

# Pipe Rehabilitation Buffett

Layne R. Otteson, P.E.

AERS, INC

Contact info:

612-867-3179

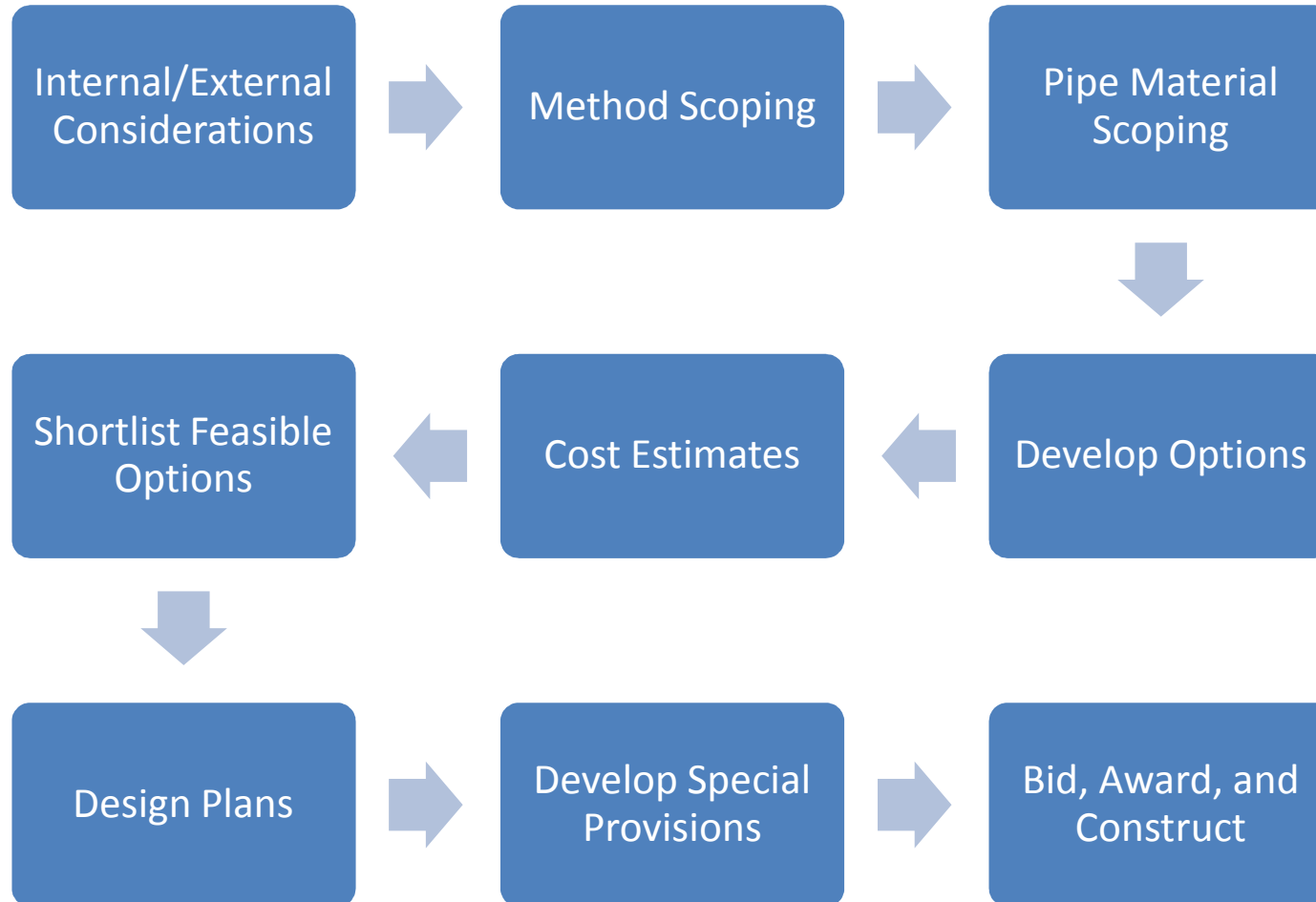
[LayneOtteson@yahoo.com](mailto:LayneOtteson@yahoo.com)

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# A New Approach to Rehabilitation?

- Traditional open cut not always most desirable or cost effective method.
- Alternative methods no longer unusual, specialized or viewed with great risk.
- Tighter budgets and growing needs = creative opportunities.
- It's time to allow various methods to compete against each other for the most cost effective solution.

# “Buffet” Project Progression



# Internal/External Considerations

- Public Works Staff
  - Engineering and Utility Supervisor
- Site Characteristics
  - Subsurface Exploration (soil type and water table)
  - Physical Impacts
    - Utilities, pavement surface, boulevard restoration, trees, ...
  - Traffic Volume
  - Work Space
  - Existing pipe condition (alignment, offset, ...)
- Contractor
  - Available expertise (local, regional, or national)
  - Value engineering opportunities
- Consultant
  - Technical assistance or project designer

# Method Scoping

- Traditional Open Trench Excavation
  - Pipe Bursting
  - Horizontal Directional Drilling
  - Lining
  - Other?
- 
- Designer should identify which methods are applicable for the specific project

# Pipe Material Scoping

- Public Works Staff
  - Engineering and Utility Supervisor
- Future Connections
  - Ability to sleeve pipe for future repairs/connections
  - Ability to connect future service laterals
- Readily available (pipe suppliers)
- Installation expertise (contractors)
- Consultants are an excellent resource

# Pipe Material Options

- Ductile Iron Pipe
  - Slip joint or welded
- HDPE DIPS
  - Electrofused
- PVC or FPVC
  - Slip joint or electrofused
- Designer should determine which materials shall be the City standard.

# Develop Feasible Options

- Eliminate methods or materials not compatible with the project or City standard
- **Develop matrix** with acceptable methods and materials
- Short list options based on Method, Material & Cost Estimate
- Include options into plans and specifications.



|                      |       | <b>Method</b> |               |                      |        |
|----------------------|-------|---------------|---------------|----------------------|--------|
| <b>Pipe Material</b> |       | Open<br>Cut   | Pipe<br>Burst | Directional<br>Drill | Lining |
|                      | DIP   | x             | x             | x                    |        |
|                      | PVC   | x             |               |                      |        |
|                      | FPVC  |               | x             | x                    |        |
|                      | HDPE  | x             | x             | x                    |        |
|                      | Liner |               |               |                      | x      |
|                      | Other | x             |               |                      | x      |
|                      |       |               |               |                      |        |

# Construction Plans

- Standard Detail Sheets
  - Very specific for each method and pipe material
- Plan and Profile Sheets
  - Subset plans for each method/material option
- Traffic Control
  - Recognize safety and work area needs

# Project Manual

- Specifications
  - Consider flexible and rigid specs
  - Address each specific option (method and material)
- Bid Proposal
  - Clearly define the bidding requirements
  - Contractor **must** identify and provide cost of selected option (method and material) in bid submittal
- Advertise, bid and award

# Example - 2009 Water Main Rehab

- 2,600' of existing 6" c.i.p under frontage road adjacent to University Ave (TH 47)
- 11 commercial business west side of road.
  - Perkins, US Post Office, Car Wash, Gas Station, etc.
- Water table at about 3-5' – requires dewatering and silty sand subgrade
- Many breaks so need to rehab pipe
- Minimize impacts to commercial businesses and water fund.

# Method Considerations

## Option A - Open Trench

- Street closure for 6 weeks
- Major disruption to commercial properties
- Replace west curblineline and recon ½ of street
- Boulevard and driveway impacts
- Extended dewatering and temporary water service
- Cost estimated at \$420,000

# Method Considerations

## Option B – Pipe Burst

- Street remain open
- Follow existing alignment
- Temporary water system
- Water table and soils likely not a problem
- Cost estimated at \$310,000

# Method Considerations

## Option C – Horizontal Directional Drilling

- Street remain open
- Risk with high water table and soil type
- Water left in service until switched to new line
- Requires dewatering for pits
- Cost estimated at \$305,000

# Allow Best Options

- Determined that pipe bursting or HDD were the most feasible options.
- Plans and specs provide for:
  - Option B or C
  - Unique plan sheets for each option
  - Requirements for methods and pipe materials.
- Allow the contractor the choice of selecting one of 3 pipe materials with either method.



# Results

- Low bidder was \$235,000 - very competitive bids
- Selected HDD and used HDPE DIPS
- Low bid beat Engineer's Estimate by about 20% and nearly half of the cost of open cut.
- Businesses were very happy.
- Traditional excavators weren't happy.
- Success led to more "buffet" projects.

Questions?