City of Rose Hill

ROSE HILL
Sanitary Sewer Evaluation

FEBRUARY 2017

PEC
PROFESSIONAL ENGINEERING CONSULTANTS

Importance of Sewer Evaluation

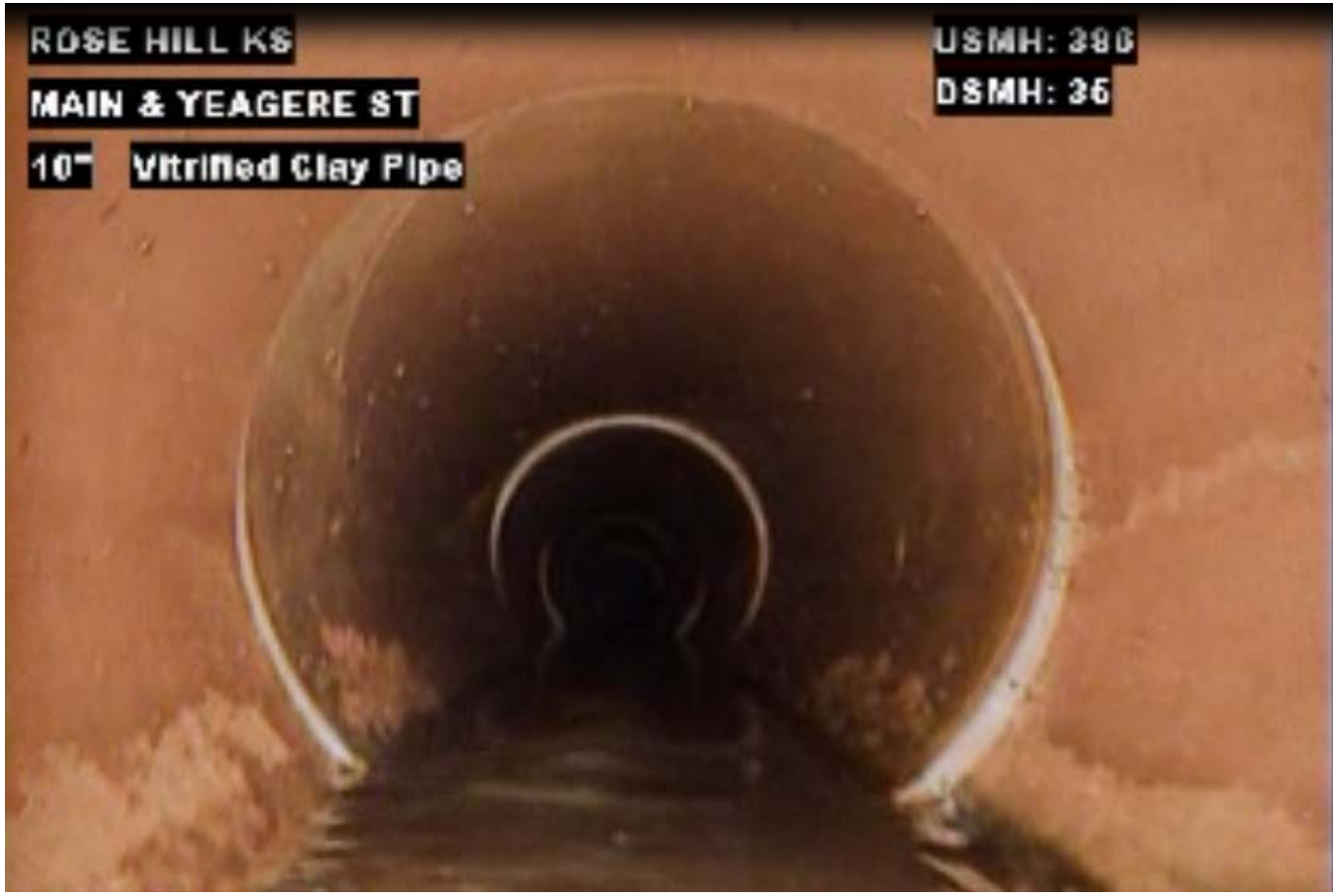
- Older sewer lines tend to develop deficiencies
- Sewer line deficiencies can cause:
  - Decreased sewer capacity
  - Leakage of sewage into environment
  - Increased infiltration and inflow
  - Higher treatment costs
  - Sewer back-up into homes/businesses
- Evaluation provides database of existing conditions and develops plan for improvements

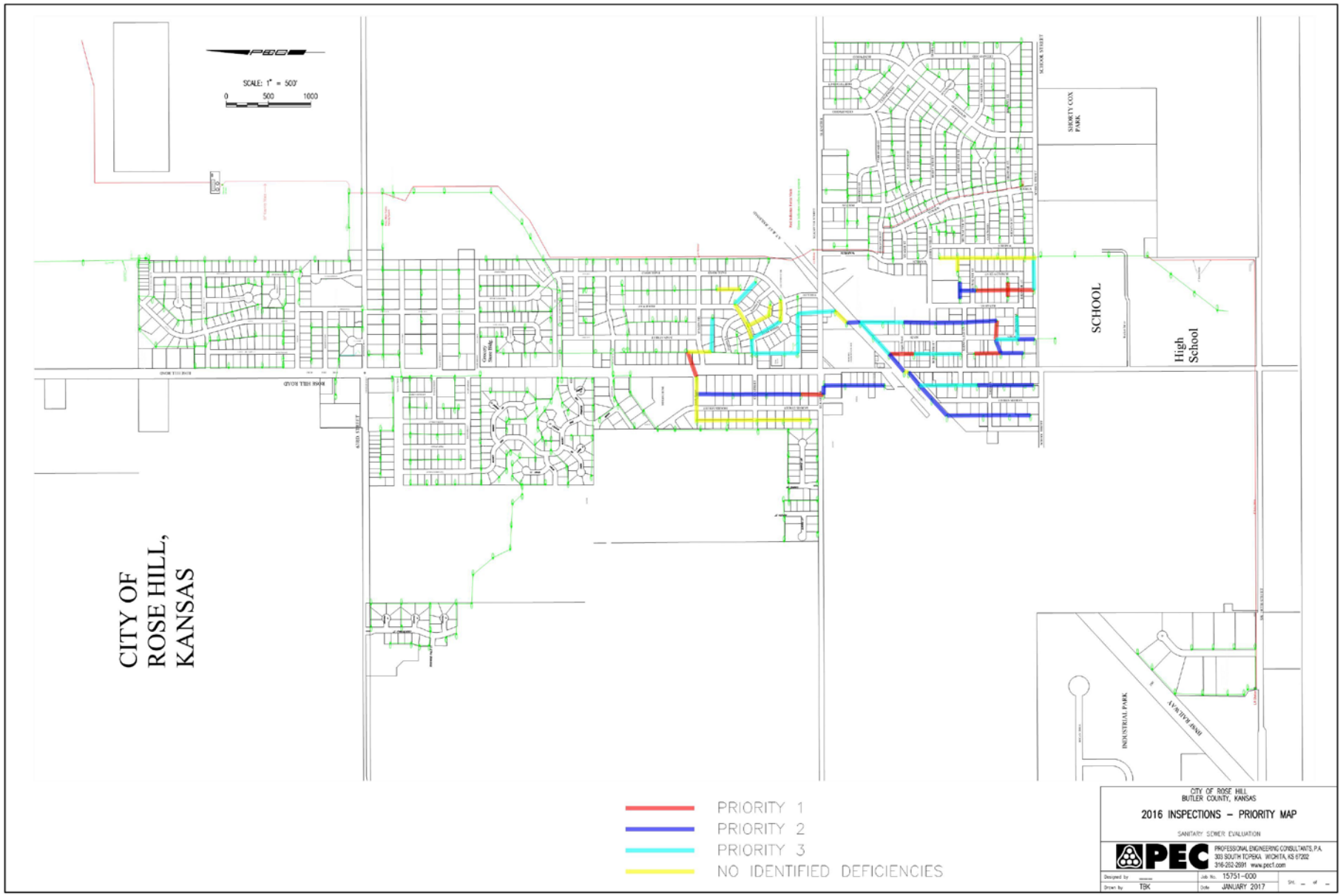
Project Scope

- City to conduct sewer line inspections
- Review/Evaluate sewer inspection tapes and logs
- Review rehabilitation methods and provide recommendations
- Prioritize necessary improvements
- Prepare map of proposed improvements
- Develop cost estimates

Inspection Process

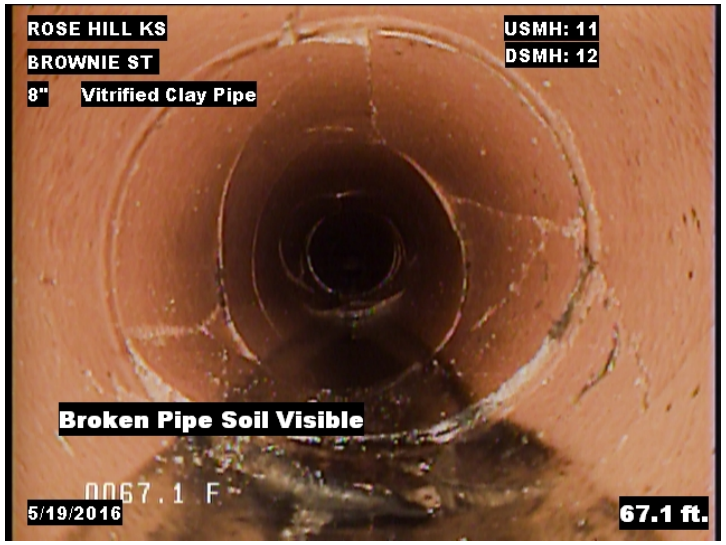
- City contracted with Mayer Specialty Services for inspection
- 73 sewer lines included
- Concentrated on known areas of older lines
- Majority of lines are vitrified clay

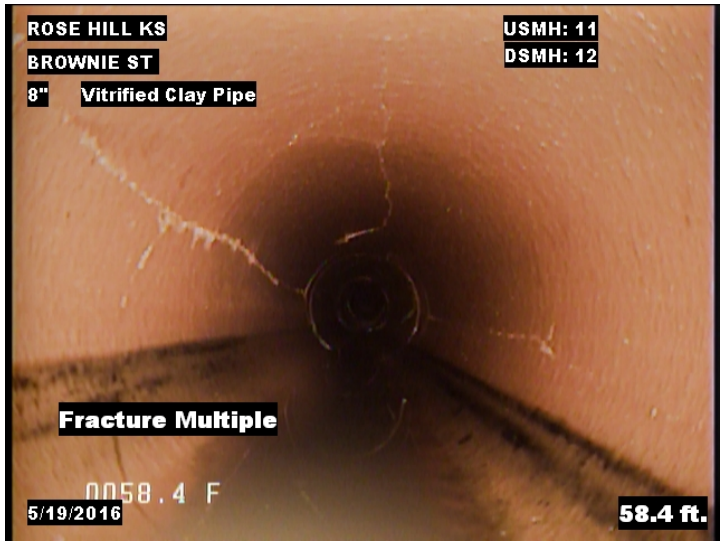



SCALE: 1" = 500'
0 500 1000
CITY OF
ROSE HILL,
KANSAS
SCHOOL
High
School
SHORTY COX
PARK
INDUSTRIAL PARK
PRIORITY 1
PRIORITY 2
PRIORITY 3
NO IDENTIFIED DEFICIENCIES
CITY OF ROSE HILL
BUTLER COUNTY, KANSAS
2016 INSPECTIONS – PRIORITY MAP
SANITARY SEWER EVALUATION
PROFESSIONAL ENGINEERING CONSULTANTS, P.A.
303 SOUTH TOPEKA WICHITA, KS 67202
316-262-2691 www.pec1.com
Designed by
Drawn by TBK
Job No. 15751-000
Date JANUARY 2017

Possible Deficiencies

- Broken Pipe/Hole Void
- Collapsed Pipe
- Fractures
- Root Intrusion
- Intruding Tap
- Sag
- Offset Joints





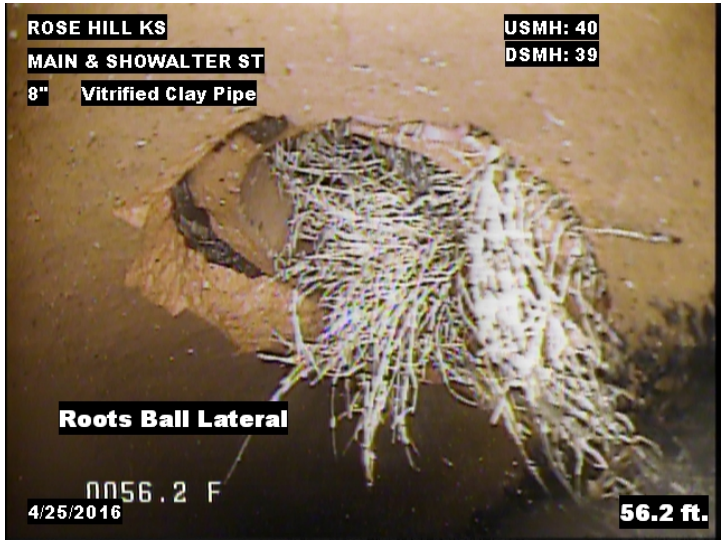


Table of Pipe Deficiencies

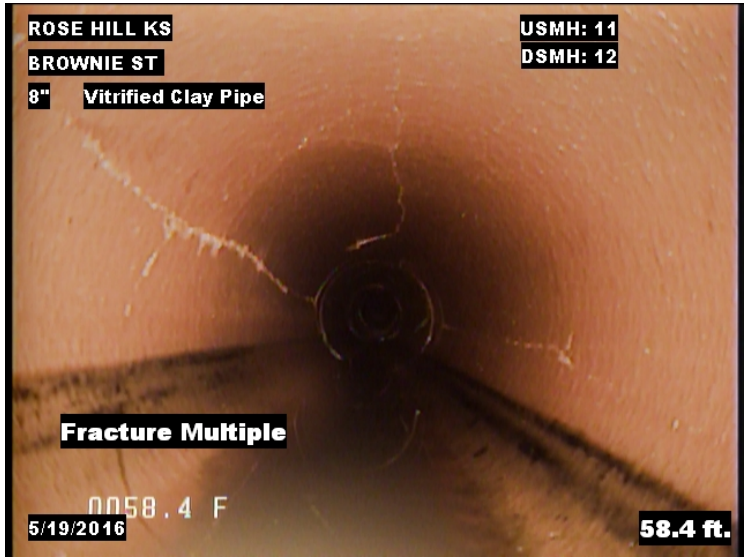
Line Information					Condition Information									Recommended Repairs	
Upstream MH	Downstream MH	Length (ft.)	Size (In.)	Material	Broken Pipe/Hole Void	Collapsed Pipe	Fracture-Multiple	Fracture-Circumferential	Fracture-Spiral	Roots Intrusion	Intruding Tap	Sag	Offset Joints	Point Repair(s)	Lining
8	10	92	8	Polyvinyl Chloride											
9	8	361	8	Cast Iron									x	x	
11	12	93	8	Vitrified Clay	x		x			x					x
12	9	330	8	Vitrified Clay	x		x							x	
13	12	85	8	Vitrified Clay	x	x	x			x			x	x	x
14	12	378	8	Vitrified Clay	x		x			x			x	x	x
24	25	266	10	Vitrified Clay											
30	27	539	12	Vitrified Clay			x							x	
32	30	272	12	Vitrified Clay	x									x	
34	32	447	12	Vitrified Clay			x							x	
35	34	132	12	Vitrified Clay											
36	386	222	8	Vitrified Clay			x							x	
37	36	259	8	Vitrified Clay			x							x	
38	37	374	8	Vitrified Clay	x		x	x		x	x			x	
39	38	409	8	Vitrified Clay	x		x	x		x					x
40	39	345	8	Vitrified Clay			x	x		x	x				x
41	40	205	8	Vitrified Clay	x		x						x	x	
42	41	222	8	Vitrified Clay	x		x			x				x	
43	42	261	8	Vitrified Clay				x		x			x	x	
44	42	467	8	Vitrified Clay	x		x			x	x				x
46	47	232*	8	Vitrified Clay			x				x		x	x	x
47	41	175	8	Vitrified Clay	x		x	x		x					x
48	47	306	8	Vitrified Clay			x			x			x	x	x
49	50	274	8	Vitrified Clay	x		x		x					x	
50	51	273	8	Vitrified Clay			x			x				x	
51	52	296	8	Vitrified Clay	x		x	x						x	x

Rehabilitation Methods

- Cured-in-Place Liners (CIPP)
  - Trenchless installation of polyester sleeve with resin
  - Recommended for existing pipe in fair condition
- Full Replacement (Pipe Reaming/Bursting)
  - Trenchless installation to break apart existing pipe and pull new pipe
  - Usually used when upsizing pipe
- Full Replacement (Open-Cut)
  - Cost greatly effected by surface conditions
- Point Repairs
  - Replacement of short section of pipe via open-cut
  - Cost greatly effected by surface conditions

Recommended Improvements

- Per Sewer Master Plan – no required upsizing
- “Critical” Point Repair – will not allow for CIPP
- “Minor” Point Repair – can alternatively be addressed with CIPP
- Recommended repair determined by weighing cost of alternatives

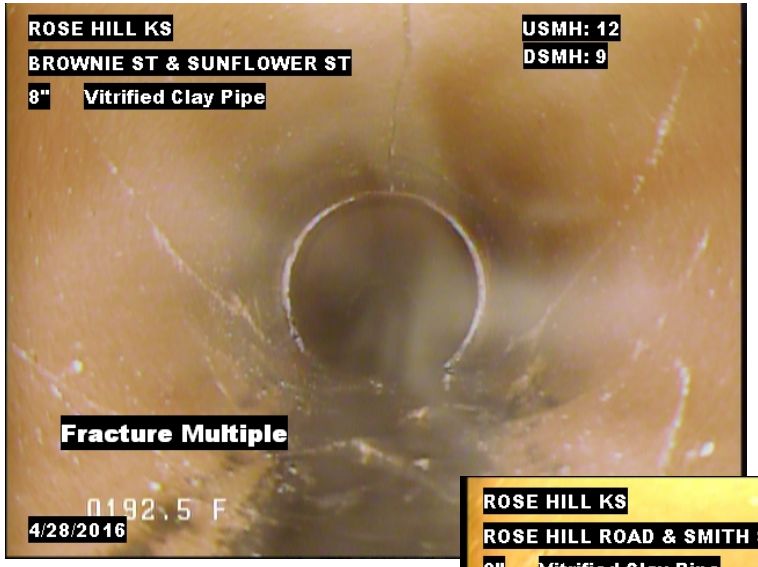


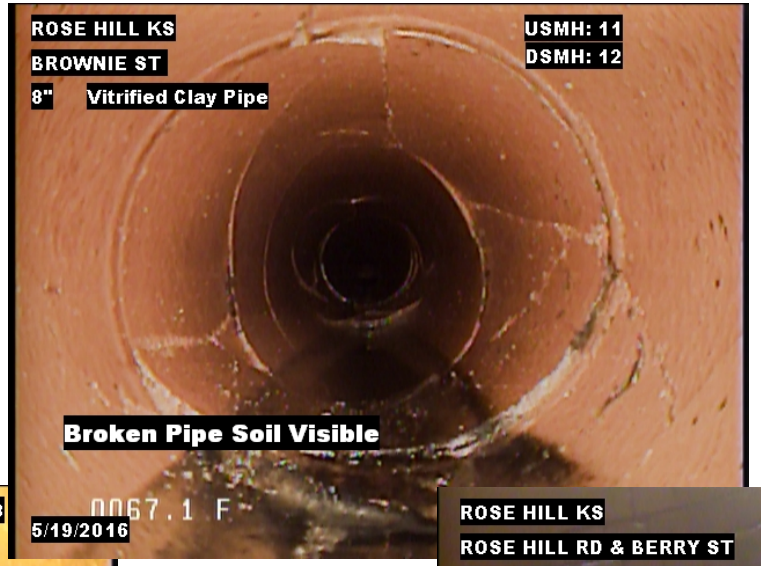
- Example: This location of fractured pipe is classified as a “minor” point repair. The deficiency can be addressed with any of the four methods of rehabilitation. However, taking into account the remaining condition of the full length of pipe, the most cost effective option is recommended.

Prioritization of Recommended Improvements

- First prioritized by overall condition of pipe
- Priority 1 – Most severely damaged sewer lines
- Priority 2 – All remaining lines with “critical” point repairs or lining
- Priority 3 – All remaining lines with “minor” point repairs
- Further evaluated based on function and location in the overall system

Priority 1 Examples





Priority Map

PRIORITY 1
PRIORITY 2
PRIORITY 3
NO IDENTIFIED DEFICIENCIES

Recommended Timeframe

- Priority 1 Improvements: Immediately or as soon as budget will allow
- Priority 2 Improvements: 1-3 years
- Priority 3 Improvements: 5-10 years or re-evaluate in 7-8 years
- Inspections on additional sewer lines over the next few years

Cost Estimates

- Developed for each separate sewer line
- Typical costs based on repair type
- Included $5,000 for each manhole for rehabilitation

Estimated Cost of Recommended Repairs	
Priority Level	Total Cost
Priority 1 Projects	$213,520
Priority 2 Projects	$499,330
Priority 3 Projects	$220,900

Questions?

THANK YOU!

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