To Dig or Not Dig, That is the Question

City of Roseville Use of CIPP

City Engineers Association of Minnesota

January 30, 2019
City of Roseville Use of CIPP

Outline

• What is CIPP?
• History of CIPP in Roseville
• CIPP Specifications
• How to get the most out of CIPP projects?
• Cost of CIPP
• Inflow and Infiltration
What is CIPP?
- Cured In Place Pipe
- Trenchless pipe rehab method

Process
- Pipe is cleaned and televised
- Existing flow must be bypassed
- Uses textile liner and resin
- Liner is impregnated with epoxy based resin
- Material is inverted into the pipe
- Pipe is cured using steam, hot water or ultra-violet light (UV)
- Services are reinstated
- Typically takes 4-8 hours depending on pipe size
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What is CIPP?

Why is it used?
- Minimal impacts to residents
- No surface restoration
- Eliminates joints
  - Eliminates roots
  - Reduces maintenance
- Can eliminate unused services
- Reduces infiltration
- Improves the integrity of the pipe

When can’t it be used?
- Major offset joints
- Major belly in pipe
- Breaks in the pipe

These areas need to be repaired before they can be lined.
Why does Roseville use CIPP?
- Pavements are in mill and overlay cycle
  - Minimal street reconstructions
- Most sewer is 60 years old
- Most of the system is clay tile pipe
- Poor soils and high ground water in most areas
- Very cost effective verse traditional open cut
- Have used CIPP for some storm sewer where it was cost effective to line versus open cutting.

What is CIPP?

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**Roseville Sanitary Sewer Inspection**

- Televise every 10 years or as needed to determine pipe condition
- Use a contractor for annual televising
  - All work must be done in accordance NASSCO Pipeline Assessment Certification Program (PACP)
  - All operators must be certified
  - Data must be provided in unmodified PACP NASSCO EXCHANGE format

**Roseville Sanitary Sewer Maintenance**

- Perform jetting on all lines every 3 years on a rotating basis
- Additional cleaning for problem lines such as grease lines.
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History of CIPP in Roseville

CIPP Lining Priorities
- High impact areas
  - Major crossings
  - Locations that would be very difficult to dig
- Pipe condition based on televising or Public Works feedback
  - Sewer backups
  - Numerous roots
  - Cracked pipe
- Infiltration
  - High flow areas based on flow monitoring or televised observation
- Pavement Management Areas
  - Goal is to line all clay tile pipe prior to mill and overlays
Roseville Sanitary Sewer System
- Original System
  - 145.4 miles of pipes
  - 78% of the pipe installed between 1956-1961
- Roseville CIPP
  - Began lining in 2004
  - Have lined 54.36 miles of pipe
  - Annual budget of $850,000 for sanitary lining
  - 5-6 miles of pipe per year depending on size and location
  - Projected to have system fully lined in 15-18 years with current budget
    - Can do a more neighborhood approach
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CIPP Specifications

- Use CEAM Standard Specifications
- Specify a full structural liner
- Allow both steam and water cure
- Special Provisions
  - City eliminates 1 year warranty post televising requirement
  - Differentiate between street access and easement access
    - Typically pay $1-$2/LF more for easement access
  - Reopen service connection – separate bid item
  - Bypass pumping, televising, cleaning, traffic control – included with CIPP item by linear foot.

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**Totals for Project 19-06**
- $952,301.00
- $558,265.45
- $917,718.00
- $974,229.10

**% of Estimate for Project 19-06**
- 10.84%
- 4.85%
- 11.98%
In Pavement Management Areas we inform resident in the Fall
  • Give option for them to replace sanitary sewer service
  • If resident line their private service, it is better to line service before the main
• Send general project newsletter when contract is awarded
  • Explain process
    • Explain water usage during lining
    • Impacts
    • Schedule
    • Contacts
• Contractor hangs door hangers ahead of lining
  • 24 hours minimum for residents
  • 72 hours minimum for businesses
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How to get the most out of CIPP projects?

- Create larger CIPP projects
  - City of Falcon Heights Cooperative Construction Agreement for 2019 Project-
    $185,000 – Construction Costs
    - Approximately 10% savings to Falcon Heights by combining with a larger contract
    - Roseville performs design, inspection, contract administration.
      - Prorate costs
    - Falcon Heights approves project scope prior to bid
    - Bid costs come in more than 20% over estimate Falcon Heights Council must approve bid.
    - Change orders over 5% must be approved by Falcon Heights.
    - Roseville invoices Falcon Heights and invoice must be paid within 30 days.

- Advantages of Cooperative Agreement
  - Larger project saves contractor cost
  - Only one contract to administer saves engineering costs.
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How to get the most out of CIPP projects?

• Bid early and provide adequate time for completion
  • Typically bid in November with final completion in September of the following year
• Provide as much pipe information as possible to contractors
  • Televising videos
  • Provide options for bypassing high traffic areas such as storms sewer pipes
• Perform long segments instead of spot segments
  • Contractors can line through manholes and save on setups
  • Minimizes sanitary sewer bypassing
• Identify daycares, schools, senior care facilities and other businesses that are impacted by water shutoffs
  • Allow night work in these areas
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Cost of CIPP

Cost of Lining 8" Pipe

Sewer Lining Costs

- Cost of lining has been very stable and competitive
- Roseville typically has 5-6 bidders
- Cost usually less for larger projects
- Very cost effective compared to open cutting
Flow Monitoring
• Goal to find areas of high inflow and infiltration (I&I)
• Studied all areas of the City in 2017 with 18 flow meters
• Continued to monitor 10 highest peak areas in 2018 and will continue into the future

Use of Study Data
• Determine areas to prioritize CIPP
• Use to focus sump pump enforcement
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Effects of CIPP in Reducing Infiltration

Sanitary Flow Monitoring Data
• Roseville has seen a reduction in peak flow

• Has not gone over Met Council peak rate since 2014

• Goal is to keep ahead of future peak rate reductions by met council

• Overall annual rainfall is increasing so addressing I&I is getting more important
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Effects of CIPP in Reducing Infiltration

Annual Rainfall (inches)

State Climatology Office – Annual Rainfall for Ramsey County
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Questions?

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