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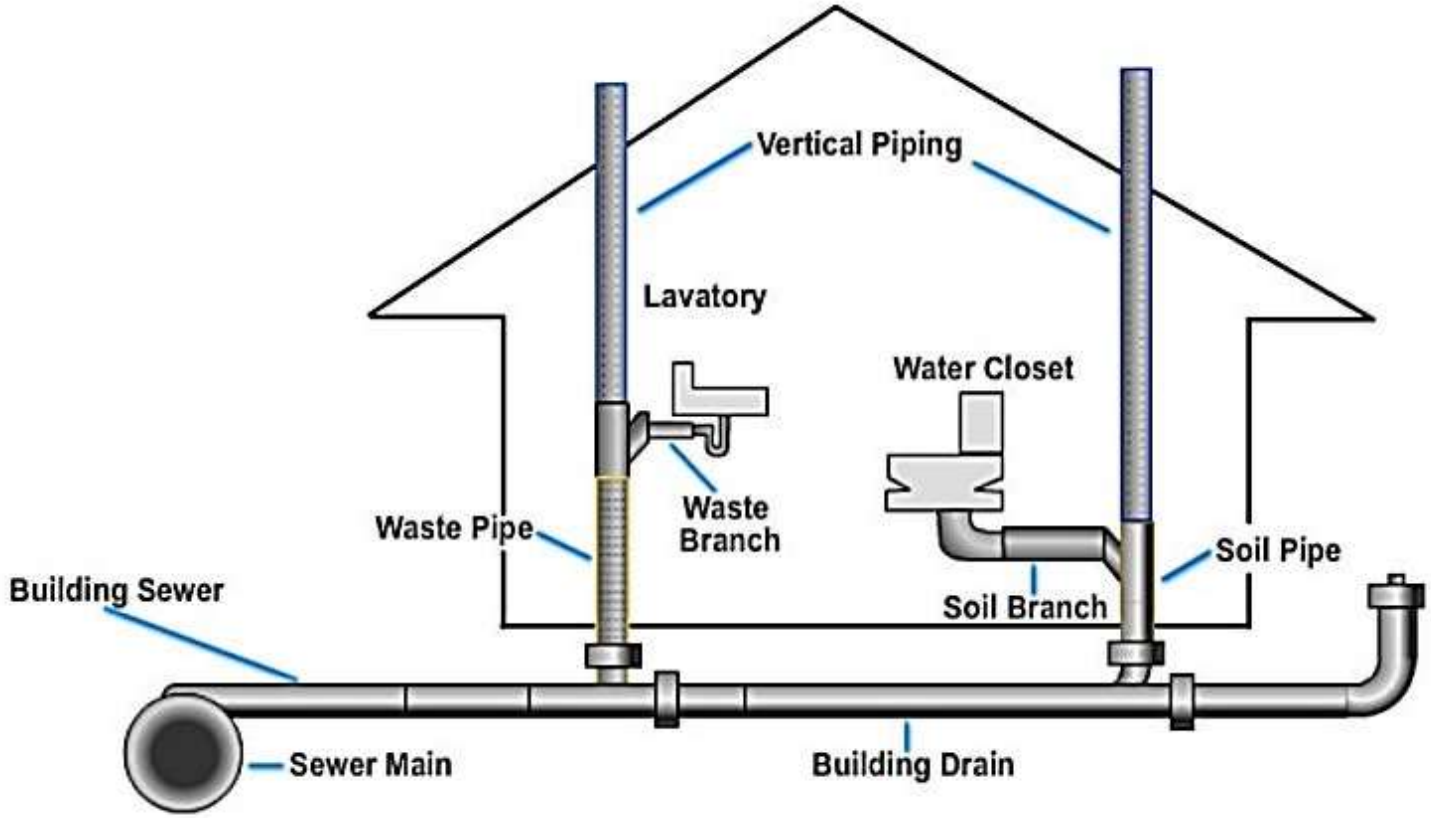
Update on Trenchless Methods in Plumbing Codes

Introduction

- Piping regulated by plumbing codes
- Trenchless methods
- Standards referenced for trenchless rehabilitation in plumbing applications
- Plumbing codes



Plumbing Applications with Trenchless Methods

- Building sewers – sanitary and storm
- Building drains – sanitary and storm
- Plumbing vents

Building Sewers

Sewer Laterals

- Conveys sanitary or storm sewage to the public sewer
- 18 in. to 2 ft outside the building extending to the public sewer or property line
- May include connection to public sewer
- Clay, cast iron, Orangeburg, PVC most common pipe materials
- Ownership and responsibility for maintenance typically held by property owner

Trenchless Methods for Building Sewers

- Pipe Bursting
- Cured-in-Place Pipe Lining (CIPP)
- Lateral to Main Connection Seal

Building Drains

- Conveys sanitary or storm drainage to the building sewer
- Inside the walls or below the slab of a building extending outside connecting with building sewer
- Cast iron, galvanized steel, ABS, PVC most common pipe materials
- Ownership and responsibility for maintenance held by property owner

Plumbing Vents

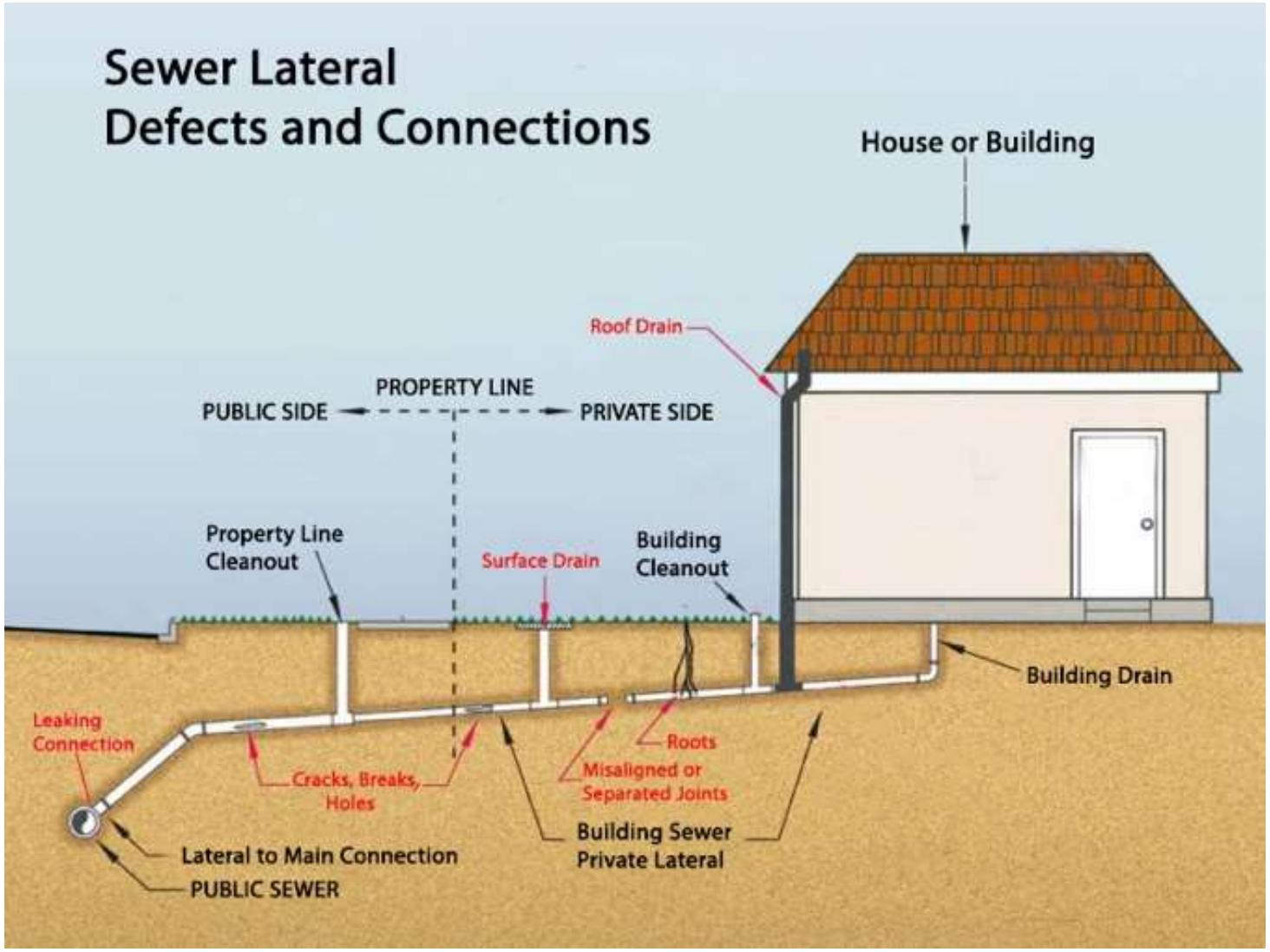
- Pipes inside the building provided to ventilate drainage system
- ABS, cast iron, PVC, steel most common pipe materials
- Ownership and responsibility for maintenance held by property owner

Trenchless Methods for Building Drains & Vents

- CIPP
  - Inversion installation
  - Push / Pull-in Place installation

Application Variables

- Access – Physical and Legal
- Diameters from 2” to 10”
- Multiple bends
- Diameter changes
- Offset joints
- Cracks
- Connections
- Grease and deposits
- Roots



Codes and Standards

- IPC
- UPC
- ICC-ES
- NSF 14 SE
- IAPMO

- ASTM F1216
- ASTM F1743
- ASTM F2561
- ASTM F3240
- ASTM F2599

ASTM Standards

Primary Standards for CIPP

- ASTM F1216
- ASTM F1743

Standards for Lateral Rehabilitation

- ASTM F2561
- ASTM F3240

Standards for Point/Sectional Repair

- ASTM F2599

Referenced Installation Standards

ASTM F1216 – Primary reference, installation by inversion method

- Mandatory language
- Inclusion of light cure
- Design

ASTM F1743 – Installation by pull / push-in method

- Inclusion of light cure

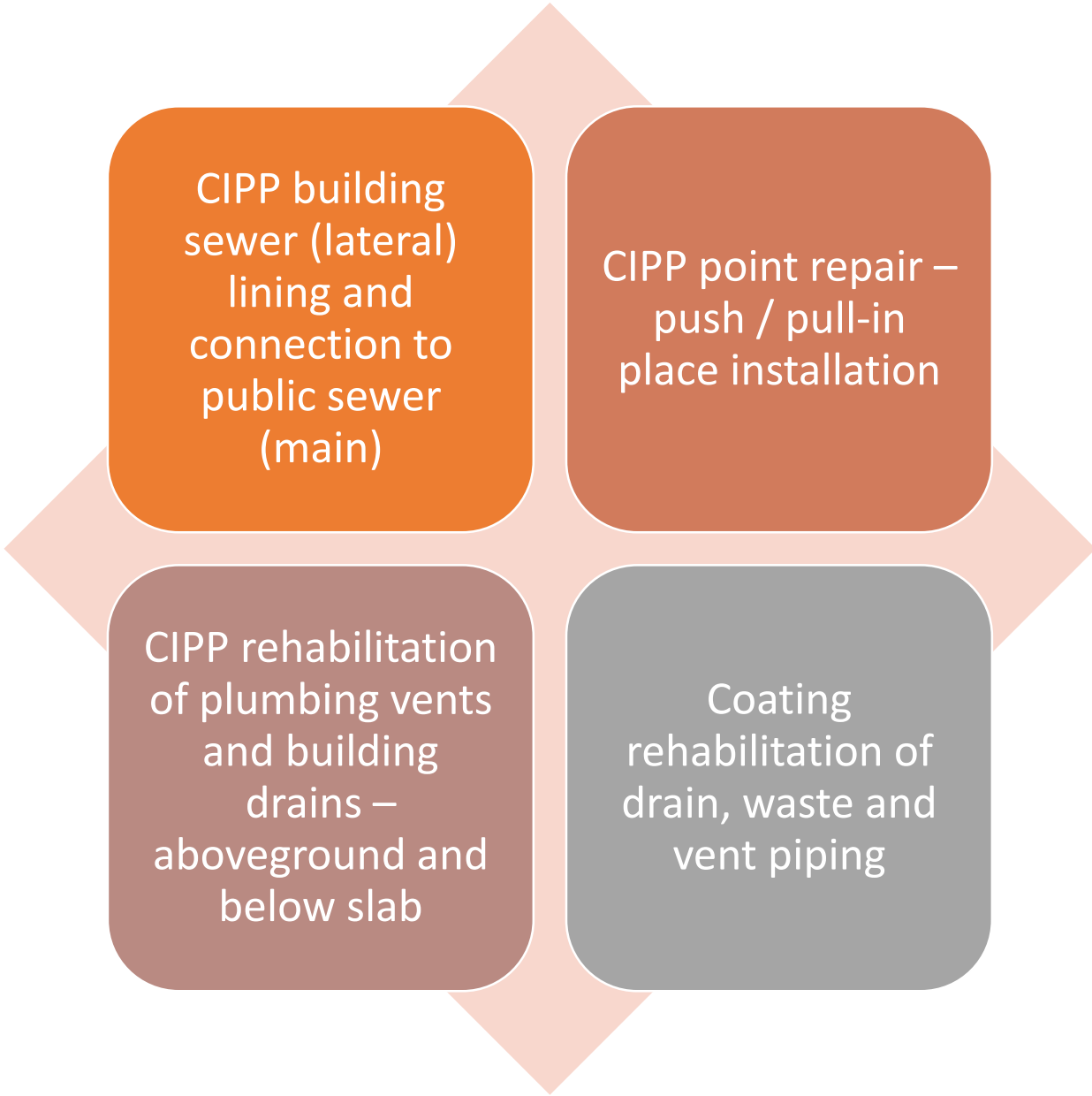
New Referenced Standards to Code

ASTM F2561 – Lining of building sewer (lateral) from the public sewer (main) using air inflation and inversion for installation. Uses hydrophilic gaskets and/or o-rings at terminations and lateral to main connection. Patent involved.

ASTM F2599 – Sectional CIPP repair of pipe using inversion. Uses hydrophilic o-rings at terminations. Patent involved.

ASTM F3240 – Requirements for the installation of hydrophilic gaskets and/or o-rings in CIPP rehabilitation, includes material testing. Patent involved.

Standards Under Development



Plumbing Code Adoption Map

IPC adopted at state or local level

UPC adopted at state or local level

- International Plumbing Code – IPC
  - Developed by ICC
  - Current Model Code – 2018
  - 2021 Development Cycle in final stage
- Uniform Plumbing Code – UPC
  - Developed by IAPMO
  - Current Model Code -2018
  - 2021 Development Cycle in final stage

International Plumbing Code

ICC Code Development

Existing Code 2018

- Section 105.2 – Alternative Materials
- Section 703.4 – Existing Building Sewers and Building Drains
  - Inspect, confirm slope, not broken, not obstructed, properly sized
- Section 716 – Replacement of Underground Building Sewers and Building Drains by Pipe-Bursting
- ICC-ES LC1011 – Rehabilitation of Existing Building Drains and Building Sewers
- NSF SE 13004 – Rehabilitation for Small Diameter Pipes

2021 IPC Proposals

- Section 717 – Relining Building Sewers and Building Drains
- Section 718 - Rehabilitation of Building Sewers and Building Drains

2021 IPC Proposed Change

Any cured-in-place rehabilitation of building sewer piping and sewer service lateral piping shall be in accordance with ASTM F2599. Any cured-in-place rehabilitation of building sewer and sewer service lateral pipe and its connection to the main sewer pipe shall be in accordance with F2561. All cured-in-place rehabilitation of building sewer piping and sewer service laterals shall include the use of hydrophilic rings or gaskets meeting ASTM F3240 to assure water tightness and elimination of ground water penetration.

Uniform Plumbing Code

IAPMO Code Development

Existing Code 2018

- Section 301 – Alternative Materials
- Section 715.3 – Existing Sewers
  - Petition to Board of Directors underway
- IAPMO IGC 321
- NSF SE 13004 – Rehabilitation for Small Diameter Pipes

2021 Development

- Petition to Board of Directors underway

Restrictive Content in 2018 UPC Model Code

715.3 Existing Sewers. Replacement of existing building sewer and building storm sewers using trenchless methodology and materials shall be installed in accordance with ASTM F1216. *Cast-iron soil pipes and fittings shall not be repaired or replaced by using this method aboveground or belowground. Replacement using cured-in-place pipe liners shall not be used on collapsed piping or when the existing piping is compromised.*

Petition to Remove Restrictive Content

Cast-iron soil pipes and fittings shall not be repaired or replaced by using this method aboveground or belowground.

- CIPP has been used to rehabilitate cast iron sewer pipe for over 40 years with substantial documentation and research proving its effectiveness.
- CIPP offers the public a benefit that minimizes hazards by lessening the need to excavate and damage/disrupt existing utilities.
- Trenchless methodology is an advanced art of safeguarding both property and life that when used to rehabilitate deteriorating or damaged cast iron building sewers minimizes economic, social and environmental impact.

Replacement using cured-in-place pipe liners shall not be used on collapsed piping or when the existing piping is compromised.

- Conflicting text with referenced standard ASTM F1216.
- The original pipeline should be clear of obstructions such as solids, dropped joints, protruding service connections, crushed or collapsed pipe, and reductions in the cross-sectional area of more than 40 % that will prevent the insertion of the resin-impregnated tube. If inspection reveals an obstruction that cannot be removed by conventional sewer cleaning equipment, then a point repair excavation should be made to uncover and remove or repair the obstruction.

Local Jurisdictions

- Capability to amend model code to remove restrictions
- Awareness of benefits of methods and materials
- Understanding of quality controls used by installer
- Manufacturer / Supplier training and technical support

2021 UPC Proposed Change

715.3 Existing Sewers. Replacement of existing building sewer and building storm sewers using trenchless methodology and materials shall be installed in accordance with ASTM F1216, ASTM F2561, ASTM F2599, or ASTM F3240. Cast-iron soil pipes and fittings shall not be repaired or replaced by using this method aboveground or belowground. Replacement using cured-in-place pipe liners shall not be used on collapsed piping or when the existing piping is compromised.

Certification Entities

- ICC-ES
  - ICC-ES LC1011 – Rehabilitation of Existing Building Drains and Building Sewers
- NSF
  - NSF-14 SE 13004 – Rehabilitation for Small Diameter Pipes
  - NSF-14 SE 10990 – Rehabilitation by Point Repair of Existing Pipe
- IAPMO
  - IGC 321

Resources

NASSCO – NASSCO.org

- *Overview of Lateral and Main/Lateral Connection Lining and Sealing Technologies*
- Tech Tips and Specification Guidelines
- Certification and Training courses for inspection

NASTT – nastt.org

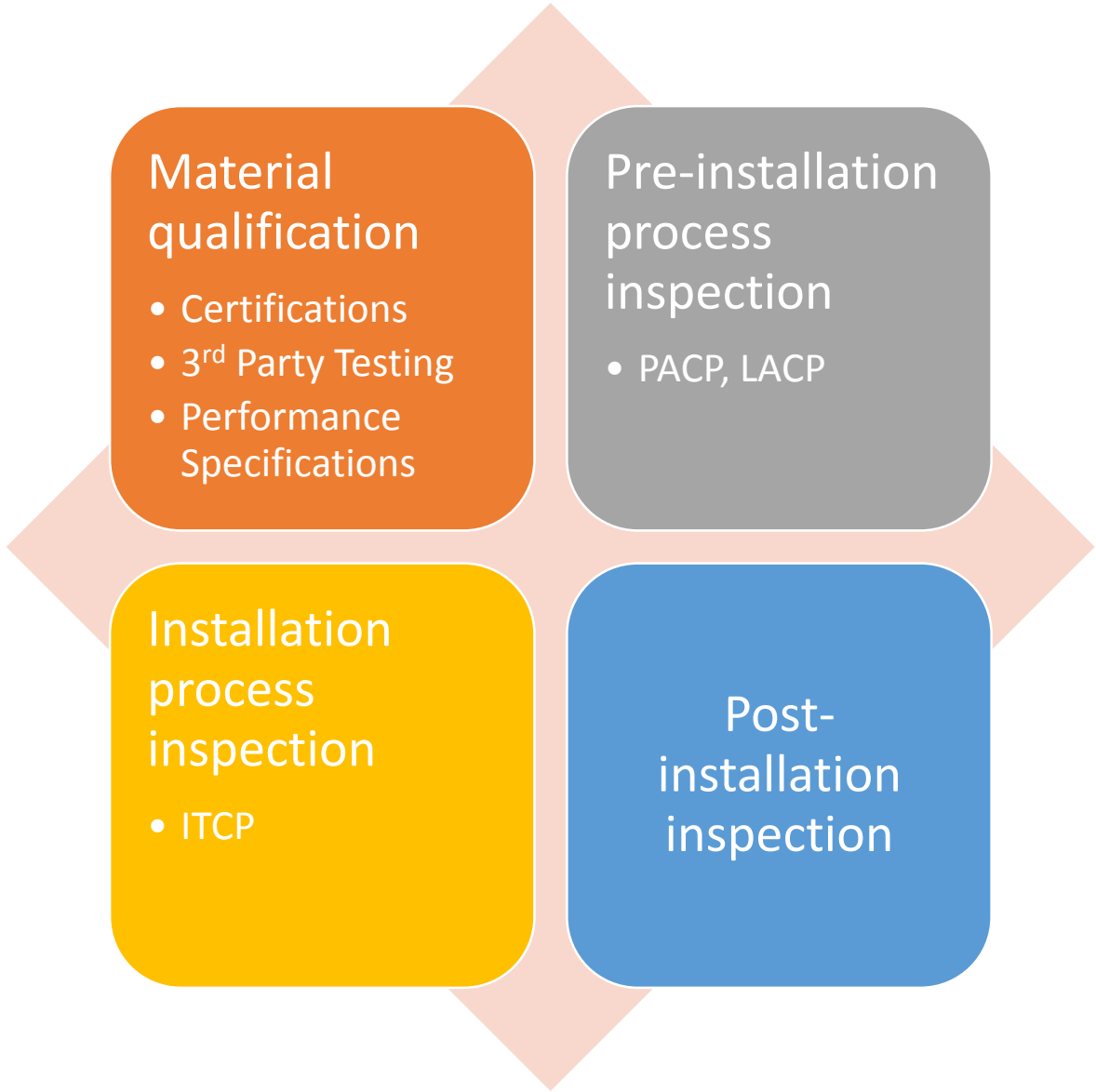
ASCE – UESI Pipelines Infrastructure

- Manuals of Practice

WERF Studies

- *Methods for Cost-Effective Rehabilitation of Private Lateral Sewers*

Quality Assurance / Quality Control Practices



Challenges & Solutions

Before	Evaluating application specification and conformance to relevant Code
During	Addressing installation issues
After	Resolving post-installation defects

Future Outlook

- Training and education
- Awareness
- Code development

Lateral Rehabilitation Committee

Plumbing Code Workgroup

Organization with mission to develop educational documents for the purpose of advancing lateral technologies by working with local and state health departments and plumbing boards, plumbing code development and enforcement entities, certification and quality control organizations in an effort to gain further acceptance of these technologies

Questions??