

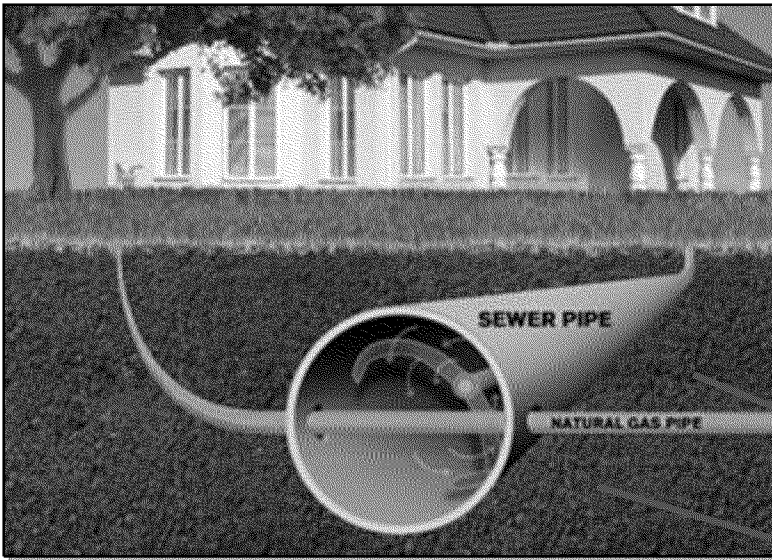
Cross Bores Inspections

Distribution Integrity Management

May, 2014

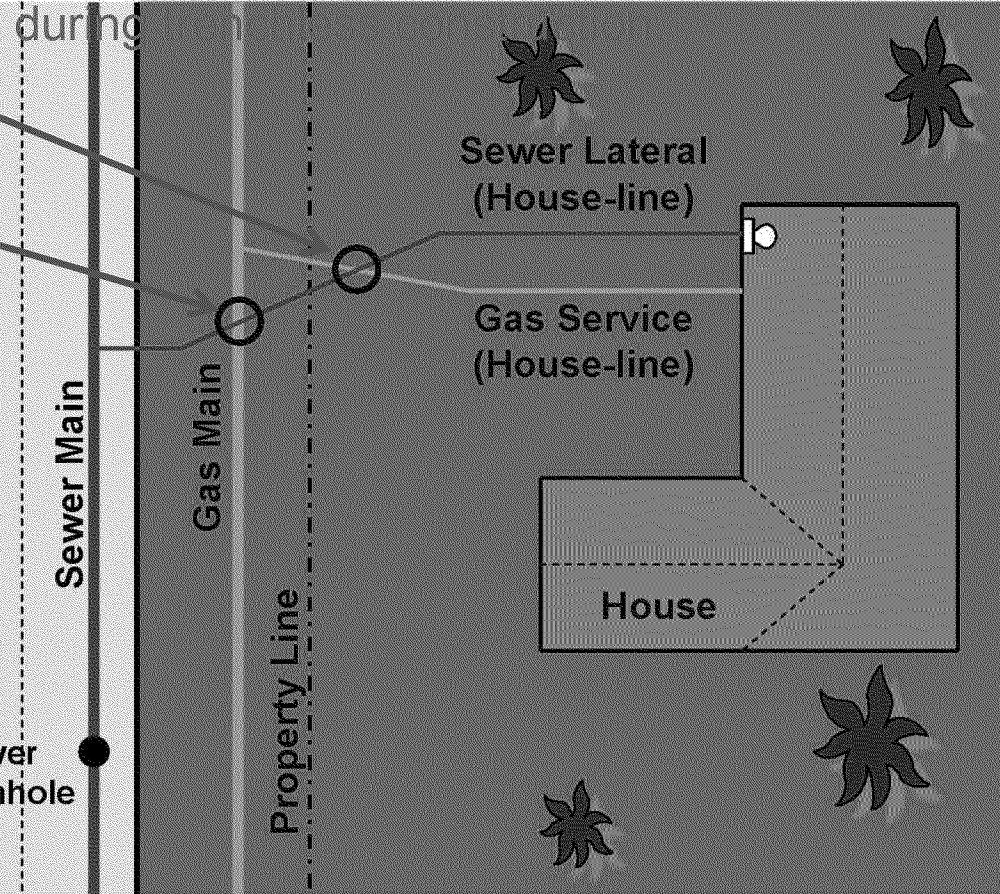


What is a Cross Bore?



What is a cross bore?

A cross bore is the inadvertent placement of a gas main or service through a sewer line. Sewer cross bores typically occur



What can happen as a result of a cross bore?

The sewer line may become blocked and need to be cleaned by a plumber or the building owner with mechanical cleaning tools. This may cause the gas line to be cut which could cause a release of gas.



Cross Bores – An Industry Issue

1976: First recorded instance of a Cross Bore

- Kenosha Wisconsin
- Fire, explosion, four injuries, one home destroyed and two adjacent homes damaged
- Investigated by NTSB

2004: Phoenix Arizona

- Fire, explosion, four injuries one home destroyed

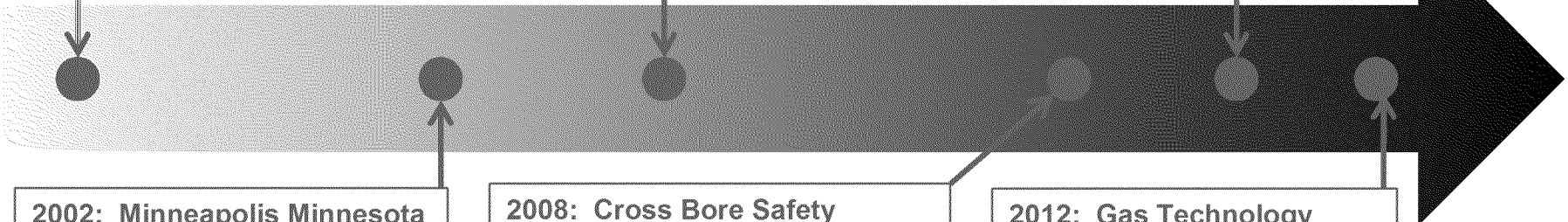
New York State

- Fire, explosion, one fatality, one home destroyed

2010: St. Paul Minnesota

- Fire, explosion, one injury, one home destroyed

AGA publishes report on Gas Pipelines and Unmarked Sewer Lines.



2002: Minneapolis Minnesota

- Fire, explosion and two homes destroyed

2008: Cross Bore Safety Association formed, a non-profit organization of construction, pipe manufacturer, inspectors and utility professionals

2012: Gas Technology Institute (GTI) publishes report on Cross-Bores Best Practice and Outreach Program

Best practices focus on:

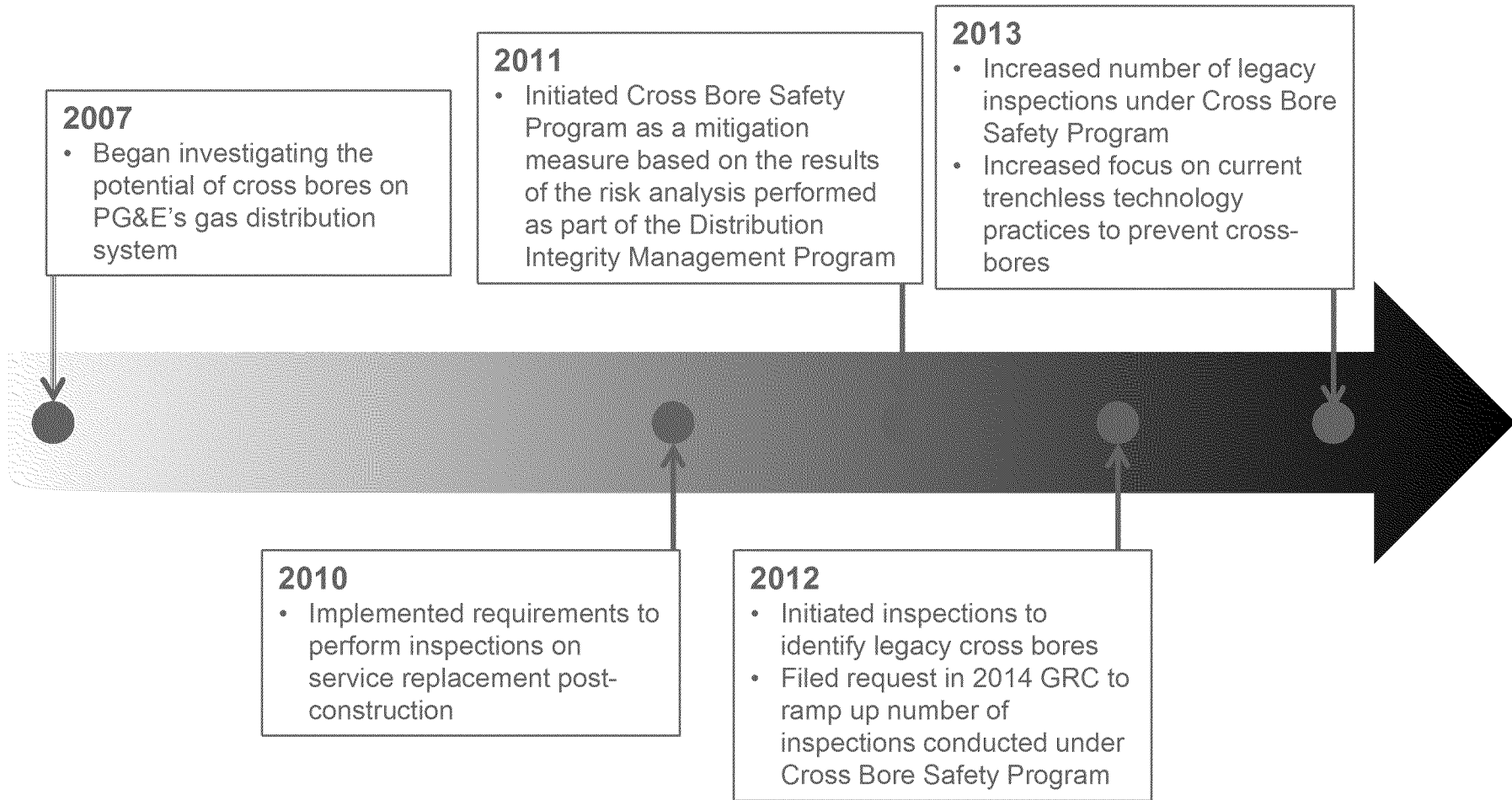
- Compliance, resources, awareness, records and risk assessment and mitigation

- Eighteen known cross bore incidents in U.S. since 2002¹
- Industry average cross bores estimated at 2-3 per mile of gas pipe and can be higher regionally, especially if sewer and gas lines are installed at the same depth²
- Incident in Minnesota resulted in a state mandated program to address cross bores³

¹ GTI "Mitigating the Risk of Cross-Bores", presentation to Northeast Gas Association, October 4, 2012
² Cross Bore Safety Association (CBSA), Legacy Cross Bores
³ Minnesota Department of Public Safety, State Fire Marshal and Pipeline Safety, Alert Notice, May 10, 2010



PG&E's History with Cross Bores⁴



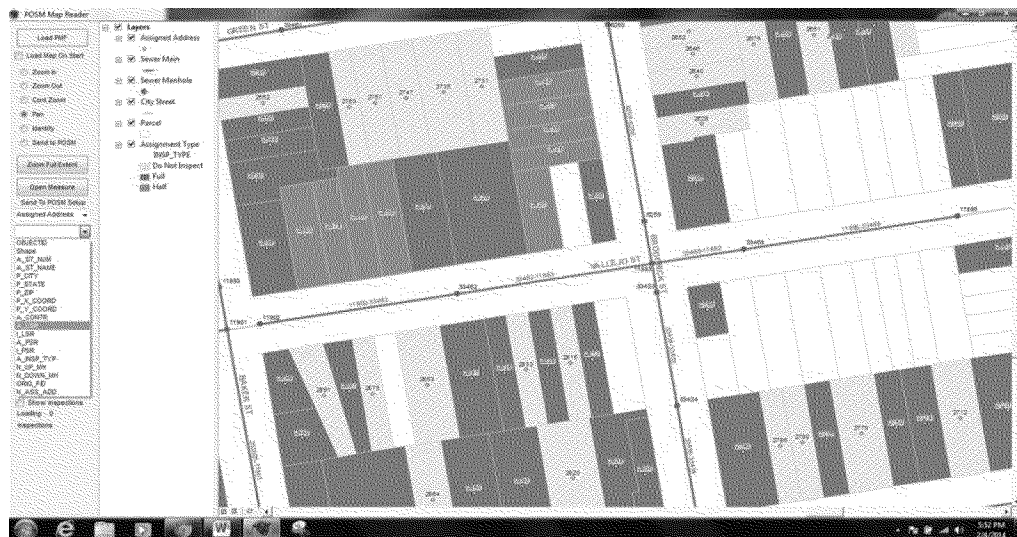
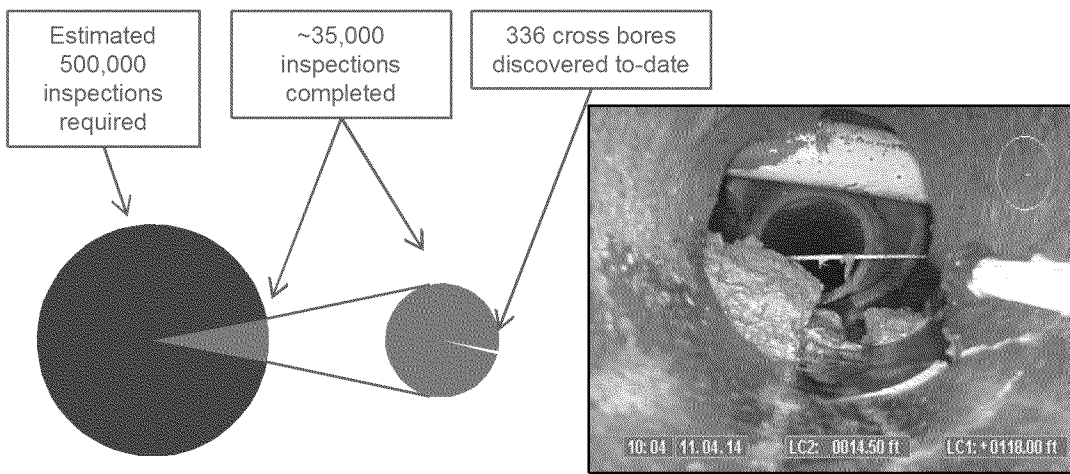
There have been 5 near hits since 2012 where cross bores were damaged and gas was released; however, the leak was mitigated before any property damage occurred.



PG&E's Cross Bore Safety Program

Legacy Inspections

- Camera inspections of sewer mains and laterals to locate potential legacy cross bores
- Risk-based prioritization of inspections based on public assembly locations and population density (e.g., schools, hospitals)
- Inspections focused on known locations of boring technology use
- Rigorous tracking of inspected parcels

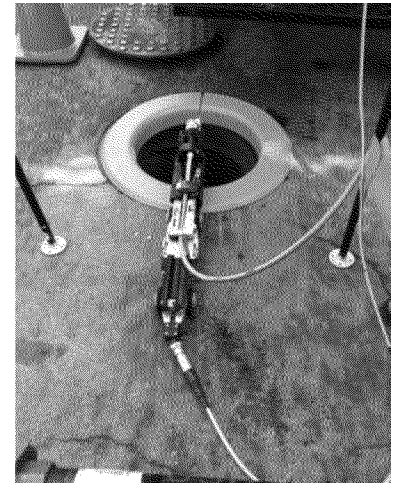


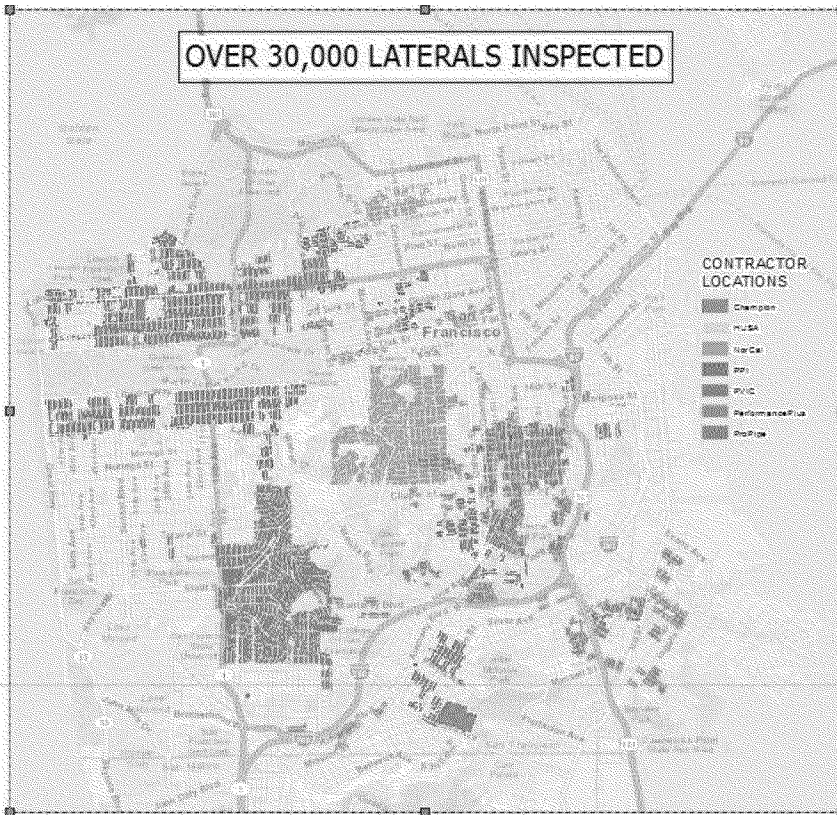


Inspection Methods

Camera equipment is either

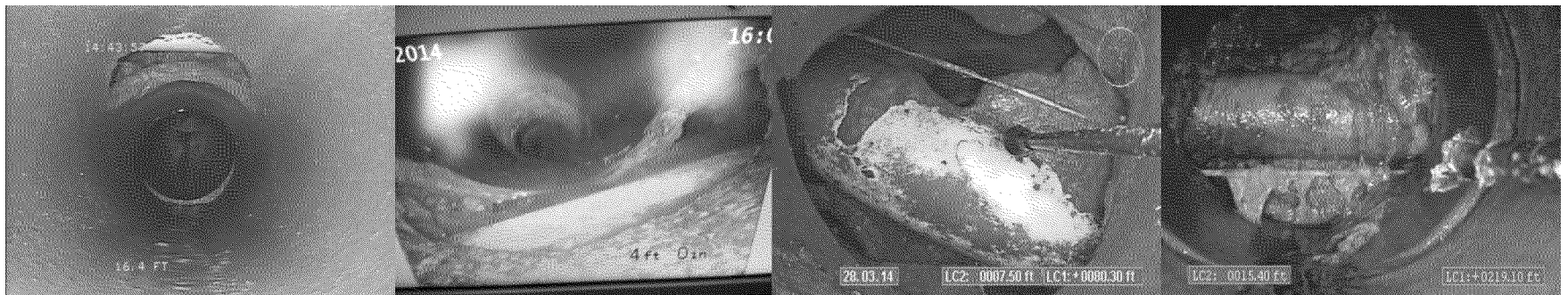
- Inserted into a sewer manhole and launched up each individual sewer lateral
- Inserted through a toilet, trap, or cleanout at the house and pushed to the street





When a cross bore is identified:

- Owner of sewer notified
- PG&E crews dispatched if blockage condition exists
- Gas line relocated out of sewer lateral
- Sewer repaired by licensed plumber
- Find rate is approximately 1 per 1,000 inspections or roughly 2 per mile of main, consistent with industry experience



- Materials distributed to key stakeholders explaining cross bores and requesting appropriate action when a cross bore is suspected.
- In 2012, PG&E sent safety brochures on Cross Bores to 12,500 sewer districts, public works agencies, plumbers, and equipment rental stores.
- In 2013, we completed two notifications totaling 25,000 brochures with an additional 283 mailings to sewer agencies and plumber unions.
- In 2014, in addition to our stakeholder mailings, we included cross bore information in March as a bill insert.

When Natural Gas Lines Intersect Sewer Lines
Safety Tips for Drain Cleaners, Sewer Cleaners, and Plumbers

CAUTION

Quando las tuberías de gas natural se intersectan con las tuberías de drenaje
Consejos de seguridad para plomeros, limpiadores de drenajes y limpiadores de alcantarillados

In a natural gas emergency call 911 and PG&E at 1-800-743-5000 immediately.
En una emergencia de gas natural, llame al 911 y a PG&E al 1-800-743-5000 de inmediato.

Safety Tips for Clearing Out a Sewer Lateral

The current practice involves using a trencher to dig a narrow trench to expose the sewer lateral. This trench is then excavated to the sewer lateral. The trencher is then used to dig a narrow trench to expose the sewer lateral. The trencher is then used to dig a narrow trench to expose the sewer lateral. The trencher is then used to dig a narrow trench to expose the sewer lateral.

Before Clearing: Look for signs of landscaping that could be causing the obstruction. If there are trees with the sewer pipe, they may be causing the obstruction. If there are trees with the sewer pipe, they may be causing the obstruction.

During Clearing: Use the least invasive equipment beyond first, use an auger, then a trencher. Do not use a trencher in a trench that is not a trencher.

After Clearing: Notify the utility line owner to locate the sewer lateral. Notify the utility line owner to locate the sewer lateral.

If you suspect a gas leak, immediately wear all appropriate safety gear, shut off the gas, and call PG&E at 1-800-743-5000 immediately.

Safety Tips for Drain Cleaners, Sewer Cleaners, & Plumbers

Check for a cross bore before you start.
If you are not sure, call PG&E at 1-800-743-5000 immediately.

How to use this brochure:

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Protecting in Your Community
Working in your area

When you see a worker in a trench, call PG&E at 1-800-743-5000 immediately.

What to expect:

- A worker in a trench may be working on a sewer line.
- A worker in a trench may be working on a gas line.
- A worker in a trench may be working on a water line.

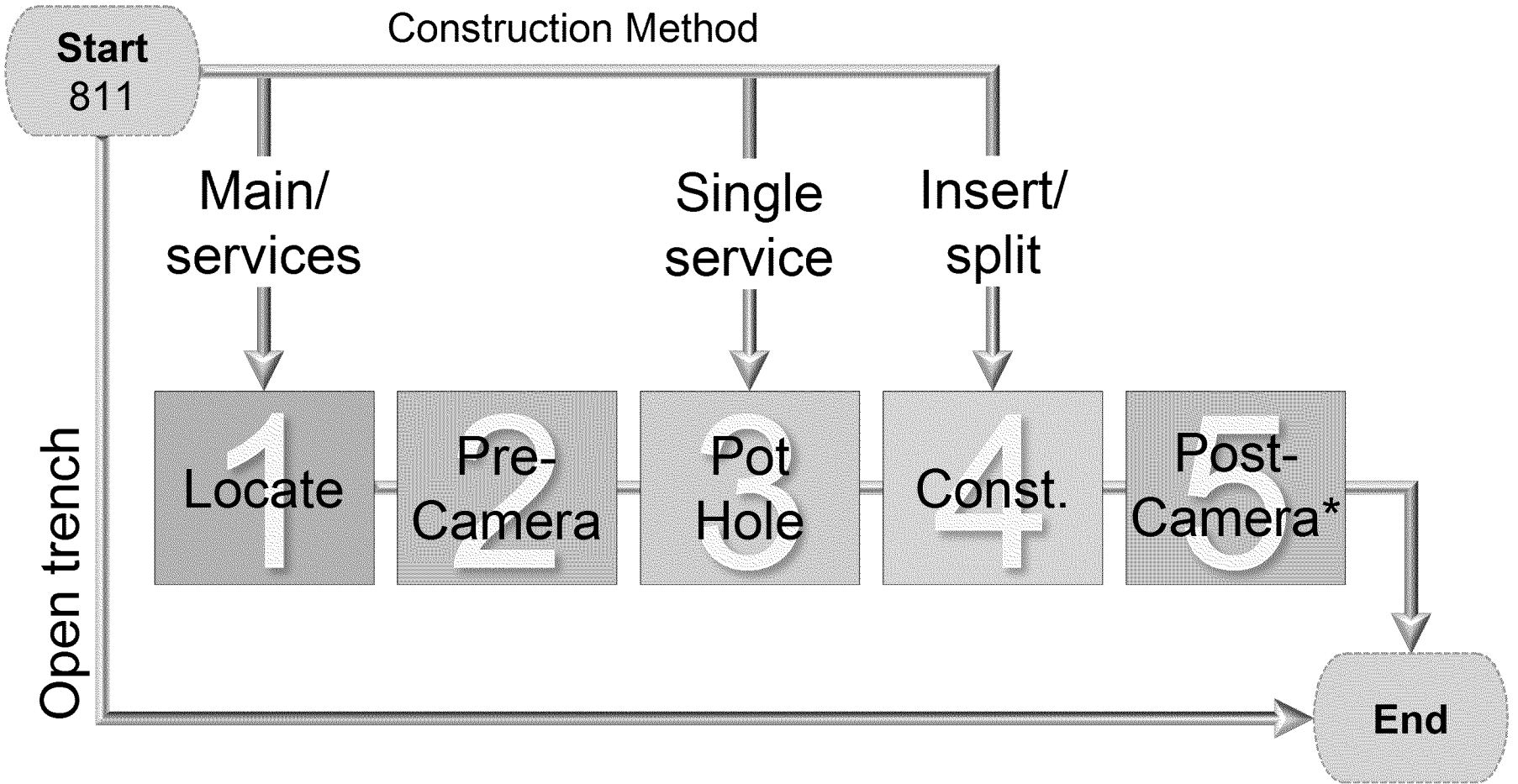
What to do:

- Stay away from the trench.
- Do not touch anything in the trench.
- Do not enter the trench.



Cross Bore Prevention Process

(Currently being piloted in San Francisco and Peninsula regions)



* Perform before job closeout if pre-locate was completed.
Perform within 24 hours if NO pre-locate was completed.



Benchmark Results

Program	Benchmark Source	Comments
Legacy	American Gas Association Survey	PG&E provides public outreach consistent with the industry best practices. Not all utilities have legacy inspection programs.
Prevention	American Gas Association Survey Gas Technology Institute (GTI) Local and National Contractors	PG&E's new procedures implements best practices to ensure crossbores are not created as we require 100% post-construction inspection.
	Other Major US Utilities	PG&E is not only consistent with practices followed by other major US utilities but also meets best practices outlined in GTI's "Cross Bore Best Practices – Best Practices Guide".