

The background image shows a construction site for a CIPP installation. A worker in a bright yellow safety suit is kneeling on the asphalt, handling a long, orange, flexible pipe. A blue cable is coiled on the ground. In the background, other workers are visible near a truck and a ladder. Orange traffic cones are placed around the work area.

ASTM Showdown: How Shakopee, Minnesota Not Only Protected Their Street Pavement Using ‘BLINDSHOT’ Structural Cured-in-Place Pipe Lining (CIPP) Method In Privately Owned Sanitary Sewer Laterals, But Also Challenged ASTM 1216 and 2561

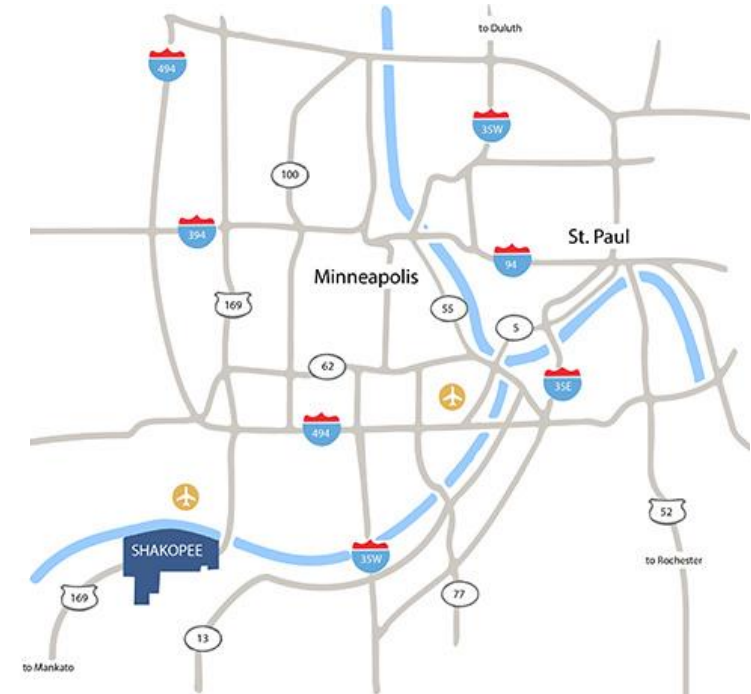
CONGRESS INFRA 2016

SESSION F3

NOVEMBER 23, 2016

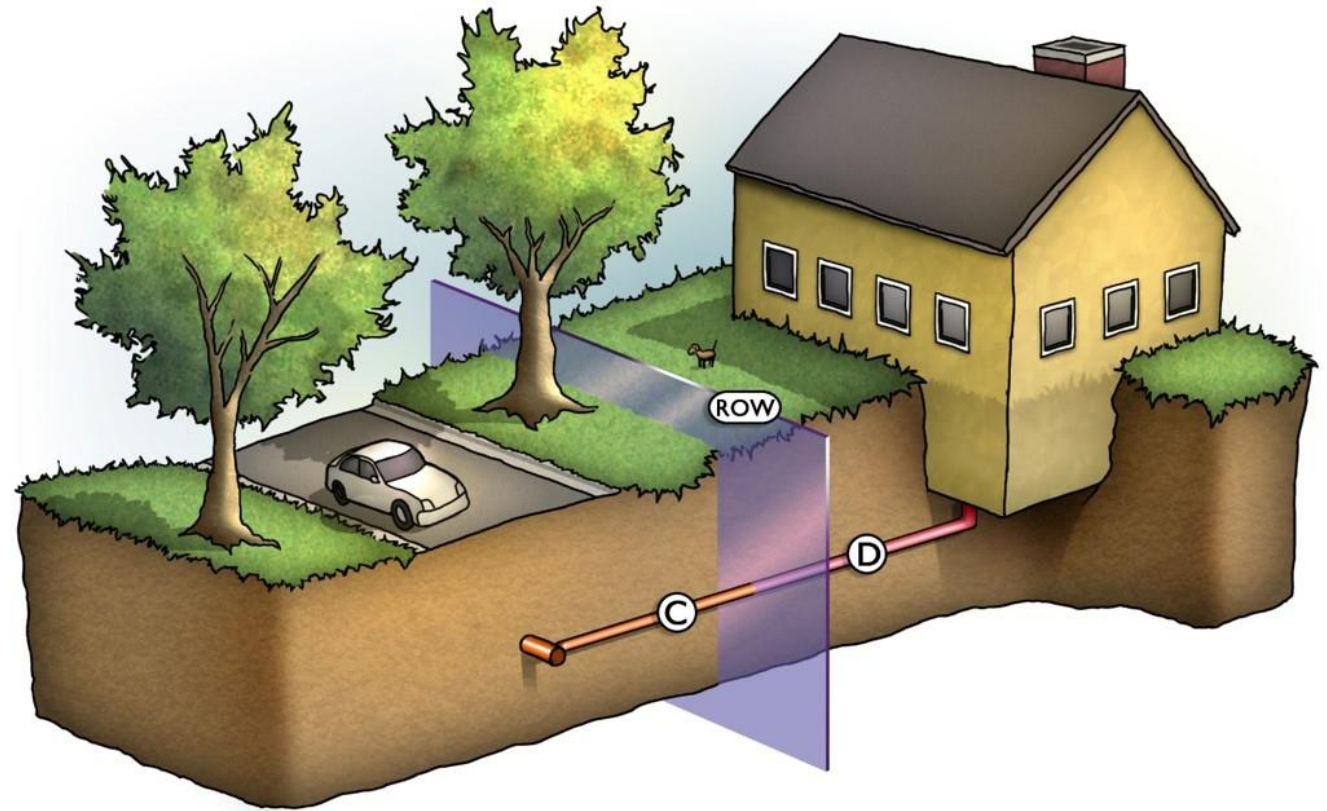


WHERE IS SHAKOPEE?



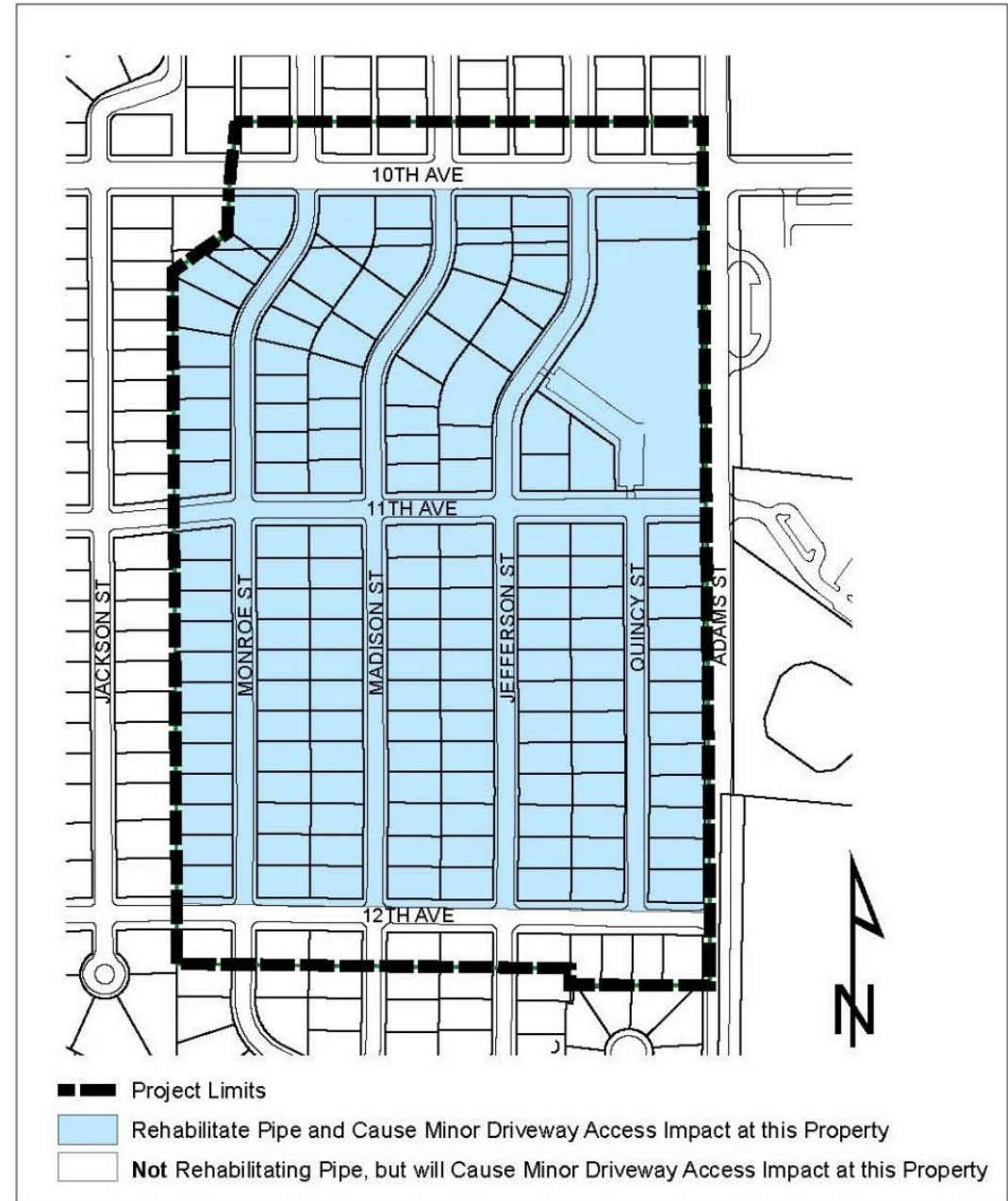
WHY REHABILITATE THE LATERALS?

- Only old pipe remaining within ROW is privately-owned laterals
- Age of Laterals - increasing failure rates - root intrusion
- ~\$12K - \$15K to dig & replace laterals under street
- Protect investment in new street / utilities, adjacent boulevard, existing boulevard trees



MULTI-YEAR PHASES PROJECT APPROACH

- Rehabilitate about 125 laterals per year
- 2015 Project Area - 144 laterals
- 2016 Project Area – 116 laterals
- 75% 6" clay pipe
- 25% 4" cast iron pipe



PUBLIC MONEY TO PAY FOR THE REHABILITATION OF PRIVATE PROPERTY

- Protect prior investment in street & utilities
- Protect trees and boulevards
- Property owner can option out - submit their request in writing



'BLINDSHOT' CIPP METHOD

- Clean, inspect, install liner from wye H to point G w/o cleanout
- G is 5 feet beyond the back of curb
- Future repair made w/o damaging pavement and utilities



MULTI-MEDIA PROPERTY OWNER PROJECT EDUCATION CAMPAIGN

- March 24 Informational Public Meeting
- Meeting recorded by CCTV
- Used Project Webpage
- Used City eNotification
- Local plumbers answer questions about future private rehabilitation work



Oct. 12 Lateral Pipe Rehabilitation Program Update
City of Shakopee
to:
ppasko
10/12/2015 04:26 PM
Hide Details
From: "City of Shakopee" <communications@shakopeemn.gov>
To: ppasko@sehinc.com,
Please respond to communications@shakopeemn.gov

Lateral Pipe Project 10-12

Date: 10/12/2015 4:24 PM

Here's an update on the 2015 Lateral Pipe Rehabilitation Program:

Contractor crews continue to clean, televise and rehabilitate sanitary sewer lateral pipes within the project area, working their way from east to west. The project is about 50 percent complete and is on track to be completed by Nov. 20. More information about the project is available on the [City website](#).

If you have any questions about the project, please contact the City's program coordinator Rick Thomson at (612) 369-4571 or rthomson@ShakopeeMN.gov.

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2015 SANITARY SEWER LATERAL PIPE REHABILITATION
Update October 9 2015



ATTRACTING HIGHLY SKILLED CONTRACTORS

- Exhaustive research
- Allowing contractors installing liners meeting either ASTM 1216 or ASTM 2561 to challenge each other



ASTM Review

- 1216 - reconstruction of pipelines and conduits by inversion - no specified method of accessing the pipelines to be rehabilitated or how to deal with the terminus of the lining - “When cured, the finished pipe will be continuous and tight fitting.”

ASTM Review - Continued

- 2561 - reconstruction of lateral pipe by inversion - lateral pipe is “accessed remotely from the main pipe and from a lateral cleanout.” - “When cured, the main and lateral cured in-place lining shall be a continuous, one piece, tight fitting, corrosion resistant lining”.... “providing a verifiable non-leaking structural connection and seal”. The presence of epoxy bands and pairs of “hydrophilic O-rings” specified at each terminus of the liner

WHAT DID RESEARCH LOOK LIKE? TREE ROOT INTRUSION

PRIMARY MODE OF FAILURE



Building a Better World
for All of Us®

February 23, 2015

RE: City of Shakopee
Sanitary Lateral Rehabilitation Project
Contractor Input into Bidding Documents
SEH No. SHAKO 131119 14:00

Jacob Trapani, Sr.
Vice President
BLD Services, LLC
2424 Tyler Street
Kenner, LA 70062

Dear Mr. Trapani:

During early-spring 2015 the City of Shakopee (City) is considering advertising for bids for a project rehabilitating sanitary sewer service laterals (laterals) beneath street pavement using structural cured-in-place pipe (CIPP) method. To assist in the decision of how to best bid this cured in place lateral lining (CIPLL) project, the City wants to understand some key scoping and costing issues. This letter solicits your input and interest as a CIPLL contractor who might potentially bid this work.

This letter is divided into sections: Project Background, Project Assumptions, Potential Project Scope of Work, and Project Scoping Questions. This letter also regularly refers to the keyed notes on the enclosed illustration.

PROJECT BACKGROUND

1. The City has previously lined sewer main A in the illustration. The sewer main is in/near the center of the paved street.
2. Laterals are about 9 feet below finished grade.
3. Most houses probably do not have existing external cleanouts.
4. While inflow and infiltration (I&I) entering the laterals today is not an issue, the City wants all lateral liners to seal the lateral about 5 feet behind the back of curb (G) and at the sewer main tap connection (H). Sealing these locations of potential leakage will prevent them from becoming a future issue should ground water elevations rise.
5. Some laterals have root intrusion between the house and the sewer main in their laterals.
6. The City anticipates the rehabilitation of approximately 100 laterals per year from the sewer main to about 5 feet behind the back of curb.

PROJECT ASSUMPTIONS

7. All street and driveway pavements must remain open during lateral rehabilitation.
8. Closed circuit television (CCTV) inspections of the sewer main A revealed that laterals are generally 6-inch diameter at the tap, are generally factory Tee and Wye connections but do occasionally have break-in connections of various degrees of tightness/protrusion/recession. Most taps are located at the 3 and 9 o'clock positions. The existing CCTV inspections generally reveal only the first few feet of the lateral out from the main. Some laterals might be 4". When a lateral enters the main as a 6" pipe,

City of Shakopee
Sanitary Lateral Rehabilitation Project
Contractor Input into Bidding Documents



Contractor Responses to Letter 02 23 15

3/6/2015

Revised: 03/11/2015

P:\PT\S\Shako\131119\1-gen\14-corresp\Contractor Responses to 02 23 15
Letter\Contractor_Contacts_for_Potential_Bidders.xlsxResponses

No.	Question	BLD Services, LLC	Musson Brothers, Inc.
22	What CIPLL product will you install?	BLD "Service Connection Seal + Lateral"	LMK
	What resins and tubes do you use for this? Does your CIPP product have long-term flexural creep data available either from a testing lab or past projects?	Vinylester & Polyester Resins along with a polyester needled felt tube. Yes, the BLD product has test data available	
23	Does your CIPP product fully wrap the inside of the sewer main (A)? If so, for how many inches up and downstream of the lateral connection does your CIPP product extend inside the sewer main?	Yes - 5" on each side of the lateral connection	The T-Liner is a full wrap at the main connection
24	How does your product accommodate in-line changes in diameter?	The BLD Product can make diameter transition changes, as in 6" to 4". These are built after review of pre video of the lateral is complete.	Transitions are sewn into the one piece liner measuring from an upstream cleanout. The transition also eliminates the risk of tearing
25	How do you cure your CIPP product? How does your CIPLL product provide a sealed water tight connection at the tap and at the property line end of the rehabilitated lateral?	Ambient curing system. A hydrophilic sealant is used to enhance the water tight seal at the mainline interface and at the upper terminating point of the lateral.	Steam cure. Hydrophilic o-rings at the upper and lower terminations and or a hydro hat.
26	How far into the lateral from the sewer main (A) can you install your CIPP product using blind shot method?	35' plus, depending on the amount of bends and offsets - we have installed well over 60' in some cases.	10 feet-Very comfortable. 20 feet- comfortable. 30 feet- increases.

Engineers | Architects | Planners | Scientists

Short Elliott Hendrickson Inc., 10901 Red Circle Drive, Suite 300, Minnetonka, MN 55343-9302

SEH is 100% employee-owned | sehinc.com | 952.912.2800 | 800.734.6757 | 952.912.2800 fax

MARCH INFORMATIONAL MEETING

- Lateral Ownership
- \$10-\$15k for repair under street
- City funded Program
- Can option out – submit request in writing
- September – November duration
- Opportunity to Rehabilitate Balance of Pipe

INVITATION

TO: Property Owners in the 2016 Lateral Sanitary Sewer Pipe (Pipe) Rehabilitation Program (Program)
Area - Shown in Figure 1 Below

FROM: The City of Shakopee Engineering Division and its Consultant for this Program, Short Elliott Hendrickson Inc. (SEH)

WHAT: Informational Meeting

WHY: Come learn how during summer 2016 the City will rehabilitate approximately the first 25-feet of your pipe at its **own** expense as part of this program without digging a trench. Rehabilitation work will cause **minor** inconveniences to you. We will discuss these inconveniences too.

WHEN: March 29, 2016 at 6:30 pm

WHERE: City Council Chamber - City Hall
129 Holmes Street South
Shakopee, MN 55379



Figure 1



Figure 1

CHALLENGE OUTCOME – BIDDING 2015

ASTM Spec	Engineer's Estimate	National Water Main Cleaning Co. (NJ)	Quam Construction (MN)	Performance Pipelining (IL)
1216 & 2561	\$890,201			
1216		\$606,316		
2561			\$1,144,749	\$1,365,070

- **Engineer's Estimate - \$6,182 / Lateral**
- National - **\$4,211/ Lateral - 68%** of the Estimate
- Quam - \$7,950 / Lateral - 129% of the Estimate
- Performance – **\$9,480/Lateral 153%** of the Estimate
- Includes mobilization, traffic control, cleanout installation (if needed), cleaning, pre-CIPP closed-circuit television (CCTV) inspection, furnish and installation of CIPP, and post-CIPP CCTV inspection

CHALLENGE OUTCOME – BIDDING 2016

ASTM Spec	Engineer's Estimate	BLD Services (LA)	Performance Pipelining (IL)	National Water Main Cleaning Co. (NJ)	Musson Bros, Inc (WI)	Quam Const. (MN)	United Pipe Renewal, Inc (IA)
1216 & 2561	\$746,275		\$549,640		\$740,840	\$765,176	\$880,652
1216		\$524,980		\$633,475			
2561							

- **Engineer's Estimate - \$6,433 / Lateral**
- BLD - **\$4,526/ Lateral - 70%** of the Estimate
- Performance - \$4,738 / Lateral - 74% of the Estimate
- National – \$5,461/Lateral - 85% of the Estimate
- Musson– \$6,387/Lateral - 99% of the Estimate
- Quam– \$6,596/Lateral - 102% of the Estimate
- United – **\$7,592/Lateral - 118%** of the Estimate
- Includes mobilization, traffic control, cleanout installation (if needed), cleaning, pre-CIPP closed-circuit television (CCTV) inspection, furnish and installation of CIPP, and post-CIPP CCTV inspection

CHALLENGE OUTCOME – FIELD WORK - NATIONAL

- 2015 - Epros DrainMthH Liner & DrainLCR – steam cure
 - Installed about 4 laterals per day
 - 4 cleanouts installed
- 2016 – BLD ‘Service Connection Seal + Lateral – ambient cure
 - Installed about 2-3 laterals per day
 - 8 cleanouts installed
- Clean/Inspect 6-8 laterals per day



CHALLENGE OUTCOME - ISSUES

- 2015
 - 1 o/s joint - cleanout
 - 1 broken pipe wall - cleanout – snagged cleaning head
 - Heavy roots - \$35k change order
 - 2 lost end caps
 - Sags in 4 laterals
 - Infiltration in 2 laterals
 - 1 wrinkled terminus
- 2016
 - 2 90-degree concrete manhole benches
 - 15 resin slugs – about 50% needing excavation – others 'pushed' out
- 2015 & 2016
 - Laterals tangential to centerline of main
 - 90 degree lateral bends within feet of main



CHALLENGE OUTCOME – DRAINLCR PRODUCT

- 1 lateral already rehabilitated with DIP
- Wye compromised
- Rehabilitate only wye
- 2' of wye
- Circumferential wrap
- Ambient cure – used winter product



CHALLENGE OUTCOME – SUCCESS & DURATION

- 2015
 - Rehabilitated 136 of 144 (94%)
 - Completed 9 calendars days before 11/20/15 completion date
- 2016
 - Rehabilitated 104 of 116 laterals (90%)
 - Completed 8 calendar days past 10/28/16 completion date



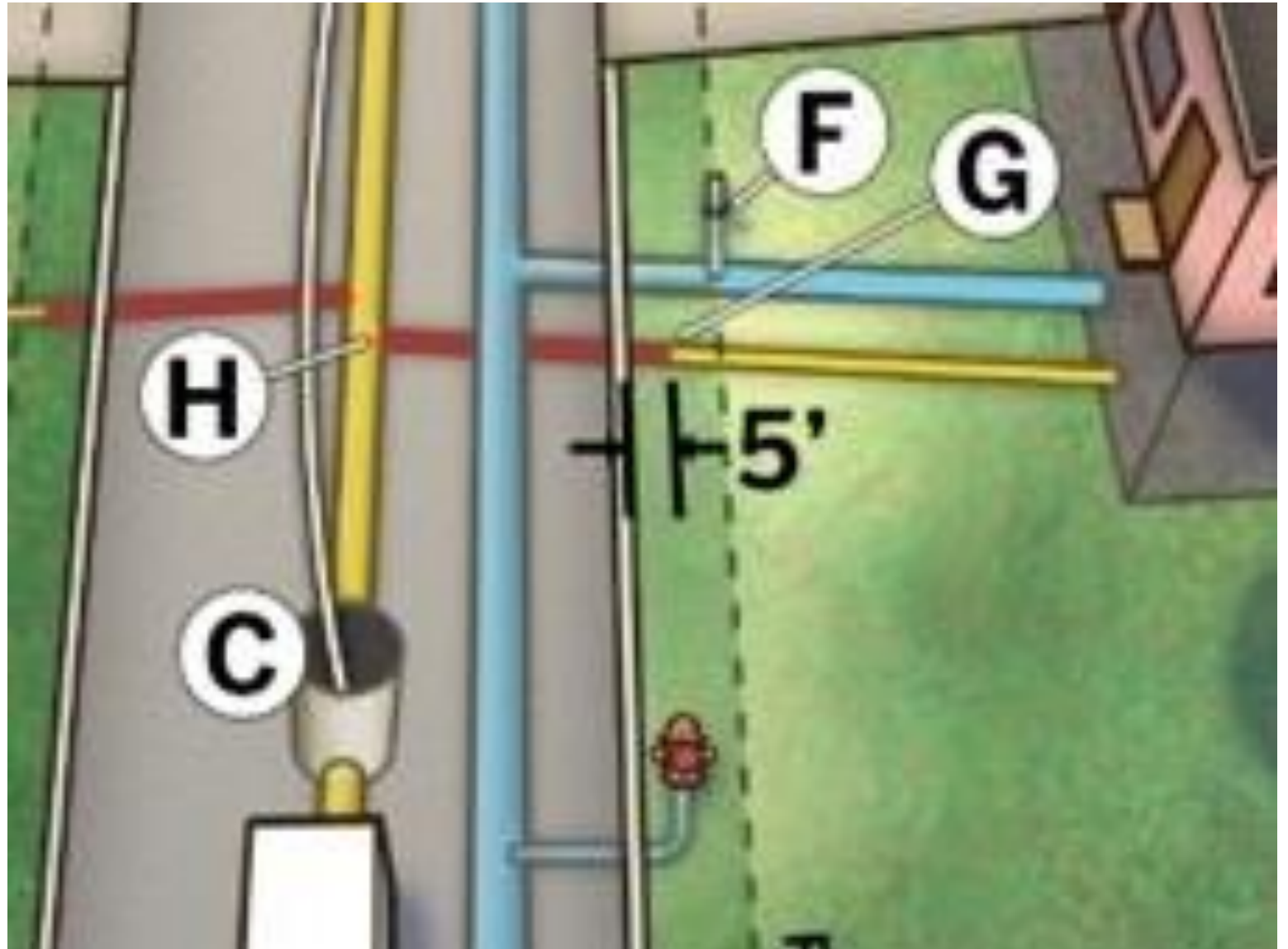
CHALLENGE OUTCOME – ESTIMATED FINAL CONTRACT AMOUNT

- In 2-year long correction period
- 2015
 - Include \$35k change order root removal
 - Estimated \$566,000 final payment – 7% less than contract amount
 - \$4,132 / lateral
- 2016
 - No change orders
 - Will not exceed contract amount - \$524,980
 - \$4,526 / lateral



CHALLENGE OUTCOME – PROPERTY OWNERS REHABILITATING BEYOND POINT G?

- 2015
 - 8 property owners interested
- 2016
 - 2 property owners interested
 - Numbers climb when post-lining CIPP made available?



BEARING OF CHALLENGE ON THE FUTURE?

Shakopee will bid the next phase of their project during early spring 2018

- **2018 project area failure mode is root intrusion**
- **Project will bid earlier to find better bid unit prices**



THANK YOU

• Bruce Loney, PE, Public Works Director, City of Shakopee - BLoney@ci.shakopee.mn.us - 952.233.9361

• Paul J. Pasko III, PE, Short Elliott Hendrickson, Inc. - ppasko@sehinc.com - 952.912.2611