ASTM C1920-21

"Standard Practice for Cleaning of Vitrified Clay Sanitary Sewer Pipelines"

NCPI

NATIONAL CLAY PIPE INSTITUTE

The VCP Authority Since 1917

Kent Carlson
Vice President
National Clay Pipe Institute

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WHAT IS ASTM C1920-21

This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.

Designation: C1920 – 21

Standard Practice for Cleaning of Vitrified Clay Sanitary Sewer Pipelines[1]

This standard is issued under the fixed designation C1920; the number immediately following the designation indicates the year of original adoption or, in the case of revision, the year of last revision. A number in parentheses indicates the year of last reapproval. A superscript epsilon (ε) indicates an editorial change since the last revision or reapproval.

1. Scope

1.1 This practice covers the personnel requirements, operator training, operating procedures, and recommended equipment performance/design for the proper operation of pressure water-jet cleaning and cutting equipment as normally used by municipalities and contractors concerned with operations, maintenance and cleaning work of vitrified clay mainline sewer pipe.

1.2 The term "high-pressure water jetting" covers all water jetting, including the use of jets and hydromechanical tooling at pressures above 2000 psig (0.69 MPa).

1.3 This practice covers the "high-pressure water jetting" of vitrified clay pipe and should not be applied to other pipe and pipe lining materials without evaluating the recommended cleaning procedure from the manufacturer to avoid damage.

1.4 *Units*—The values stated in inch-pound units are to be regarded as the standard. The values given in parentheses are mathematical conversions to SI units that are provided for information only and are not considered standard.

1.5 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.6 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *CDC Standard:*[2]

Guidance for Reducing Health Risks to Workers Handling Human Waste or Sewage

2.2 *Federal Standards:*

DOT CFR 49 Parts 106-107, 171-180, and 390-397 HAZMAT Transportation Regulations for Domestic Shipping and Transporting of Hazardous Materials[3]

OSHA Public Law 91-596 Section 5[4]

OSHA 29 USC 654 Duties of Employers and Employees[4]

29 CFR 1910.120 Hazardous waste operations and emergency response[3]

US EPA Optimizing Operation, Maintenance and Rehabilitation of Sanitary Sewer Collection Systems[5]

Vitrified Clay Pipe Engineering Manual, 2017[6]

Vitrified Clay Pipe Operations & Maintenance Handbook, 2020[6]

3. Terminology

3.1 *Definitions:*

3.1.1 *high velocity sewer cleaner, n*—these portable units have the capability of generating variable water pressures through a hose up to 3500 psi (24 MPa) and variable flow rates of 50-125 gal per min (gpm) (180-473 L per min).

3.1.2 *boom, n*—telescopic vacuum tube mounted on a sewer cleaning truck chassis.

3.1.3 *bucket, n*—a special device designed to be pulled along a sewer for the removal of debris from the sewer.

3.1.3.1 *Discussion*—The bucket has one end open with the opposite end having a set of jaws. When pulled from the jaw end, the jaws are automatically opened. When pulled from the other end, the jaws close. In operation, the bucket is pulled into the debris from the jaw end and to a point where some of the debris has been forced into the bucket. The bucket is then pulled out of the sewer from the other end, causing the jaws to close and retain the debris. Once removed from the manhole, the bucket is emptied and the process repeated.

[1] This test method is under the jurisdiction of ASTM Committee C04 on Vitrified Clay Pipe and is the direct responsibility of Subcommittee C04.20 on Methods of Test and Specifications.

Current edition approved Dec. 1, 2021. Published December 2021. DOI: 10.1520/C1920-21.

[2] Available from Centers for Disease Control and Prevention (CDC), 1600 Clifton Rd., Atlanta, GA 30329-4027, http://www.cdc.gov.

[3] Available from U.S. Government Publishing Office (GPO), 732 N. Capitol St., NW, Washington, DC 20401, http://www.gpo.gov.

[4] Available from Occupational Safety and Health Administration (OSHA), 200 Constitution Ave., NW, Washington, DC 20210, http://www.osha.gov.

[5] Available from United States Environmental Protection Agency (EPA), William Jefferson Clinton Bldg., 1200 Pennsylvania Ave., NW, Washington, DC 20460, http://www.epa.gov.

[6] Available from National Clay Pipe Institute, 850 N. Wisconsin St., Ste 102, Elkhorn, WI 53121, https://www.ncpi.org.

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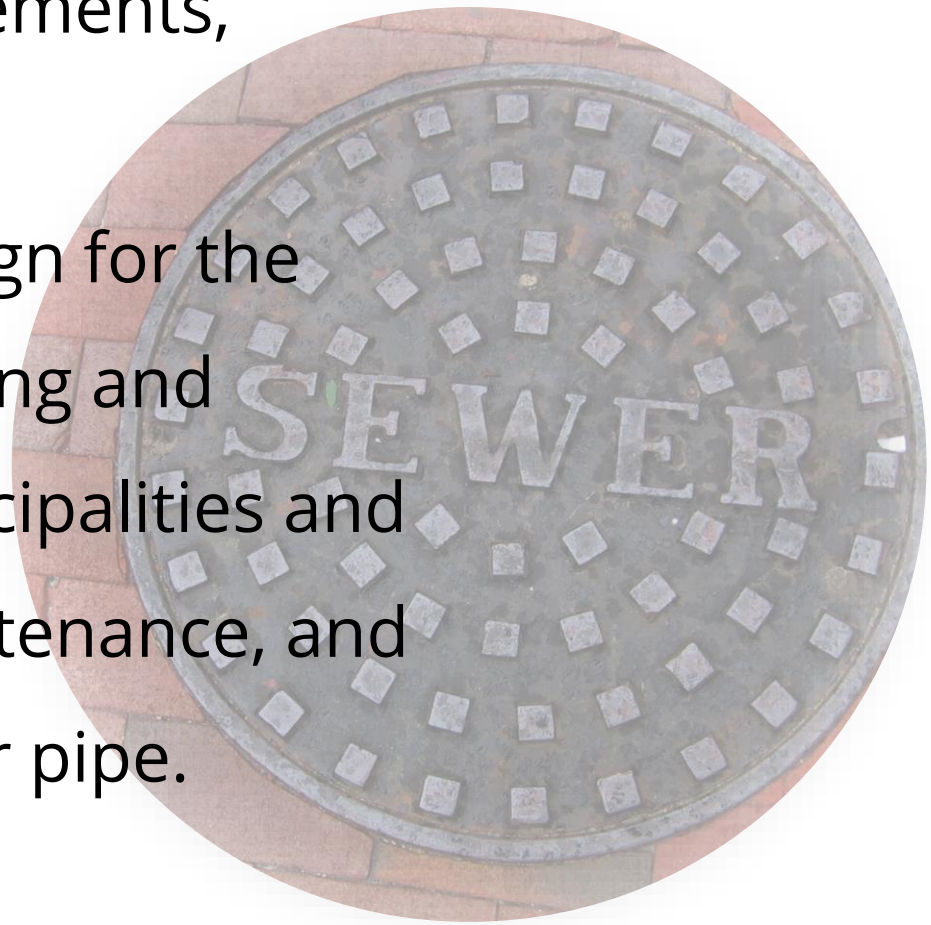
ASTM C1920-21 Presentation

Presentation Outline

- What is ASTM C1920-21
- Scope & Use
- Referenced Documents & Standards
- Terminology
- Significance & Use
- Safety
- Procedures
- Nozzles & Tools

SECTION 1 – SCOPE & USE

1.1 This practice covers the personnel requirements, operator training, operating procedures, and recommended equipment performance/design for the proper operation of pressure water-jet cleaning and cutting equipment as normally used by municipalities and contractors concerned with operations, maintenance, and cleaning work of vitrified clay **mainline** sewer pipe.

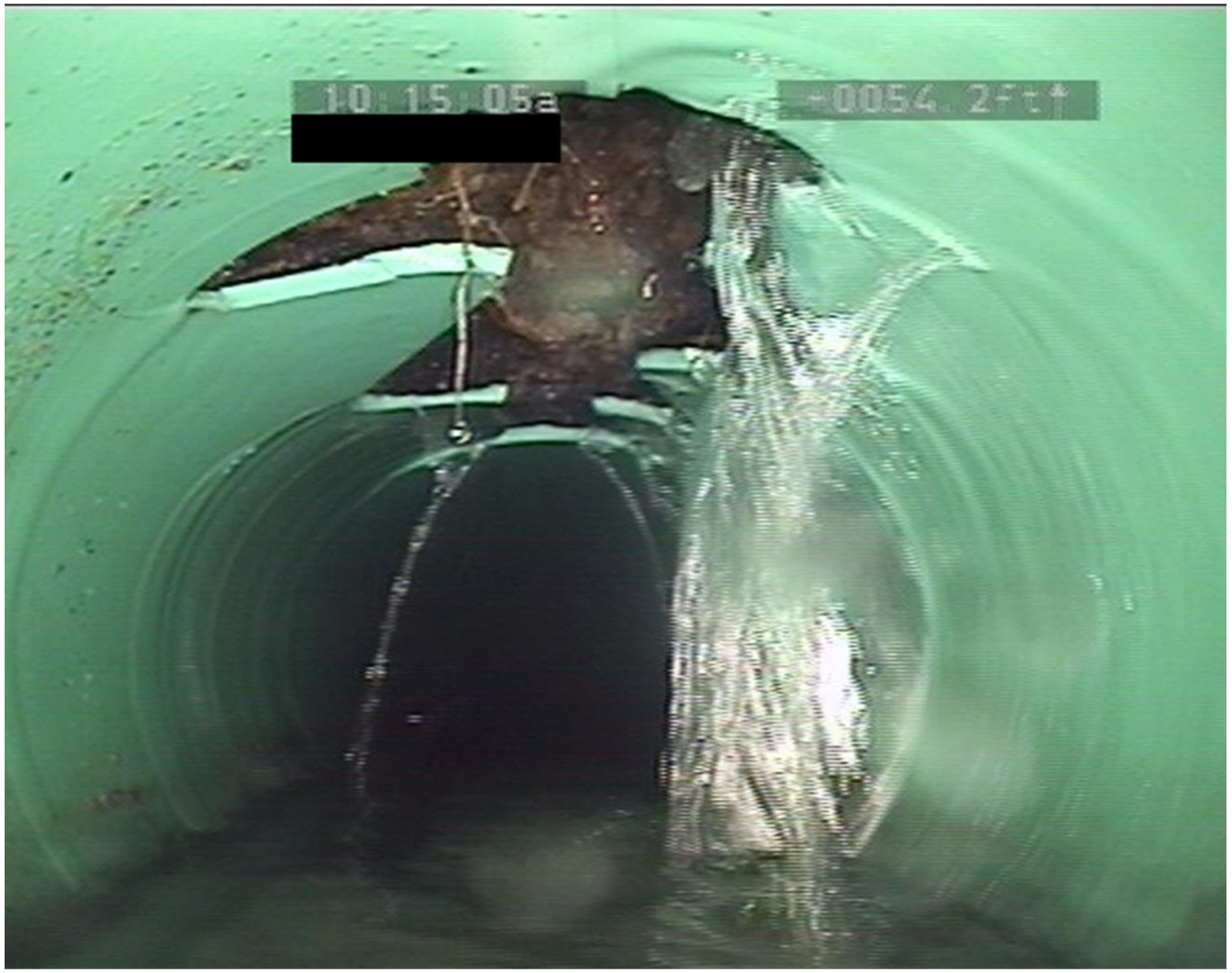


Scope & Use

1.3 This practice covers the “high-pressure water jetting” of vitrified clay pipe and should not be applied to other pipe and pipe lining materials without evaluating the recommended cleaning procedure from the manufacturer to avoid damage.

- **CLEANING**
- **LINING**
- **REPAIR**
- **CCTV**
- **OPERATIONS**
- **CONTRACTS**
- **TRAINING**

Scope & Use



“NOZZLES WITH FLAILING CHAINS, WIRES OR AGGESIVELY ROTATING NOZZLES SHOULD NOT BE USED”

Plastics Industry Pipe Association “Water Jet Cleaning of Plastics Pipe” POP 205

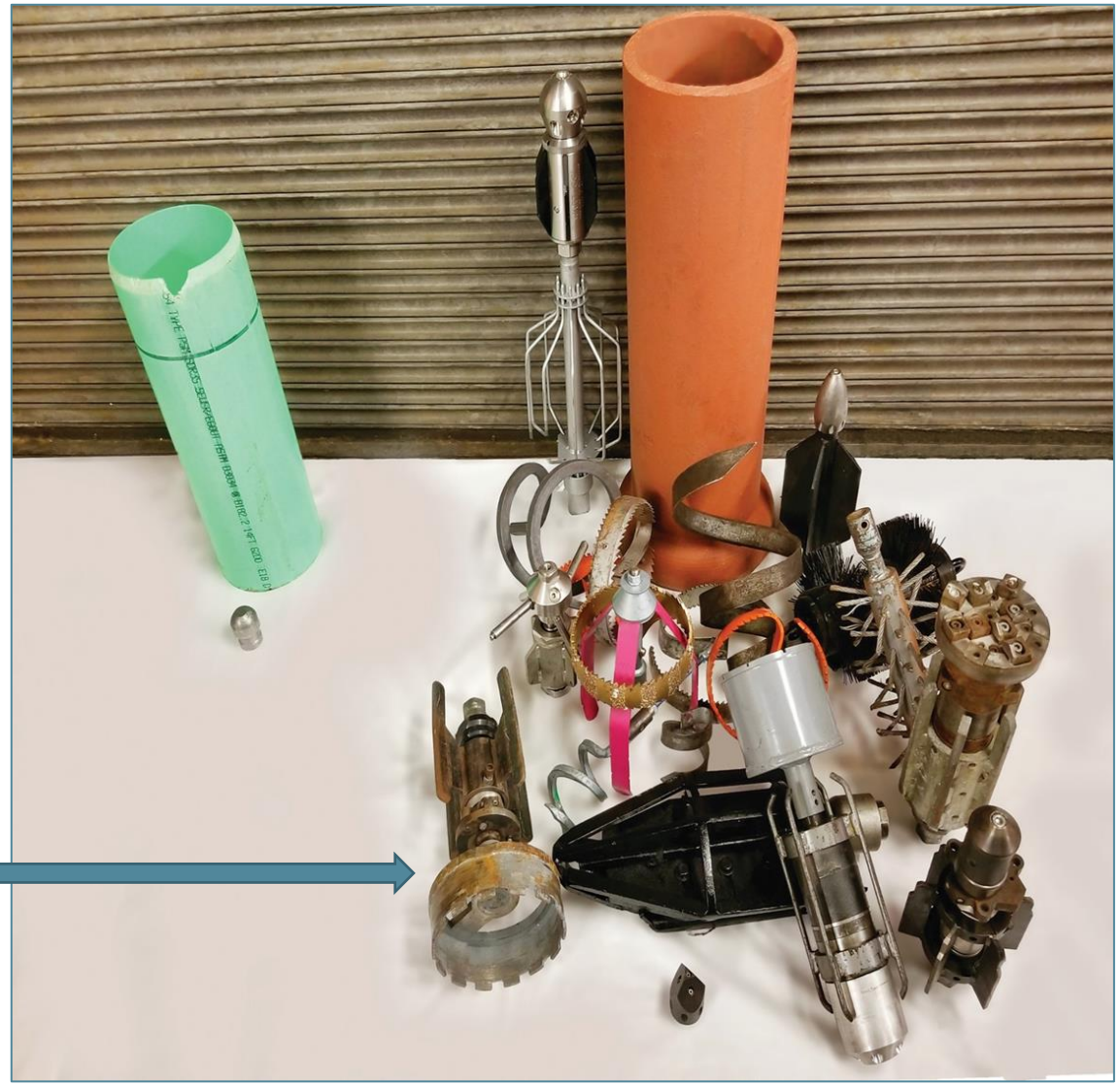
SECTION 2 – REFERENCED DOCUMENTS & STANDARDS

Hazards/Safety (Section 5 Implementation of Section 2)

- CDC STANDARDS: Health Risks
- DOT: HAZMAT Transportation
- OSHA: Worker Safety
- 29 CFR 1910.120: Hazardous Waste
- US EPA: **C**apacity **M**anagement **O**perations **M**aintenance
- MANUFACTURERS: Approved Cleaning Processes

SECTION 3 – SEWER CLEANING TERMINOLOGY

What is that called?



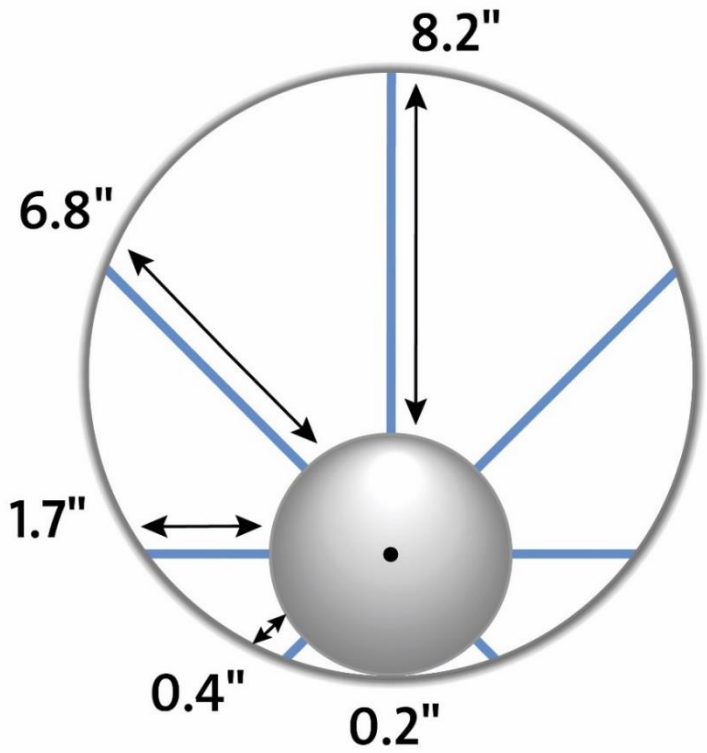
SECTION 4 – SIGNIFICANCE & USE

4.1 Hydraulic cleaning methods include equipment that uses water and water velocity to clean the invert and walls of the vitrified clay sewer pipe.

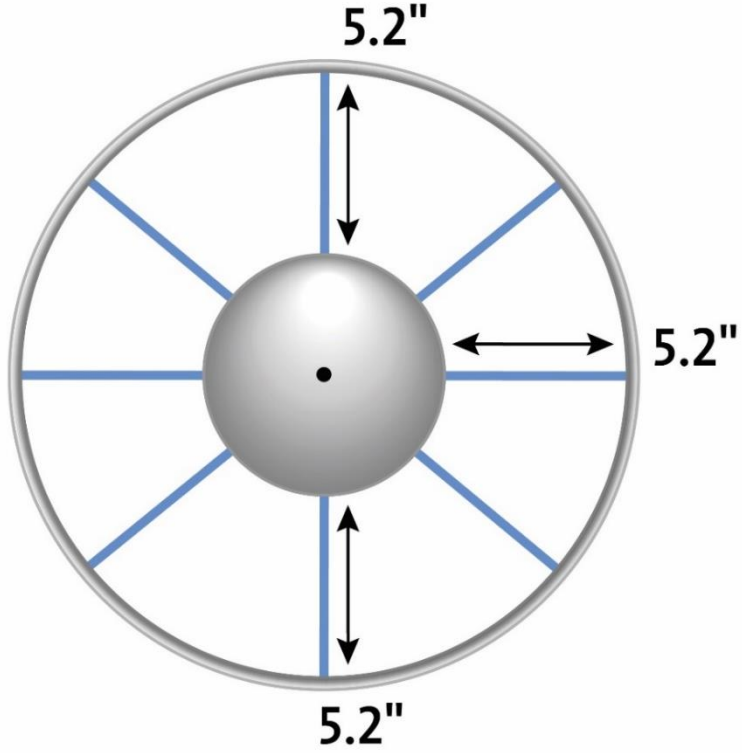
TOOLING MANUFACTURERS SOP

WATER JET STANDOFF DISTANCE COMPARISON*

*All measurements are approximate

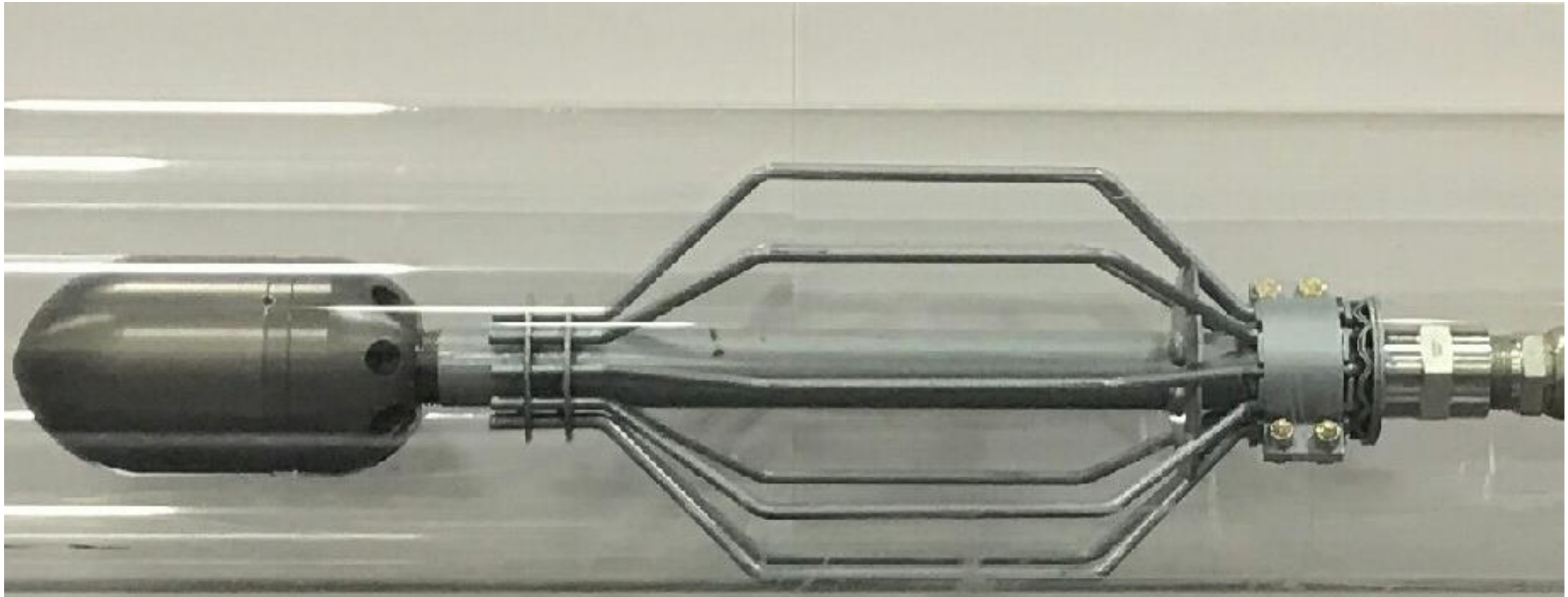


CATFISHED NOZZLE
8" PIPE, 30˚JETS

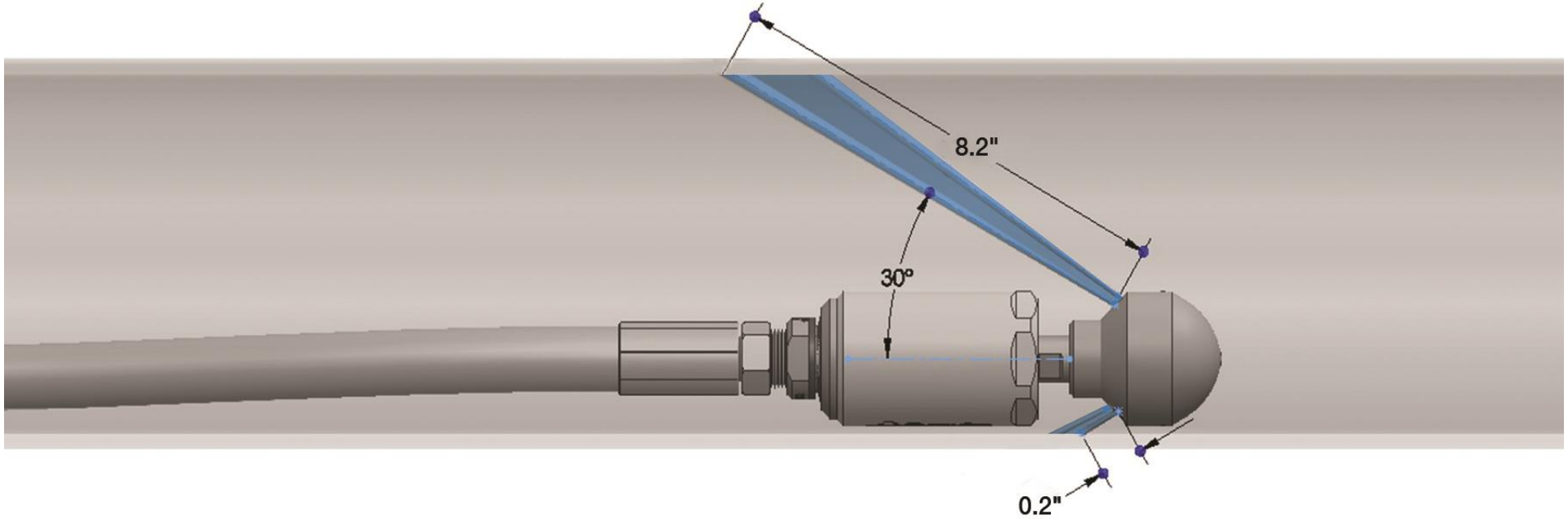


CENTERED NOZZLE
8" PIPE, 30˚JETS

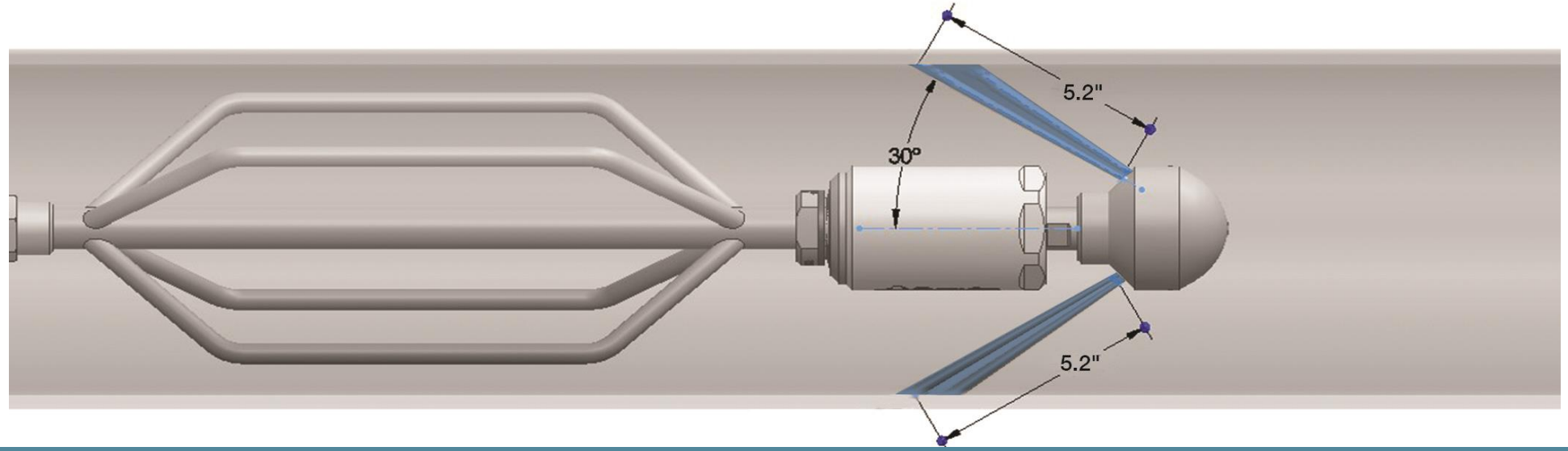
SECTION 7 – OPERATIONAL PROCEDURES



7.8 The nozzle shall be attached to a proofing skid calibrated to 95% of the inside diameter of the pipe to be cleaned. The skid will act as a go-no-go gauge to indicate that the pipe has been cleaned properly as it passes thru the pipe.



30° REAR FACING JETS, CATFISHING



30° REAR FACING JETS, CENTRALIZED

Static Nozzle Proofing Skid

SECTION 7 & 8 – OPERATION PROCEDURES

Morro Bay, California

Implementation of C1920-21 SOP's

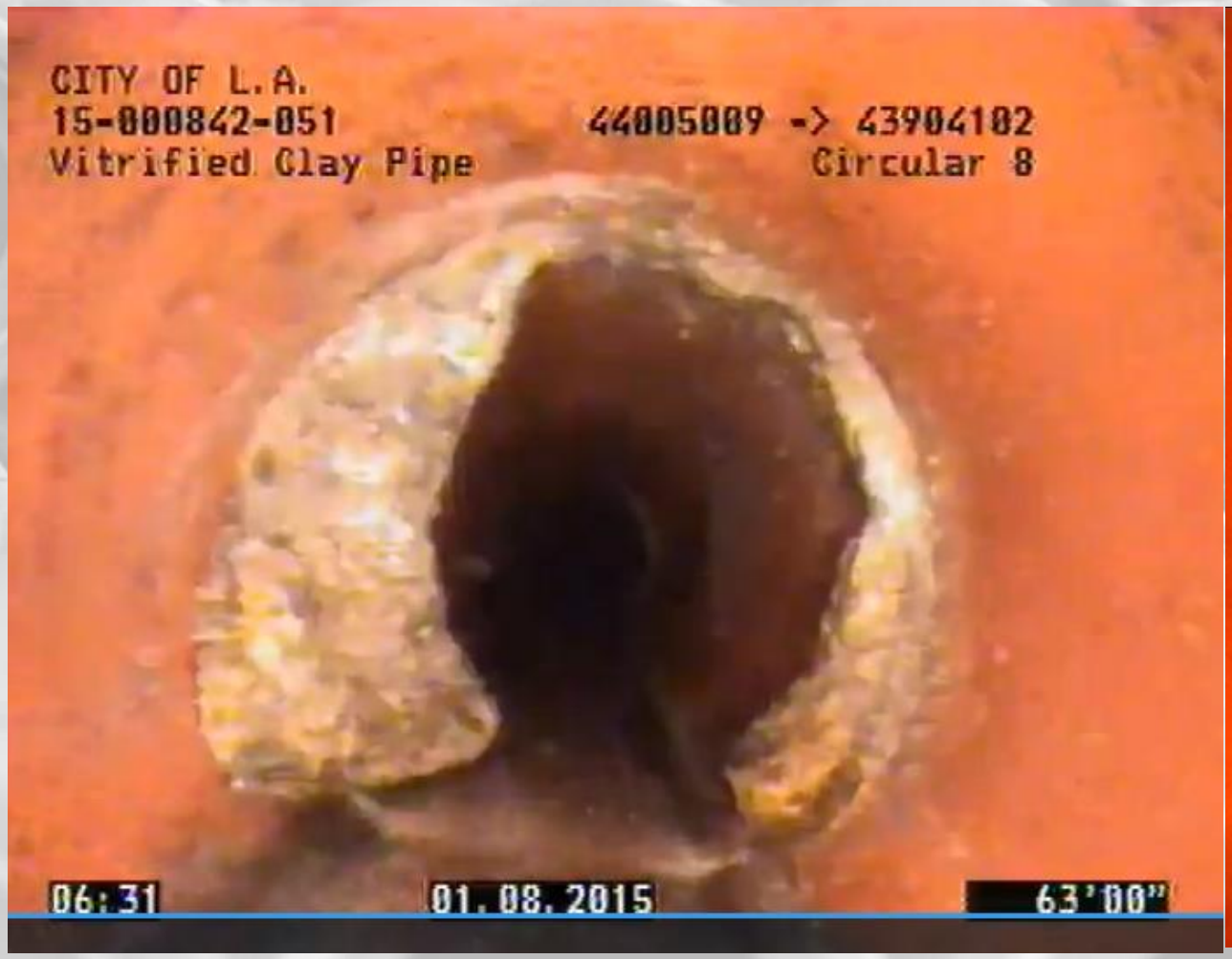
December 5, 2019

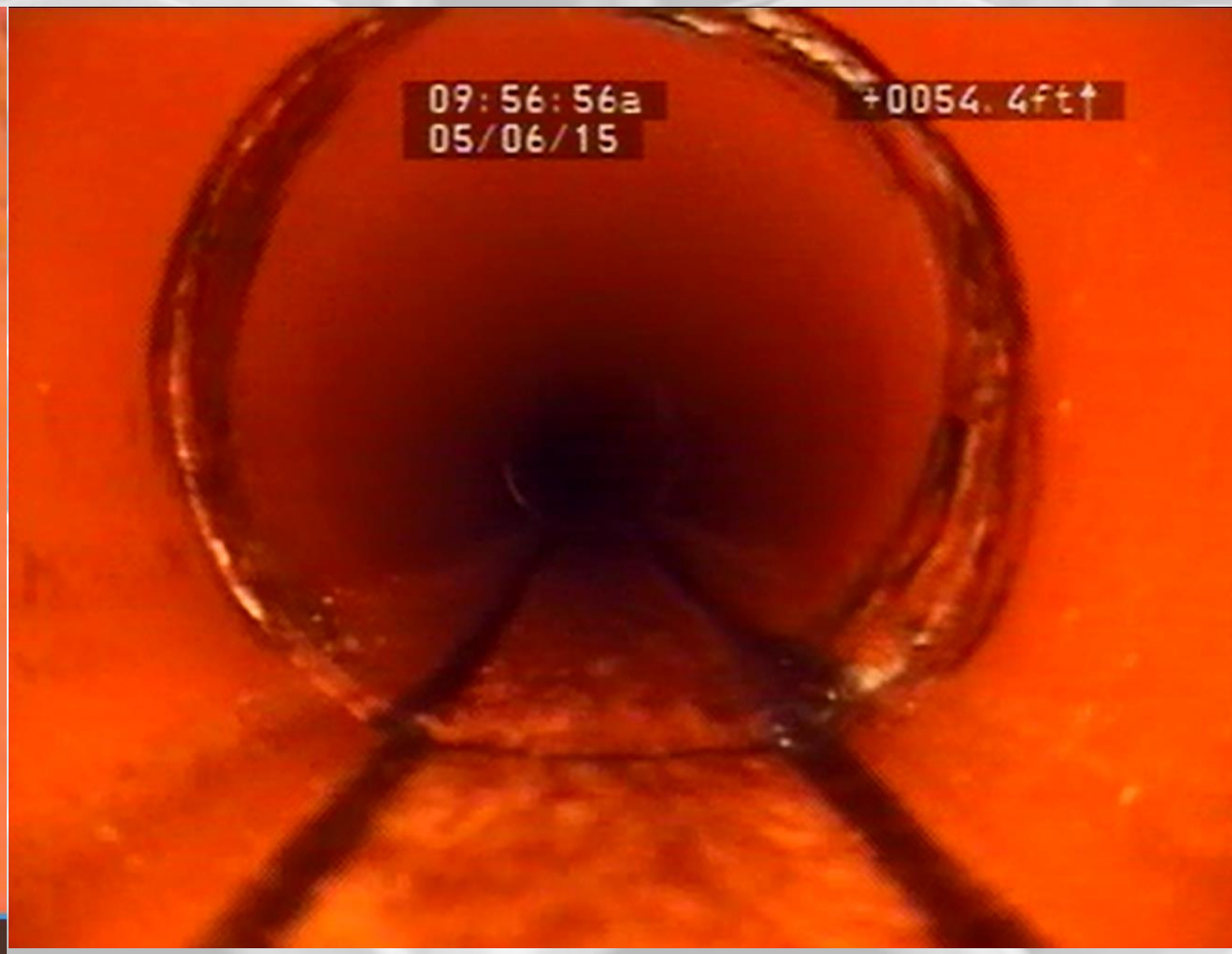
12-inch VCP

Installed **1954**

PROOFING SKID DEPLOYED WITH NOZZLE

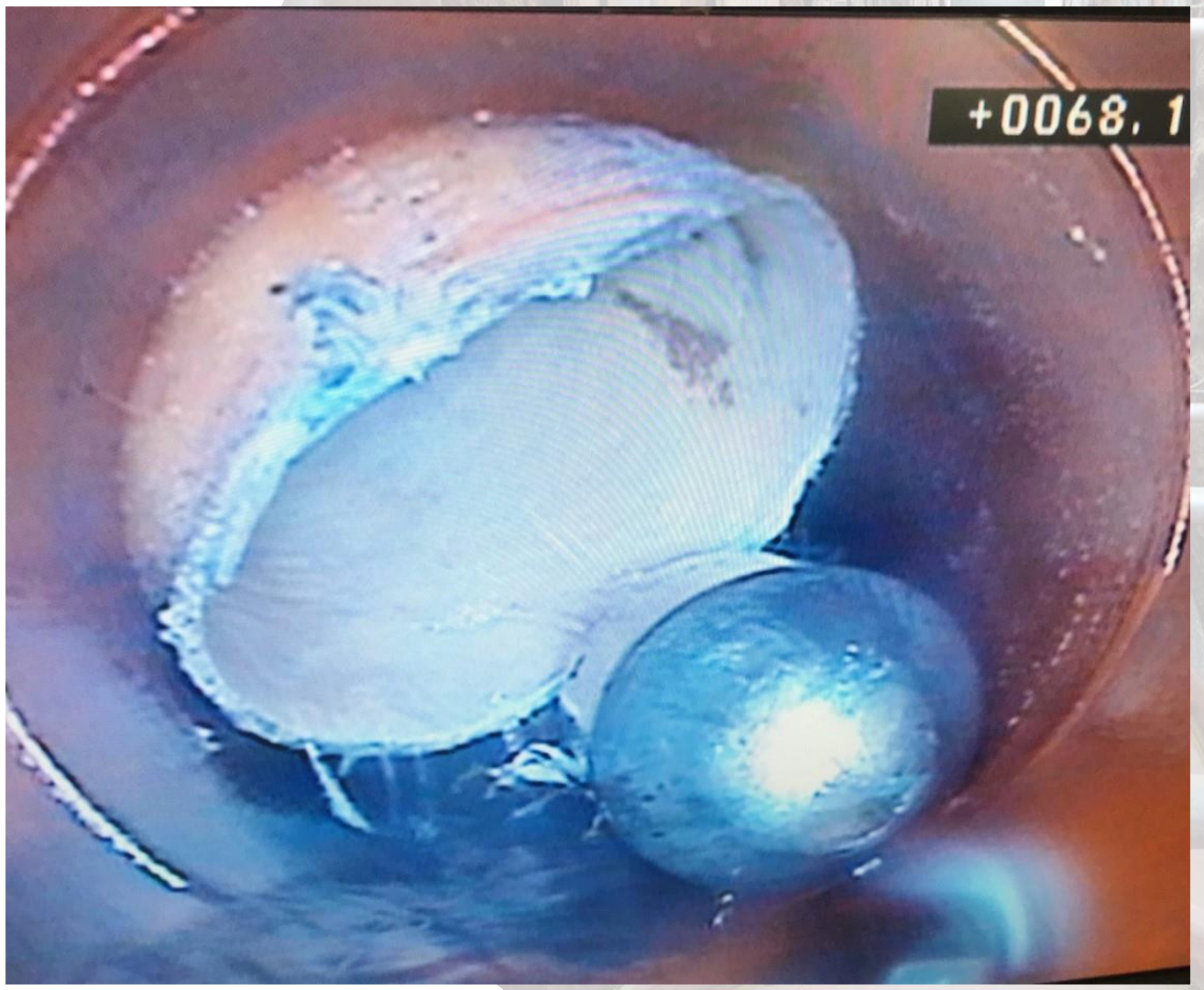
Mineral Deposits





NON-PERMITTED / ILLEGAL LATERAL REPAIR

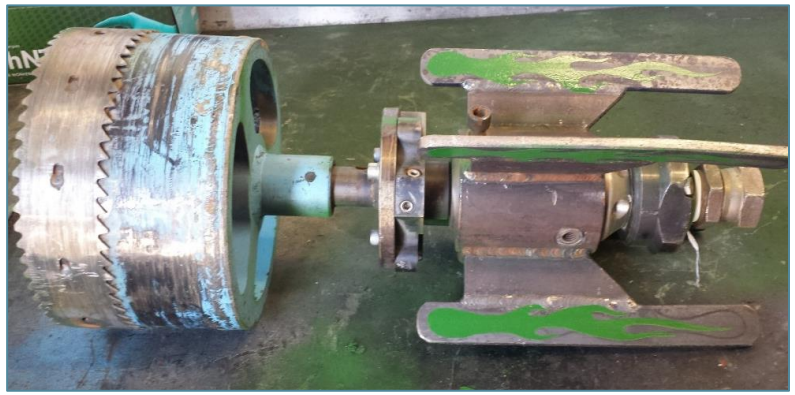
Nozzle stuck under protruding CIPP lateral



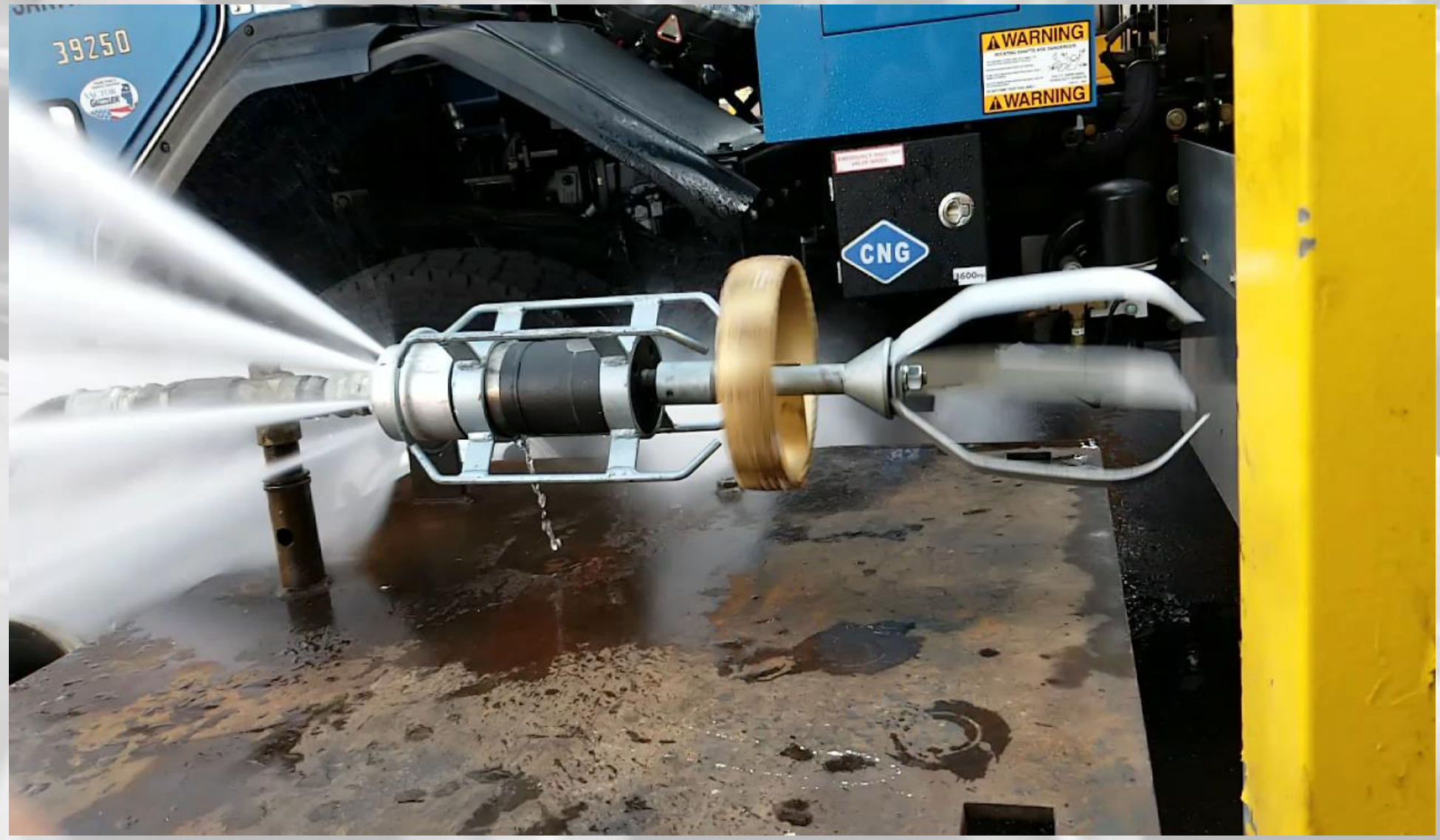
HYDRO-MECHANICAL CLEANING TOOLS

Can Cutter

- Removal of protruding CIPP Liner



HYDRAULIC ROOT SAW



HYDRAULIC ROOT SAW – BEFORE & AFTER

HYDRO-MECHANICAL FLAIL TOOL

22 INCH VCP

TOOL: K14 CHAIN CUTTER

CCTV /CLEANING DATE:
2013

PRIOR CLEANING DATE:
1977

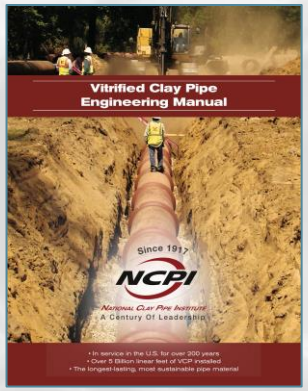
36 YEARS BETWEEN CLEANINGS

FAIRBANKS to DC to LA
6,700 MILES
(or 35.376 Million Linear Feet)

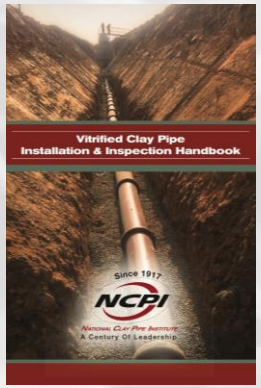
COAST TO COAST
2,800 MILES

QUESTIONS & DISCUSSION

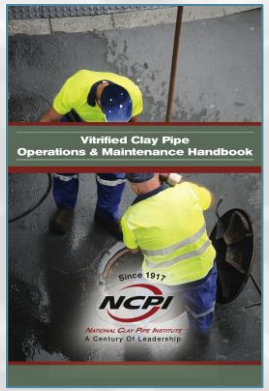
Publications Available from NCPI
Online or Hard Copy



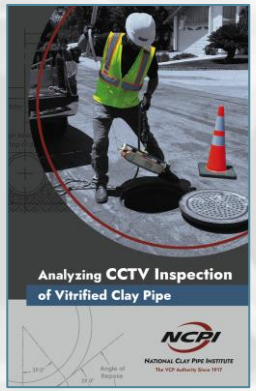
VCP Engineering Manual



VCP Installation & Inspection Handbook



VCP Operations & Maintenance Handbook



Analyzing CCTV Inspection of VCP

Low-Pressure Air Test Handbook

Tips for Installing VCP

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