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Financial Intelligence of Pipe Bursting

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Overview

- The Cost Benefits of Pipe Bursting
  - What Impacts the Cost of Pipe Bursting
  - Where The Savings Are
- The Comparison of Pipe Bursting to Other Trenchless Rehabilitation Techniques
  - The Cost Position of Pipe Bursting Versus the Other Methods in a Perfect World
  - What Conditions Change the Cost Comparison
- When Life Cycle Costs Are Considered Pipe Bursting Does Very Well
  - Knoxville Utility Board Example
  - Jacksonville (FL) Electric Authority (JEA)
  - Houston

The Cost Benefits of Pipe Bursting

What Impacts The Cost of Pipe Bursting

- Pits
  - Couplings
  - Connections to the Manhole
  - Backfill Material
  - Asphalt/Concrete Restoration
  - General Surface Restoration
  - Run Length = Costs Per Foot for Pits

The Cost Benefits of Pipe Bursting

- What Impacts The Cost of Pipe Bursting
  - Productivity = Labor/Equipment
    - How many feet can be installed per day on average
      - Run Length - Average Length – The Longer the Average Run, The More Footage Installed for Each Burst
      - Obstacles to Productivity
        - Depth
        - Public
        - Traffic Control
        - Layout
        - Type of Material
          - Material to be Installed
          - Existing Material to be Replaced
        - Static or Pneumatic (Reversible Tools)

The Cost Benefits of Pipe Bursting

- What Impacts The Cost of Pipe Bursting
  - Soil Conditions
    - Sand
    - Mucky Soils
    - Hard Pan
    - Water
    - Risk

The Cost Benefits of Pipe Bursting

- What Impacts The Cost of Pipe Bursting
  - Pipe Material Costs (As of January 2017)
    - HDPE - 8” = $9 Per LF
    - Fusible PVC - 8” = $15 Per LF
    - Restrained Joint PVC - 8” = $18 Per LF
    - Restrained Joint Ductile Iron Pipe - 8” = $40 Per LF

The Cost Benefits of Pipe Bursting

- Where Are the Savings (Open Cut) – (South Eastern Conference)
  - Labor
  - Bedding Material = $13 Per LF
  - Backfill Material = $70 Per LF (for 10’ Deep 5’ Wide)
  - Asphalt Restoration = $45 Per LF (for 6’ Wide 4” Thick)
  - Concrete Restoration = $50 Per LF (for 6’ Wide 4” Thick)
  - Yard Restoration = ?
  - Yards with Many Improvements = ?
- Where Aren’t the Savings
  - Open Yards/Fields with Few Improvements

The Comparison of Pipe Bursting to Other Trenchless Rehab Techniques

- No Other Trenchless Method Can Upsize An Existing Line
  - When Upsizing is Required – It's Pipe Bursting Or Open Cut

- No Other Trenchless Method Can Offer New Pipe
  - Only Pipe Bursting & Open Cut Offer New Pipe – Replacement Not Rehabilitation
  - Pipe Has 100 Year Design Life

Pipe Has 100 Year Design Life – Study Conclusions

- The conclusions of the study concern the LCA-results for the comparison of the ductile iron pipe system for water distribution with the PE pipe system for water distribution, from the cradle to the grave: from the primary extraction of raw materials, up till the final disassembling and EoL treatment of both pipe systems at the end of their service life (100 years).
- General operating data was obtained from four water utilities distributed throughout the United States (California, North Carolina, Florida and Indiana). This data was used in conjunction with the models developed to project performance at their specific operating conditions. As the model projections are specific to the operating conditions of these specific utilities, an analysis was also conducted for a model average utility. To simplify the analysis, the calculations were based on size DR11 piping and the results were not scaled for pipe size. This is a conservative approach as testing was conducted on small diameter tubing, which would be considered a 'worst case' size. Two separate datasets were analyzed for the high-performance materials and the average of the results is presented. Because the testing is in progress, extrapolations beyond one hundred years are conservatively represented as >100 years. For all of the case studies presented the extrapolations are in fact, considerably greater than 100 years.

The Comparison of Pipe Bursting to Other Rehab Options

- The Cost Position of Pipe Bursting Versus the Other Methods in a Perfect World – (South Eastern Conference)
  - CIPP - $25-$35 (8”) Per LF
  - Pipe Bursting - $35-$50 (8” HDPE) Per LF
  - Open Cut In Easements - $80-$120 (8” PVC) Per LF
  - Open Cut In Roadways - $150-$200 (8” PVC) Per LF
    - Including Bedding/Backfill/Asphalt

The Comparison of Pipe Bursting to Other Trenchless Rehab Options

- The 6” Problem
  - 6” CIPP is More Problematic Than Larger Sizes for CIPP Contractor
    - Offset Joints
    - Trenchless Service Reinstatement Not Typically Available
      - Services Must Be Dug
    - CIPP - $35-$50 (6”) Per LF
- The 6” Solution
  - Pipe Bursting - $35-$50 (8” HDPE) Per LF
  - Generally Speaking We Can Pipe Burst that 6” to 8” For About the Same Price as CIPP
  - New Pipe w/ 100 Year Design Life

The Comparison of Pipe Bursting to Other Trenchless Rehab Options

- What Conditions Change the Cost Comparison
  - For CIPP
    - Point Repairs – Typically 1 or Two Point Repairs @ $2500 Each Would Make Pipe Bursting More Economical = $10 Per LF on 250' Section – Point Repairs Rarely Impact Pipe Bursting Costs
      - Lake City, TN – Set Up 2 Point Repairs on Each Line Segment and Specified CIPP
  - Other Impacts
    - Heavy Cleaning will have a Negative Cost Impact On CIPP – Not on Pipe Bursting
    - Active Infiltration will have a Negative Cost Impact on CIPP – Not on Pipe Bursting
    - If Services Do Not Exist or Are Ignored (Internally Reinstated) CIPP will Dominate
      - Reconnecting Services Will Cost Between $1,200-$2,500 (Same for Both CIPP or Pipe Bursting

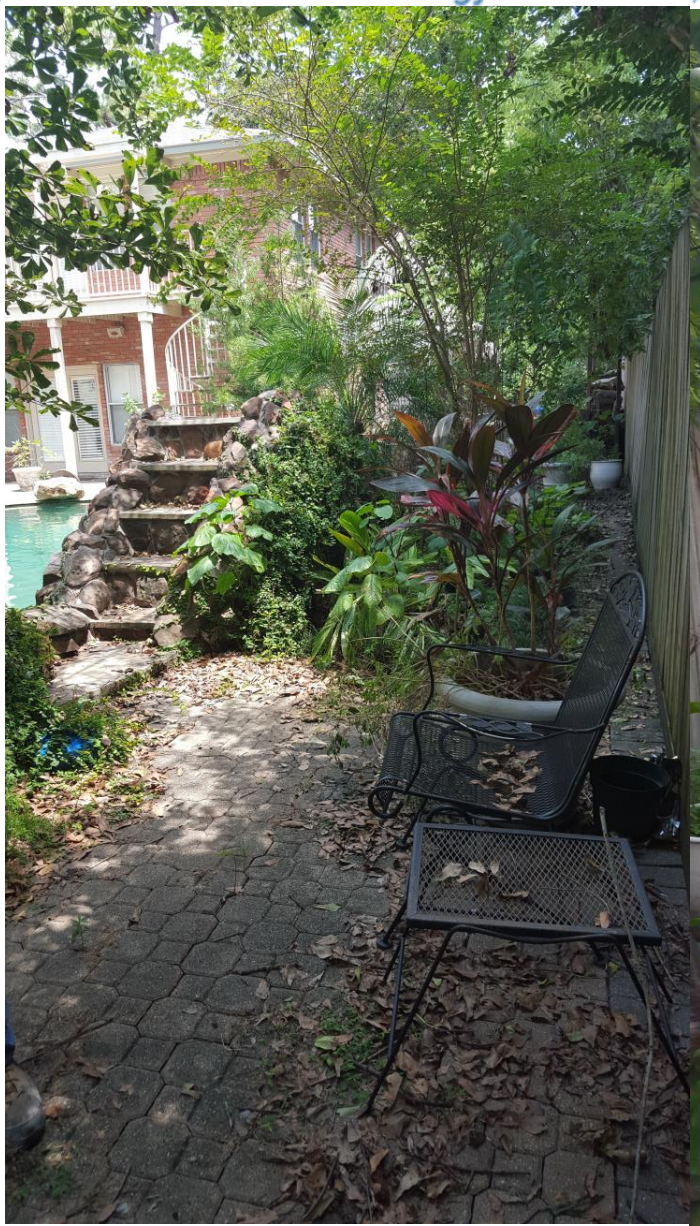
No Impact On The Cost of Pipe Bursting

No Impact on The Cost Pipe Bursting

Point Repair Required – Even for Pipe Bursting

The Comparison of Pipe Bursting to Other Trenchless Rehab Techniques

- Feasibility of CIPP Vs Feasibility of Pipe Bursting
  - Each Technology Has Its Limitations
    - Scenarios You Can't Line
    - Scenarios You Can't Burst
- Back Yard Easements In Houston
  - When Access Is Very Difficult We Suggest Lining
  - Sometimes The Lining Option is Feasible
  - Many Times Lining Simply Isn't an Option (See Subsequent Examples)



The Comparison of Pipe Bursting to Other Trenchless Rehab Techniques

- Cost Impact When Little Information is Available - No CCTV Investigation
  - CIPP – Heavy Roots, Active Infiltration, and Point Repairs could be Budget Breakers
  - Pipe Bursting – Heavy Roots, Active Infiltration, & Point Repairs will Have little Impact on Pipe Bursting Costs

- Many Places Choose Pipe Bursting Over Lining For Simplicity (When Little Information is Available About)

When Life Cycle Costs Are Considered Pipe Bursting Does Very Well

- Pipe Bursting & Open Cut Can Install Products with 100 Year Design Lives
- CIPP Can only Provide 50 Year Design Life
- Many Programs Favor Whichever Method is Cheaper Today
- Many Programs Favor Whichever Method is Cheaper Over the Product Life Cycle – Pipe Bursting
- Many Programs Use A Hybrid of Ideologies
  - Pipe Bursting When Possible
  - CIPP When Necessary (If Feasible)
  - Open Cut When Necessary
    - Knoxville Utility Board (KUB)
    - Jacksonville Electric Authority (JEA)
    - Houston, Texas

KUB Program – Experiment

- 3 Projects – Rehabilitating Pipe & Replacing All Services
  - Bid CIPP Option
    - Added An Appropriate Amount Of Point Repairs
  - Bid Pipe Burst Option
    - Added More Asphalt to Cover Pipe Burst Pits
- Results
  - CIPP Option Was Low by an Average of 10% for the 3 Projects
  - On the 3rd Project They Awarded the Pipe Burst Option – Better Life Cycle Cost
  - For the Last 10 Years
    - Pipe Bursting When Possible
    - CIPP When Necessary (If Feasible)
    - Open Cut When Necessary

Review

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