

Administrative Rules for Use of CIPP Lining in Privately Maintained Pipe in the Public Right of Way

ENB – 4.33

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ENVIRONMENTAL SERVICES
CITY OF PORTLAND

working for clean rivers

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ENB-4.33 – Administrative Rules for Use of CIPP Lining in Privately Maintained
Pipe in the Public Right of Way

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These are administrative rules of the Bureau of Environmental Services (BES) governing the use of cured in place pipe (“CIPP”) lining technology in privately maintained pipe located within the public right of way.

1. Applicability

These rules apply to individuals who seek to use Cured in Place Pipe (“CIPP”) lining technology to repair any of the following types of pipes if they are within the City’s right of way: a) the portion of a publicly owned sewer lateral (“lateral”) that must be privately maintained under Portland City Code (PCC) section 17.32.070 B, and b) a privately owned sewer system that must be privately maintained under PCC section 17.32.070 A.

2. Purpose

These rules support the following City program goals:

- A. Enhancing consistency of materials in and regulations governing the publicly owned sewer system on the one hand and sewer systems on private property on the other hand;
- B. Reducing site disruption; and
- C. Promoting pipe repair methods that are more sustainable than alternate methods (use of CIPP lining reduces costs and waste associated with excavation of hardscape and trees that might otherwise be necessary to conduct repairs without the use of CIPP lining, and it extends the life of a pipe, delaying the need for replacement).

3. Definitions

The definitions of PCC Chapter 17.32 apply to these rules, as well as the following definitions:

- 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 a manufacturer-specific product approved in writing by BES that seals the ends of the CIPP with the existing City sewer main or original pipe in a manner that prevents future infiltration or migration of fine aggregate.
- C. **“Sewer lateral” (“lateral”)** means the underground pipe that connects the plumbing system of a building or buildings to a public sewer.

4. Regulatory Authority

These rules are authorized by PCC Section 3.13.040 and PCC Chapter 17.32.

5. Pre-Installation Requirements

A. Becoming an Approved Installer. An installer must submit the following information to BES annually to be authorized to conduct CIPP lining work in the City right-of-way:

1. *Certification.* Documentation that the installer is 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 that the installer intends to use in the City right-of-way.

B. Required Site Preparation and Investigation. For an installer's use of CIPP lining at a specific location in the City right-of-way to be an approved use under these rules, the installer must first conduct pipe preparation and an investigation of existing conditions in the work area as detailed in this subsection.

1. *Pipe Preparation.* An installer must clean a pipe to be repaired with CIPP lining 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. *Investigation and Documentation of Existing Conditions in Work Area.* Prior to commencing any pipe repair work governed by these rules, the installer must meet all of the following requirements:
 - a. If the installer suspects that the sewer line to be repaired is a party sewer, the installer must determine whether it is in fact a party sewer line. If prior to or during CIPP liner installation the installer determines the pipe to be repaired is a party sewer line, the installer must stop all work on the project, must contact the BES Nonconforming Sewer Program, and may not proceed with repair work before obtaining BES approval in writing. The installer must submit to BES a video recording of the party line and a map of surface markings that indicate the location of the party sewer, any sewer breaks, and wye fittings. An installer may never complete CIPP work to repair a pipe when the repair work would disrupt the flow of an identified "party" sewer line.
 - b. The installer must notify BES of unforeseen physical conditions in the work area that the installer discovered during the pre-repair investigation. Such unforeseen physical conditions in the work area that must be reported to BES include but are not limited to:

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- 1) Other utilities (e.g., gas service line or power line) are piercing the pipe to be repaired;
 - 2) There is infiltration of a steady stream of water (e.g., from a break in a water service line) into the pipe to be repaired; and
 - 3) There are large cavities or voids outside of the existing pipe to be repaired.
- c. The installer must notify BES if the installer determines that the ovality of the original pipe to be repaired exceeds 5%.
 - d. The installer must submit a pre-installation video to BES as described and required by Section 6.D of these rules.
- C. Field Verification of Dimensions of Pipe to be Repaired.** The installer must verify in the field all dimensions of the pipe to be repaired prior to the manufacture and delivery of the liner tube. The installer must consider all allowances in longitudinal and circumferential expansion when sizing and installing the liner.
- D.** The installer must inspect the liner and verify that it has no known defect prior to installation. Torn, cut or otherwise damaged portions of the liner must be replaced before installation if the defect was discovered prior to installation, and prior to completing installation if the defect was discovered during installation.

6. Installation Requirements

Individuals installing CIPP lining in the public right of way must meet the general requirements, permit requirements, and standards of ENB-4.17 (Sanitary System Connection Rules) in addition to meeting the requirements of subsections A through E of this section. Installation of CIPP on private property is outside the scope of these rules and outside of the jurisdiction of BES; a person seeking to install a continuous CIPP that begins on private property and continues into the public right of way should seek approval to install the portion of the CIPP that will be on private property from the appropriate authority.

A. Approved Use of CIPP Lining Products. Only BES-approved CIPP lining products may be installed in the City right-of-way. To be a product approved for use in the public right of way, the installer and the product's materials must meet all the requirements of this subsection and the product must have been approved in writing by BES for use. To obtain such approval, the installer must submit to the BES Vendor Review for Specifications and Materials Team a written request for approval to use a particular CIPP product in the public right of way, along with supporting materials. BES will respond to a request within 10 business days.

1. *Liner Tubes.* The liner material must be resin-impregnated, non-woven, flexible, and made of either polyester felt or an equivalent material per ASTM F1216. The polyurethane or polyethylene membrane coating must be suitable

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for protecting the interior surface of the pipe and for providing a uniform, smooth flow surface.

2. *Curing Resins.* The installer must use a liquid thermosetting resin that is suitable for the installer's specific design conditions and curing process. The resin must be a corrosion-resistant polyester, vinyl ester, or epoxy, as recommended by the liner manufacturer. The 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 that is resistant to abrasion from solids, grit, and sand, and that is chemically resistant per ASTM F1216.
3. *Final Material Properties.* The finished CIPP liner must pass the following tests and meet the following requirements:

a. Required Liner Testing.

Characteristic	Test Method	Minimum Passing Value for Polyester Resin
Initial Flexural Strength	ASTM D790	4,500 psi
Initial Flexural Modulus of Elasticity	ASTM D790	250,000 psi (minimum)

b. Approved Thickness.

Pipe 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

B. Installation Process.

1. *Liners.* Liners must be installed in the pipe and cured in place per the manufacturer's recommendations and as approved in writing by BES. The installer must ensure that liner transitions in diameter match the contours of the interior of the original pipe. Unless otherwise approved by BES in writing and specified in the applicable sewer connection permit that authorizes sewer repairs, an installer may only install CIPP liner in the portion of a publicly owned sewer lateral that is publicly maintained under PCC 17.32.070 B to the extent that doing so is necessary to achieve an effective end seal between the new CIPP liner in the privately maintained portion of the lateral and the original pipe.

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2. *End Seal or Approved Alternative.* The installer must either:
 - a. Install between the ends of the new CIPP liner and the original pipe a continuous or properly trimmed end seal approved for use by the lining material manufacturer and installed according to the manufacturer’s recommendations; or
 - b. Excavate from the ground surface to the City pipe under repair and construct a positive connection between the CIPP liner and the original pipe per section 7 of ENB-4.17.
3. *Curb Marker and Marker Balls.*
 - a. **Requirements when excavation was necessary.** Where excavation was conducted to construct a positive connection between the installed CIPP liner and the original pipe per section 6.B.2.b of these rules, curb markers and marker balls must be installed per Standard Detail P-262 and Section 00446 of the City of Portland Standard Construction Specifications (as modified by Special Provisions). Such curb marker and marker ball installations must be documented by post-development photo or video per Section 6.D of these rules.
 - b. **Requirements when excavation was not necessary.** When no excavation was required to complete the CIPP lining (approved end seals were properly installed), curb marker and marker balls must be installed as provided in the table in this subparagraph. Such curb marker and marker ball installations must be documented by post-development photo or video per Section 6.D of these rules.

Site-Specific Conditions Surrounding a CIPP Lining Installation:	Associated Installation Requirements:
The sewer pipe receiving CIPP lining serves a property with a curb on a paved public street	A curb marker must be installed per City Standard Detail P-262 and Section 00446.42(d) of the City Standard Construction Specifications (as amended by the Special Provision adopted in July 2015). Marker balls must be used as directed by BES or as required by conditions of issued sewer connection permit authorizing sewer repairs.
The sewer pipe receiving CIPP lining serves a property on which the pipe bisects the driveway	A curb marker must be inset in the driveway (i.e., top of marker must be flush with driveway surface) and in line with the curb, per City Standard

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	Detail P-262 and Section 00446.42(d) of the City Standard Construction Specifications (as amended by the Special Provision adopted in July 2015).
The sewer pipe receiving CIPP lining serves a property without a curb but on a paved public street	A marker ball must be installed at the edge of City-paved street, per City Code 17.32.070 B.1.d., City Standard Detail P-262 and Section 00446.41(a) of the City Standard Construction Specifications.
The sewer pipe receiving CIPP lining serves a property on an unimproved public street.	A marker ball must be installed 14 feet off the centerline of the right-of-way, per City Code 17.32.070 B.1.d., City Standard Detail P-262 and Section 00446.41(a) of the City Standard Construction Specifications.

C. 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 to remain in the repaired pipe. Foreign intrusions, delamination, and wrinkles in any location of the CIPP may not exceed 10 percent of the pipe’s inside diameter.

D. Pre- and Post-Installation Video. Installers must provide pre- and post-installation videos for the entire segment of pipe to be repaired from the building drain to the City sewer main. Pre-installation video may be submitted to BES after CIPP lining installation unless BES requires in writing that the pre-installation video be submitted to BES prior to installation of the CIPP liner. The pre-installation video must confirm the inside diameter, alignment, length, and condition of each pipe proposed to be lined. Video inspection materials submitted to the Bureau of Environmental Services will not be returned. BES may reject any video furnished by an installer for review by BES if the video does not meet all of the following requirements:

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 recorded video inspection, water must be introduced into the building sewer at or near the connection of the building sewer to the building drain for at least one minute to allow detection of sags, bellies, and areas of visible infiltration.

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3. *Distance.* The pre- and post- installation video must display continuous taping of the entire length of the pipe repaired, starting at one end, going to the other end of the pipe, and returning to the point of origin. In the case of a lateral pipe, this means there must be continuous taping in both directions of the entire length of the lateral between the building served and the sewer main.
 4. *Image Quality.* The video image must be clear, unobstructed, and show a fully illuminated pipe interior for the entire length of sewer or rain drain line in both directions and for the entire video duration.
 5. *Voice-Over.* The video's recorded audio must include a clear and precise voice-over noting all pipe features and issues identified, including but not limited to wyes, tees, horizontal bends, vertical grade breaks, and sewer cleanouts.
 6. *Footage Markers.* The video must include accurate footage markers for the entire length of the sewer video inspection.
- E. **As-Built.** A neat, dimensioned "as-built" drawing of the entire CIPP installation must be submitted to BES on the appropriate BES form, available at <https://www.portlandoregon.gov/bes/index.cfm?&a=637059>. The as-built drawing must include the following notations:
1. Project address;
 2. Building footprint;
 3. Directional arrow pointing North;
 4. The number and degrees of bends, cleanouts, and other fittings of the pipes to be repaired with CIPP lining; and
 5. Listed pipe depths at the upper and lower ends of connection.

7. Final BES Review and Approval of Repairs

A. **Review and Approval or Disapproval of Final Liner, Generally.** BES staff will review and either approve or disapprove each final CIPP liner installed under these rules based on visual inspection of the pre- and post-installation videos submitted by the CIPP installer.

B. Basis for Approval or Disapproval.

1. Except as provided in paragraph 3 of this subsection, BES may only approve CIPP liners that:
 - a. Fit tightly to the original pipe;
 - b. Are as free as commercially practicable of visual defects (e.g., wrinkles, cracks, lifts, scalds, blisters, and delamination);
 - c. Have a continuous and single length of liner material for the entire length of the pipe repair;

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- d. Have no observable infiltration;
 - e. Have open, clear, and watertight active service connections; and
 - f. Are free of sags or bellies.
2. Except as provided in paragraph 3 of this subsection, for an installed CIPP liner to be approved by BES, the liner and installer must meet the requirements and criteria of paragraph 1 of this subsection and Sections 5 and 6 of these rules. BES may require an installer to remove a defective CIPP liner and replace it with either a sound CIPP liner or a new, non-CIPP pipe installed through open-trench methods.
 3. The existing original pipe might have irregularities, such as offset joints, protrusions, bumps, and deformations prior to any CIPP repair work. If irregularities remain following CIPP installation, BES may choose to allow exceptions to the conditions of approval specified in paragraph 1 of this subsection.
 4. BES may only provide final (i.e. post-installation) approval of a particular CIPP repair if the repair and the submission to BES of all required documentation, including as-built forms and pre- and post-installation videos, are completed prior to the stated expiration of the permit relied on to complete the pipe repair. If a party has not completed permitted CIPP repairs and submitted required documentation prior to the expiration of the associated permit, the party must obtain a new sewer repair permit for the work in order for BES to complete final review and approval of the work.

8. Enforcement

Failure to comply with these rules could subject a property owner or their contractor to enforcement by BES under PCC section 17.32.140. Further, BES may refrain from issuing a party additional sewer repair permits until sewer repair permits that were previously issued to that party but are expired and unresolved have been approved by BES.

9. Administrative Review and Appeal

A person may request reconsideration of a BES decision through administrative review as described in this Section. After the requestor has exhausted all BES administrative review, the requestor may file for an appeal of a decision with the Code Hearings Officer (CHO) per Portland City Code Title 22. A person may only appeal a decision that is subject to administrative review by BES.

A. Administrative Review Requests. A person to whom a notice was addressed will have 20 business days from the date the notice is issued to submit a written request for administrative review. The requestor must provide all information known to the requestor that supports an assertion made in the written request

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for administrative review. The requestor must provide such information via graphic, written, or recorded communication, or in person at the administrative review meeting. BES will hold an administrative review meeting within 15 business days of receipt of the written request for administrative review unless BES determines that extenuating circumstances justify a reasonably longer timeframe or the requestor asks BES to delay the meeting. The requestor may provide detailed information in writing in lieu of attending the administrative review meeting.

- B. Non-Reviewable Items.** A BES decision made under these rules is subject to administrative review except that BES will not grant administrative review of a requirement stated in these rules to meet a technical standard.

Note: BES's initial decision on an application for a permit to complete CIPP sewer repair work in a public right of way, including permit denial or imposition of permit conditions, is subject to administrative review; however, BES's final determination on such an application is not appealable to the CHO.

- C. BES Evaluation.** BES will use authorizing code, the provisions of these rules, City records, and the testimony and documentation provided by the requestor to make a final determination on the issue that is the subject of administrative review.
- D. Final Determination.** BES will issue to the requestor a written final determination within 15 business days of the administrative review meeting unless BES determines that extenuating circumstances justify a reasonably longer period of evaluation. The written final determination will provide information about the process for filing an appeal to the CHO.

APPENDIX A—BACKGROUND INFORMATION

CIPP lining technology is a pipe rehabilitation method that involves inserting a flexible liner into the existing failing pipe and curing the liner with water, steam, or other approved means. The result is a rigid, smooth surface that seals cracks and restores the old pipe to near-new condition. The chief advantage of using CIPP lining technology is its “trench-less” nature. CIPP lining allows installers to reduce and sometimes avoid the need to excavate and replace sidewalks, curbs, trees, utilities, and other features, making CIPP less disruptive to the community and more sustainable than traditional open-trench methods.

The rules found in ENB-4.33 govern the use of cured-in-place pipe (CIPP) lining technology to repair privately owned and/or privately maintained sewer lines and laterals within the public right of way (“ROW”) in the City of Portland. These rules were adopted by the Director of BES in April 2017 and replaced temporary rules that authorized a pilot program that allowed CIPP technology to be used in this specific application by qualified contractors working for private property owners. As of March 2017, CIPP lining had been successfully installed under the temporary rules in over 200 private properties and had proved to be beneficial to property owners seeking to repair existing sewer lines and laterals in the public ROW. At the time the permanent rules were adopted, the City of Portland had already authorized use of CIPP technology to repair publicly owned and maintained lines in BES construction projects. The requirements of the permanent rules are substantively very similar to those of the temporary rules that were replaced.

As further background, ENB-4.33 helps implement Portland City Code (PCC) Chapter 17.32, “Public Sewer and Drainage System Permits, Connections and Maintenance.” That Chapter authorizes the Director of BES to administer and to thereby regulate access and connection to, and the use, construction, modification, maintenance, repair, and removal of, components of the City sewer, storm sewer, and drainage systems and their easements. With a very few exceptions for some completely privately owned nonconforming sewers, BES owns the portion of the sewer lateral that is within the public ROW. However, under PCC section 17.32.070, part of a public lateral is maintained by the City and the other portion, closest to the private building served by the lateral, generally must be maintained by the private property owner. It is vital that there is proper application of approved materials and methods by property owners and their contractors when repairs to the privately maintained portion of the sewer system, which connects to the publicly owned and maintained portion of the sewer system, are completed. Oversight of repair and connection activities by BES, as provided in ENB-4.33, ensures that property owners and their properties are served by a sound sewer collection system that protects water quality, public health, and the environment.

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