with payment of the appeal fee established in the annual BES rate ordinance. This fee will be fully refunded if the CHO does not find for BES on all issues.

TEMPORARY ADMINISTRATIVE
RULE

APPENDIX A – CIPP As-Built Form

**Cured-in-Place Pipe
As-Built Record**



Property Address:

Permit #: _____

Printed Name of Contractor/Representative/Installer: _____

Signature of Contractor/Representative/Installer: _____

Today's Date: _____