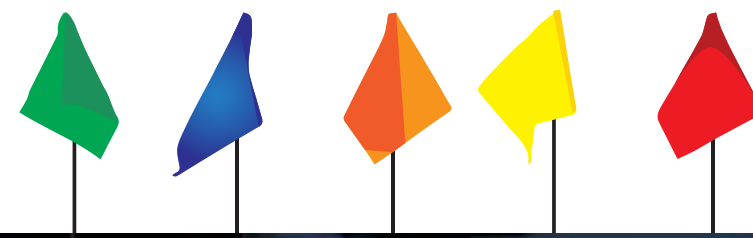


# From Dust to Gold: Pipe Reaming Renaissance in El Dorado, Kansas

Michael A. Salinas, PE.

Diego J. Medrano.

Tuesday, March 4, 2025



**Underground Infrastructure Conference**

Construction. Rehabilitation. Asset Management.

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# OUR AGENDA

- 01. OVERVIEW OF EL DORADO**
- 02. CONSTRUCTION METHOD**
- 03. SPECIAL CASES**
- 04. LESSONS LEARNED**





01

02

03

04

## OVERVIEW OF EL DORADO



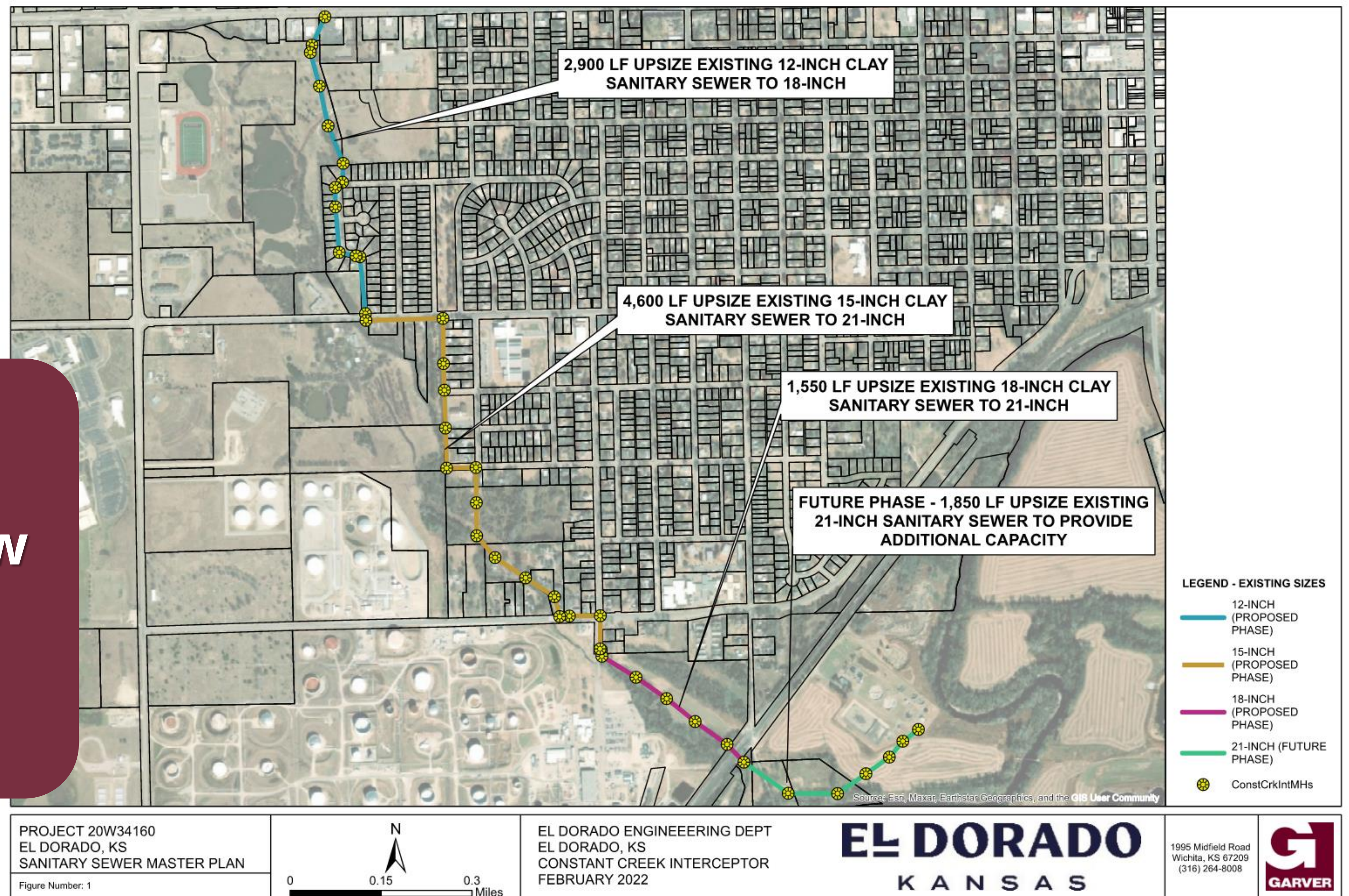
## El Dorado Public Works:

- 129 miles of water mains
- 91 miles of sanitary sewer collection lines
- 1,872 manholes
- 11 lift stations





Improvements  
to Sanitary  
Sewer will allow  
for future  
Industrial  
growth





# Federal funding resulted in environmental studies and USACE coordination

A graphic for the USACE Section 408 program. The background is a blue and green map. At the top left is the USACE logo (a red square with a white castle icon) and the text "US Army Corps of Engineers®". To its right is a yellow star and the text "U.S. ARMY". In the center, the words "SECTION 408" are written in large, bold, white letters. On the right side, there is a vertical blue panel. The top of this panel features a graphic of many hands raised. Below this, the text reads: "The U.S. Army Corps of Engineers (USACE) Section 408 program provides permission for people, towns, or businesses to alter or impact a USACE project, like a dam, levee, or waterway. You can find more information about the Section 408 program at [www.usace.army.mil/Missions/Civil-Works/Section408/](http://www.usace.army.mil/Missions/Civil-Works/Section408/)."





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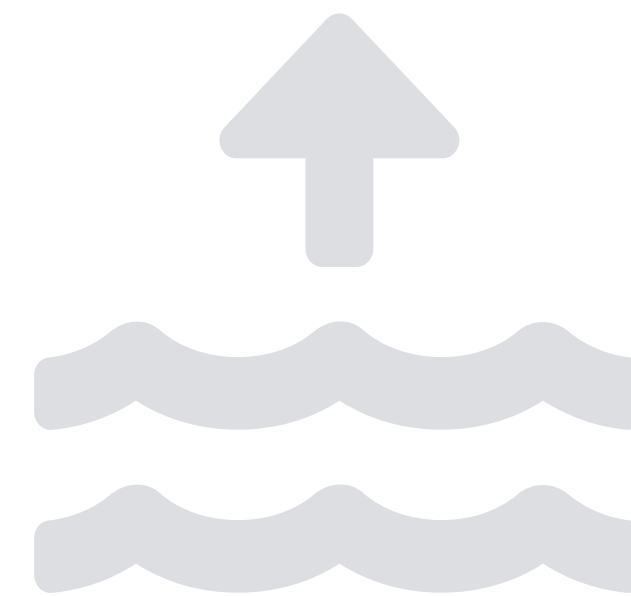
## CONSTRUCTION METHOD



# Multiple benefits from Trenchless Technologies

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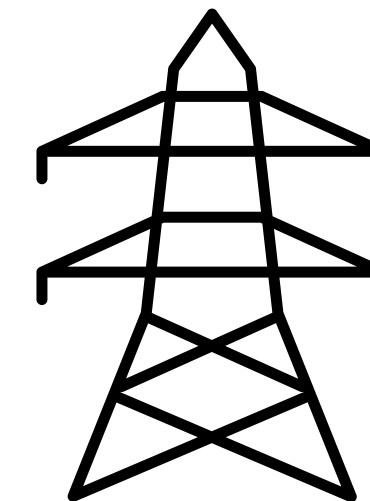
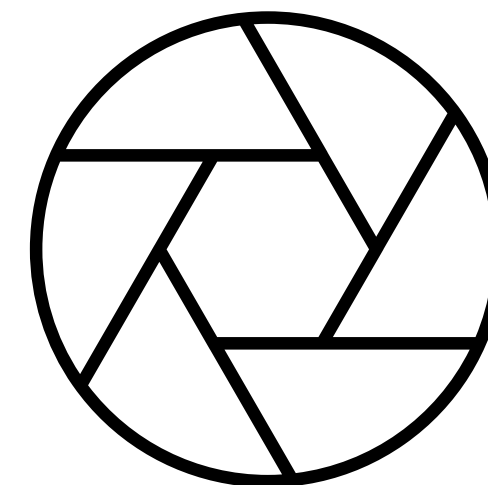
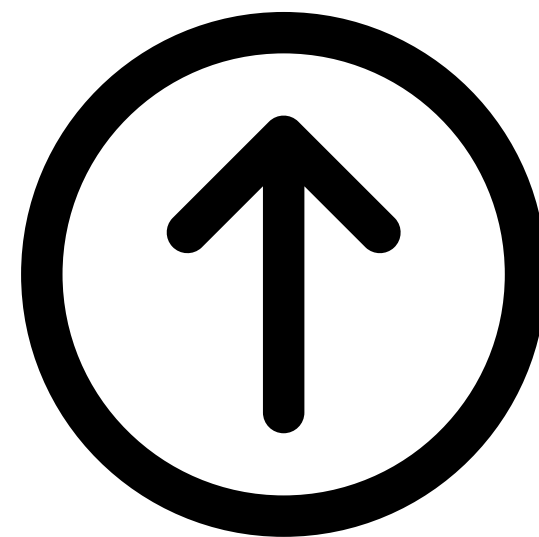
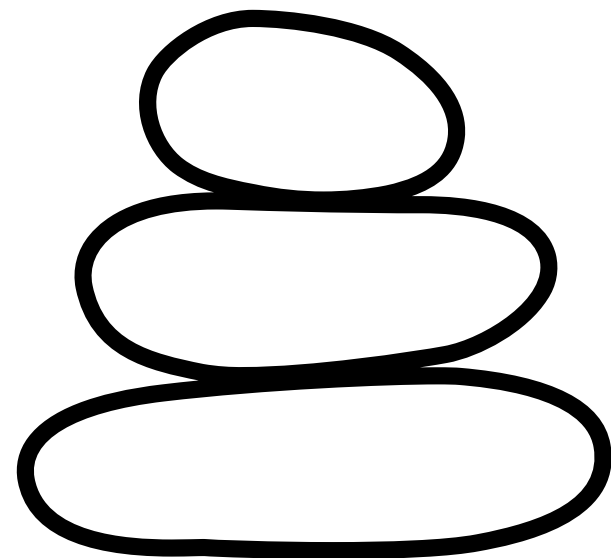
- Less disruption to the public.
- Minimal environmental impacts.
- Soil and groundwater conditions.
- Reduce pavement repairs.





# Pipe Reaming Method Selection

- Sedimentary rock conditions.
- Upsizing of the sanitary line.
- Use of HDPE pipe.
- Clearances grade/utilities.





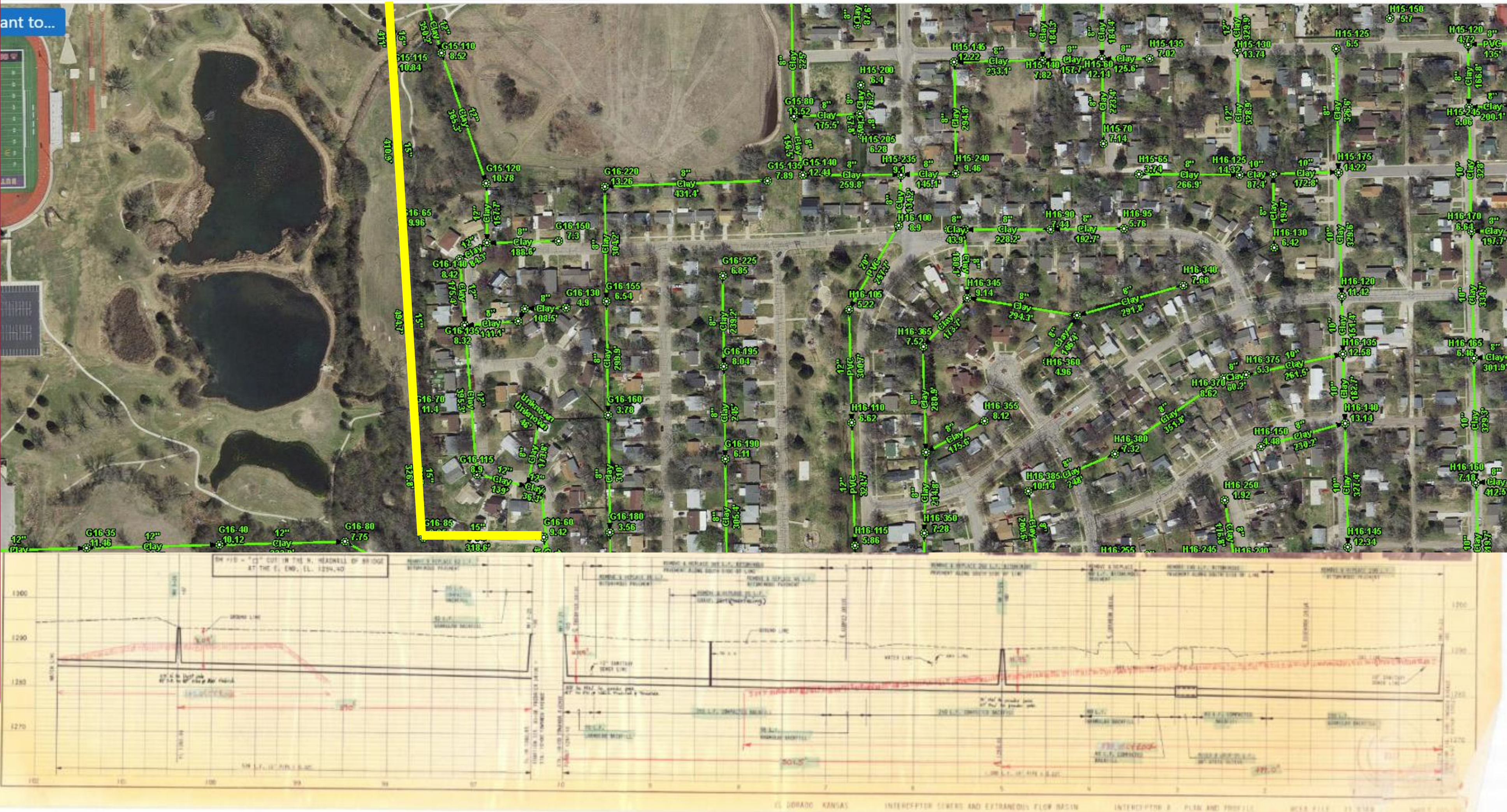
# LOCAL EXPERIENCE AS A MAJOR DRIVER IN METHOD SELECTION

## EL DORADO K A N S A S








- **Establish pit locations.**
- **Location of service lines.**
- **Proximity of other utilities and services.**
- **GIS materials.**





# Geotechnical bore holes confirmed pipe reaming is the optimal option.

- **Hard rock.**
- **Soft rock.**
- **Clay.**
- **Silt.**
- **Sand.**
- **Fine gravel.**
- **Coarse gravel.**
- **Boulders.**

Model Layer	Graphic Log	Location: See Exploration Plan	Depth (Ft.)	Elevation.: 1283 (Ft.)	Water Level Observations	Sample Type	Recovery (In.)	Field Test Results	SAMPLE NUMBER	HP (tsf)	Water Content (%)	Atterberg Limits
		Latitude: 37.8041° Longitude: -96.8687°	0.5	1282.5								LL-PL-PI
1		<b>FILL - LEAN TO FAT CLAY</b> , trace calcareous nodules, dark brown	2.0	1281		X	10	3-3-3 N=6	1	4000 (HP)	25.8	
		<b>LEAN CLAY (CL)</b> , trace calcareous nodules, brown, medium stiff, (possible fill)  - very stiff below 3.5'				X	18	7-8-7 N=15	2	9000+ (HP)	14.3	41-16-21
		- medium stiff below 8.5'				X	18	3-3-3 N=6	3	4000 (HP)	26.7	
			12.5	1270.5								
3		<b>SHALE</b> , trace limestone nodules, gray, slightly weathered				X	1	50/1.5"	4		25.3	
			18.6	1264.4								
		<b>Boring Terminated at 18.6 Feet</b>										
							1	50/1"	5			

[illegible]



## CCTV Inspection:

- Pipe Condition.
- Obstructions to the reamer.





1. Expose existing lateral connections.
2. Disconnect existing service lines.
3. Provide temporary bypassing line.



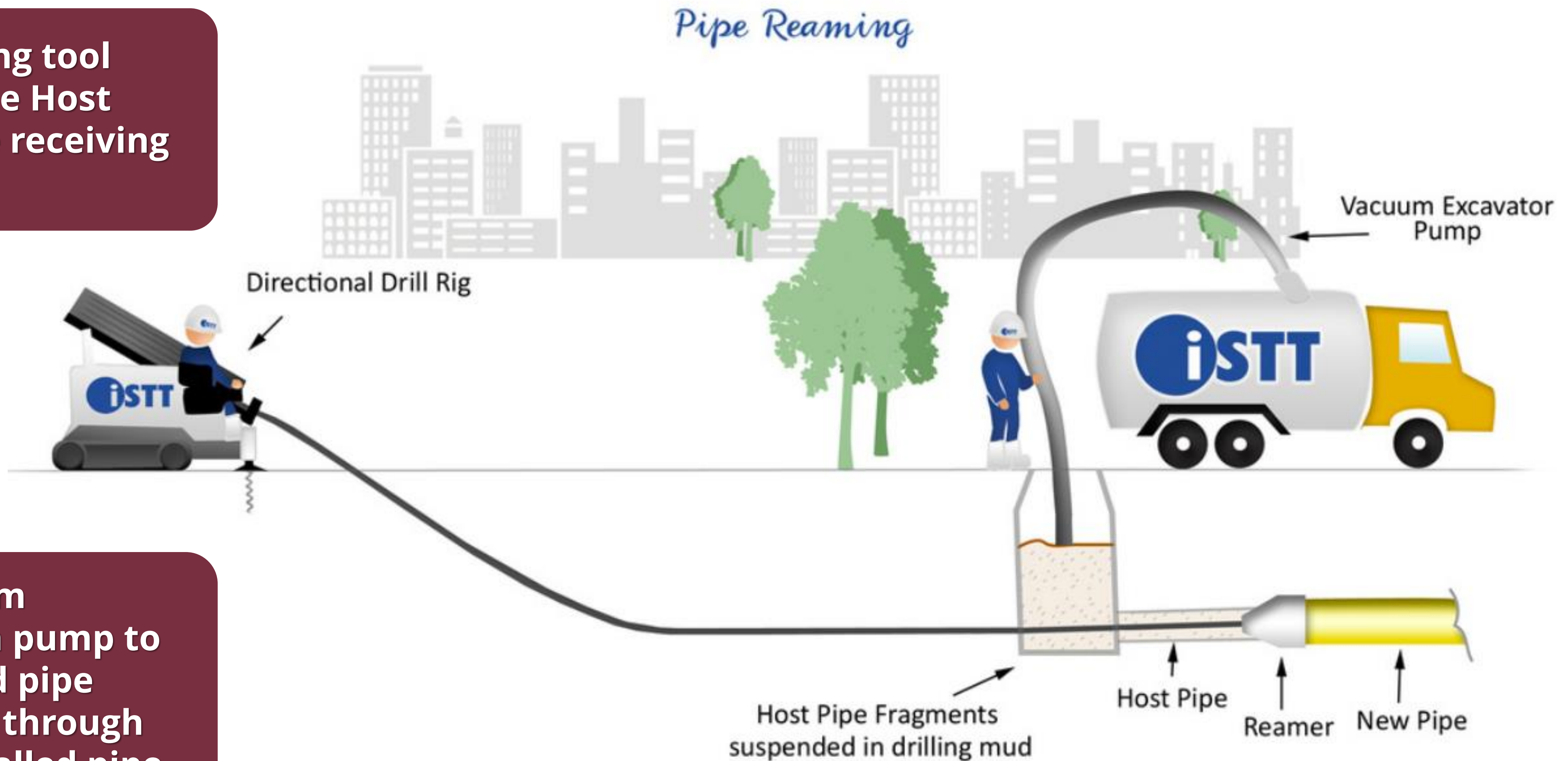


4. Dig sending and receiving pits.
5. Connect reaming tool into New Pipe at the sending pit.





6. Pull reaming tool through the Host Pipe at the receiving pit.



7. Use vacuum excavation pump to remove old pipe fragments through newly installed pipe.





8. Connect laterals to new mainline sewer pipe.

9. Conduct quality control inspections.

10. Backfill pits and complete pavement restoration.





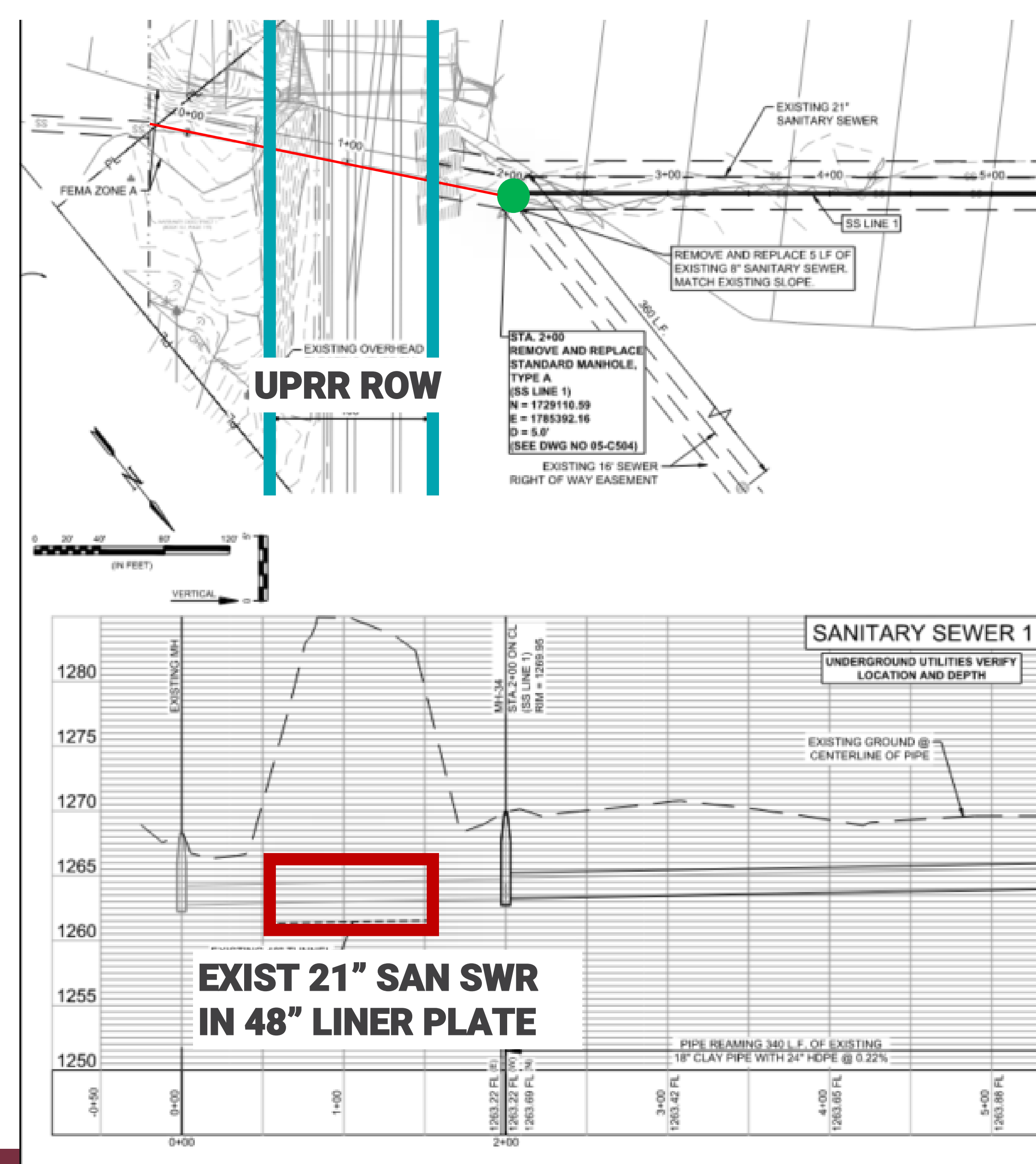


01 02 03 04

## SPECIAL CASES



Existing sanitary sewer line crossed underneath a railroad and several trenchless techniques were vetted to improve collection line



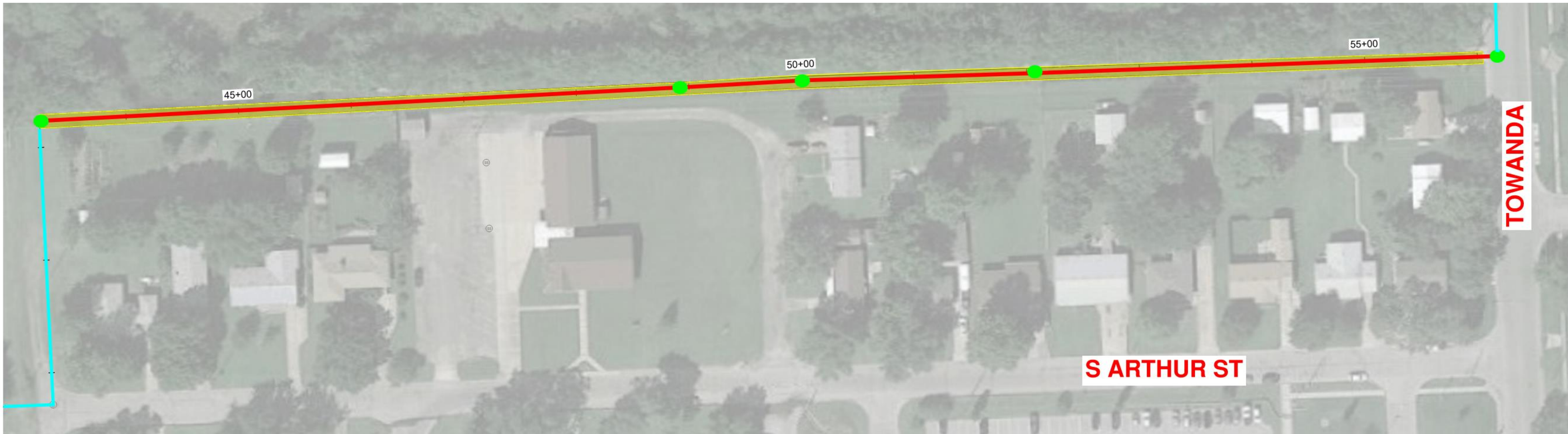


**Existing sanitary sewer line  
is aligned within a concrete  
lined channel and drainage  
is required to be  
maintained**





**The entire drainage channel will be completed in one reaming operation**



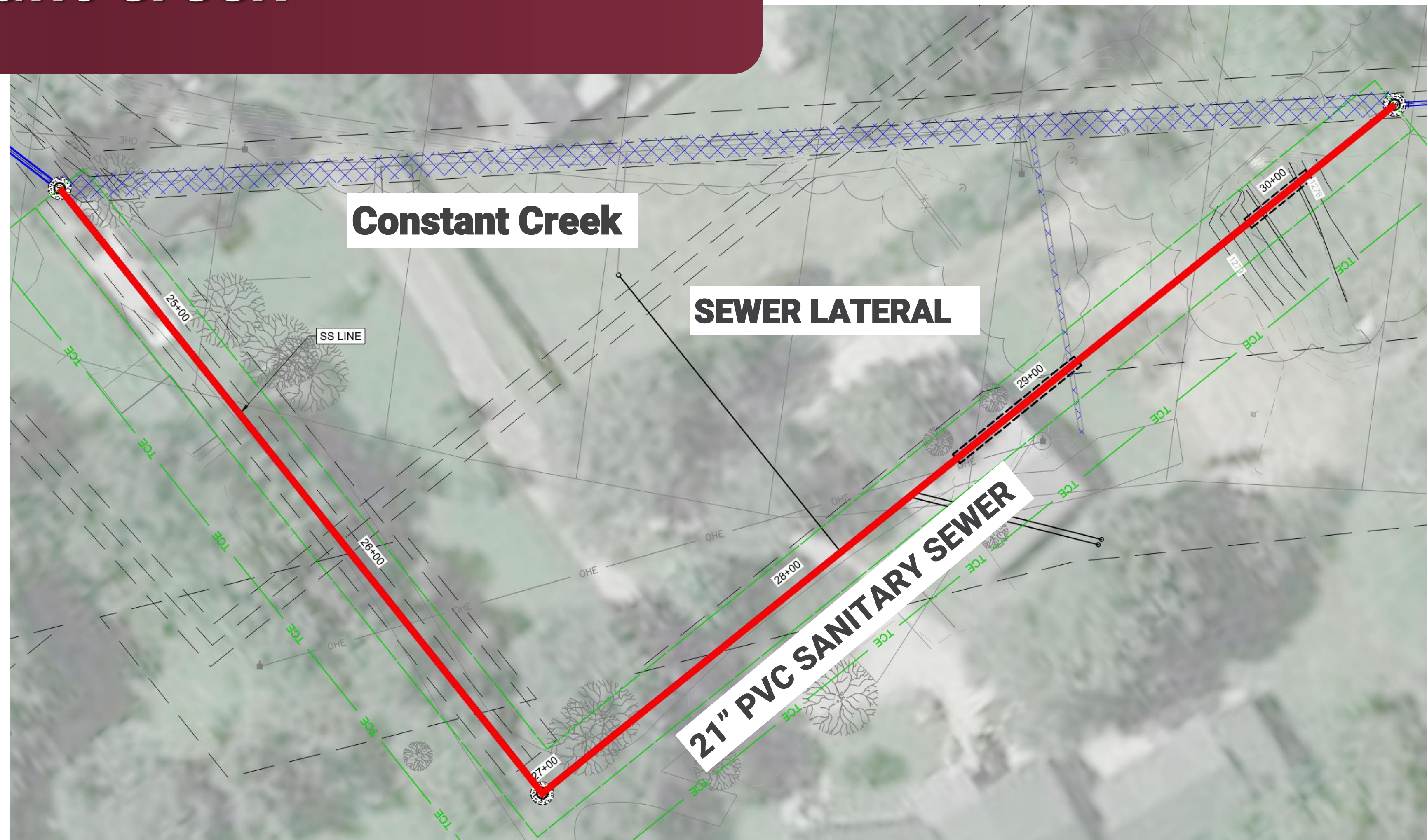


**The sewer is  
encased in  
concrete as it  
crosses a Constant  
Creek which  
limited trenchless  
improvements**



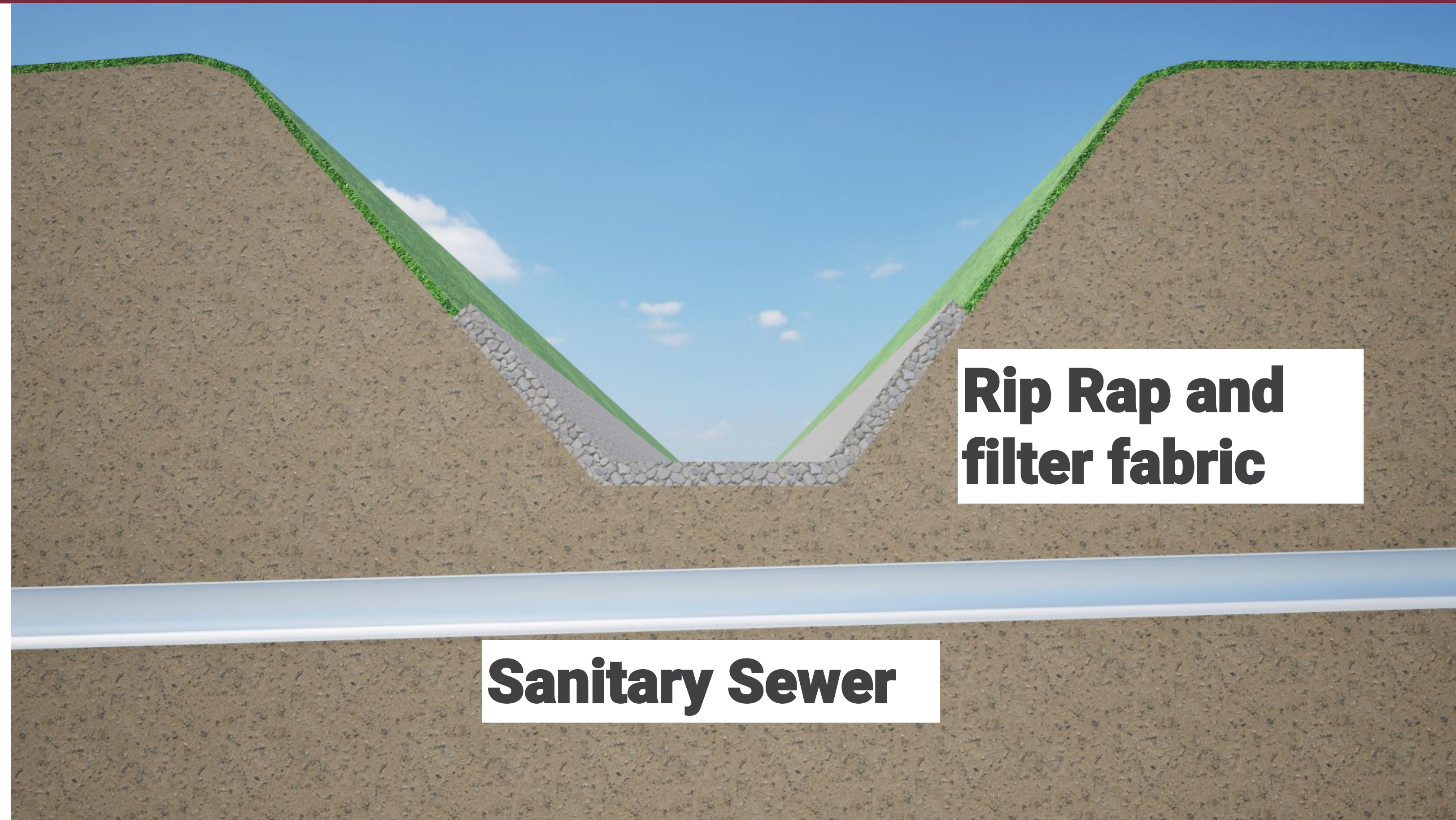


# Realignment was developed to avoid impacting Constant Creek





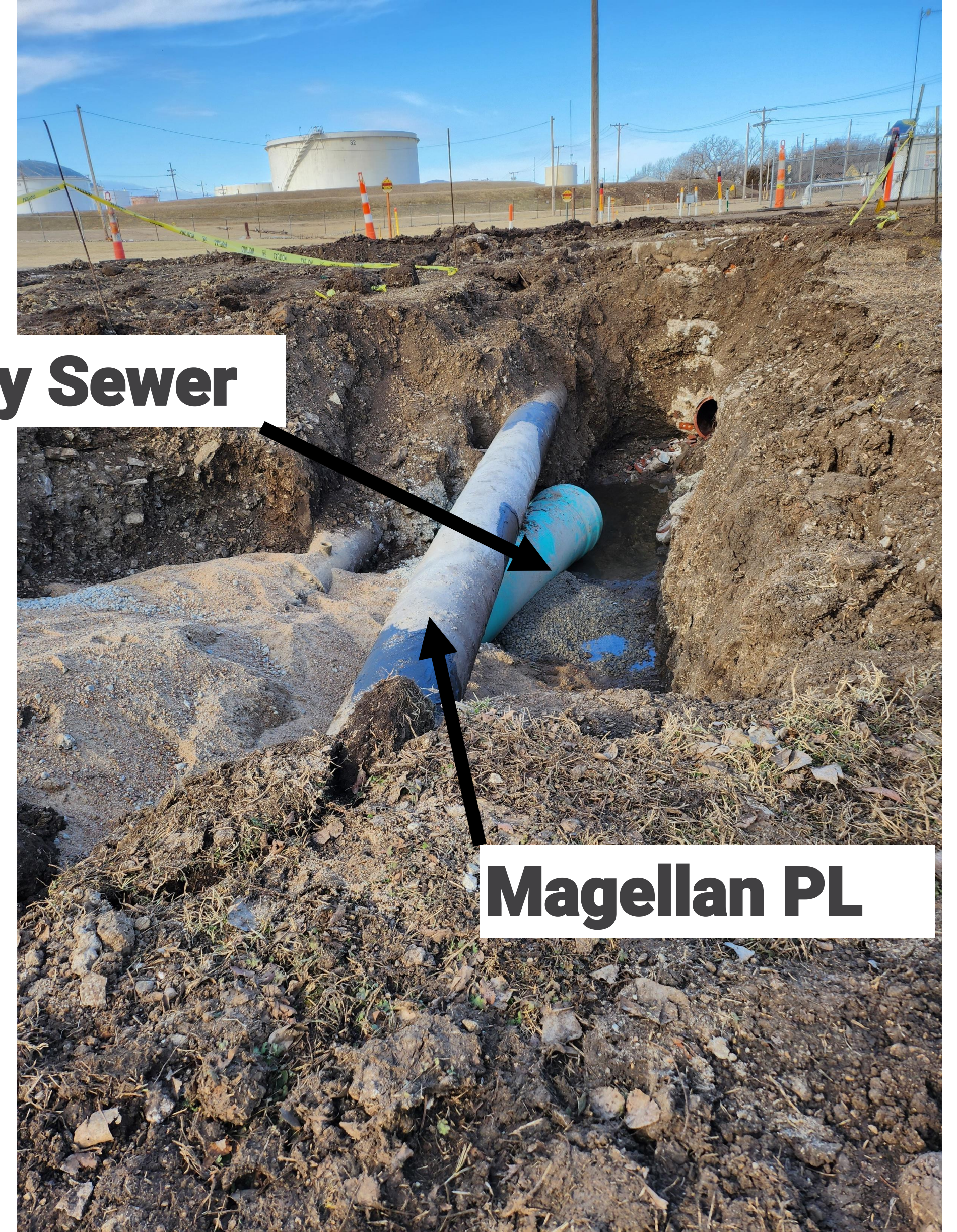
# Additional improvements were implemented at Creek Crossings to meet jurisdictional requirements





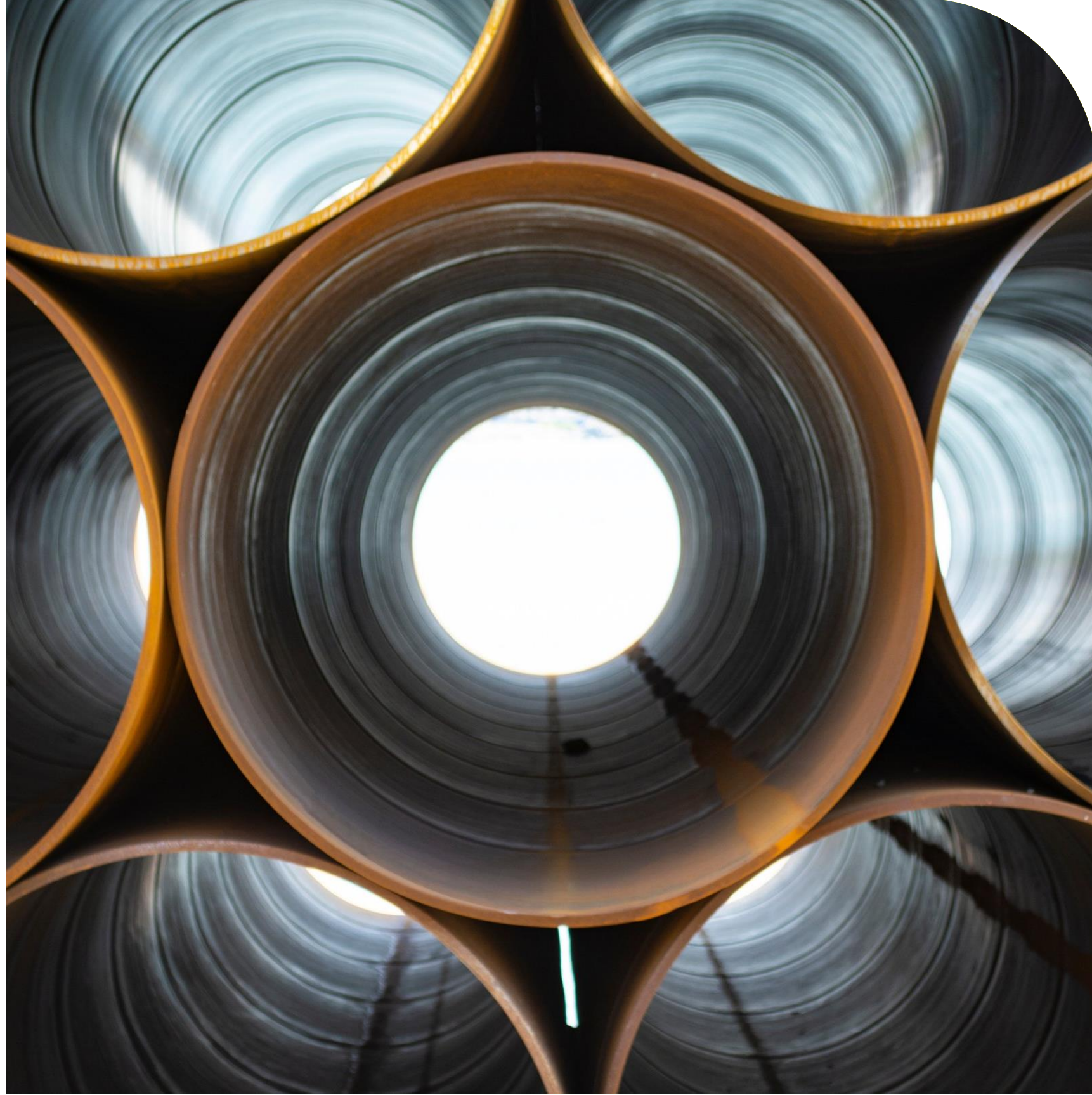
**Magellan crossing  
had limited cover  
and had to be  
exposed during  
construction.**

**Sanitary Sewer**



**Magellan PL**





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## LESSONS LEARNED

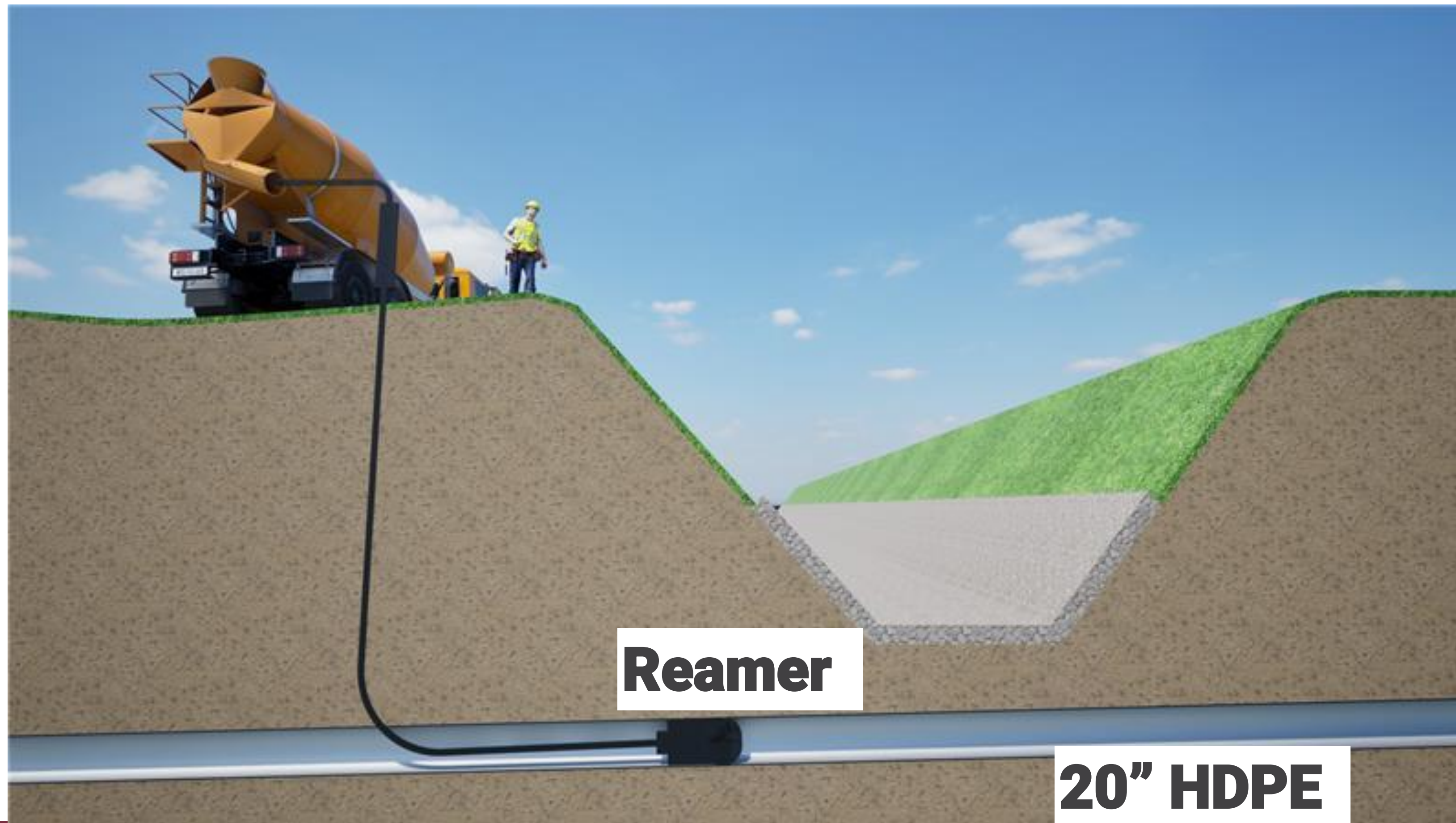


# Pipe reaming is a practical installation method when constructing in sedimentary rock





Pipe reaming is a feasible option where there is limited cover.





**While pipe reaming limits impacts to the surface, the lay down area shall be investigated to determine if there is suffice construction availability.**





**Alternative construction methods shall be considered in bid form to obtain a competitive bid**





Utility coordination is vital in designing pipelines.



**4" Water Line**



# Any Questions?

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