

# It's Crowded in There

How PGW Manages Pipeline Installation in a  
Congested Underground

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Philadelphia Gas Works

# Summary

- Philadelphia by the numbers
- Philadelphia Gas Works by the numbers
- Design Considerations
- Installation Techniques
- Above Ground Considerations

# Philadelphia – “City of Brotherly Love”

- 6<sup>th</sup> Largest City in US
- Population – 1,567,872
- Population Density – 11,692/mi<sup>2</sup>
- Highly Congested Urban Environment



# Philadelphia Gas Works

## Company Background

- Largest Municipal Natural Gas Distributor in U.S.
- Service Territory – City of Philadelphia
- Established in 1836



# Philadelphia Gas Works

## By the Numbers

- Service Territory – 134.1 mi<sup>2</sup>
- 565,000 Customers
- 3,031 miles of main
- 475,000 services
- Approximately 1,600 Employees

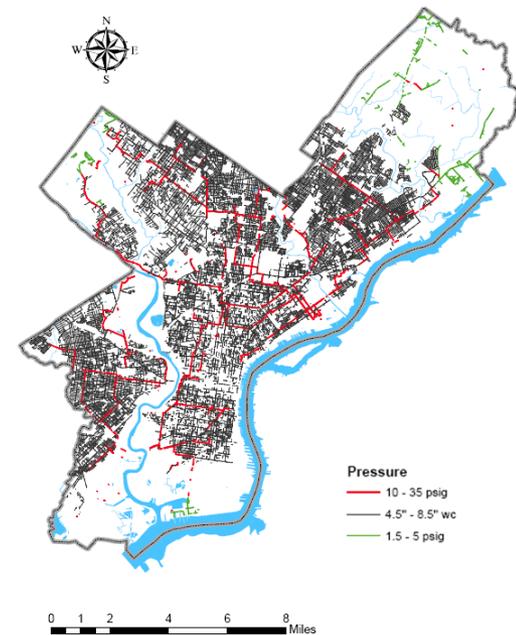


# Infrastructure Challenges

- Aging infrastructure – 68% of PGW's mains are CI or Unprotected STL

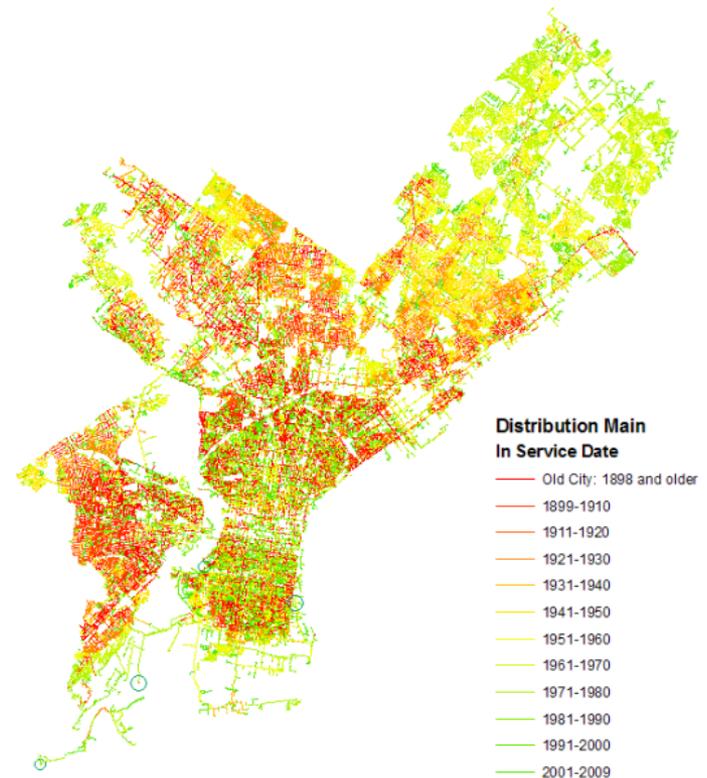


Philadelphia Gas Works  
Cast Iron Mains by Pressure



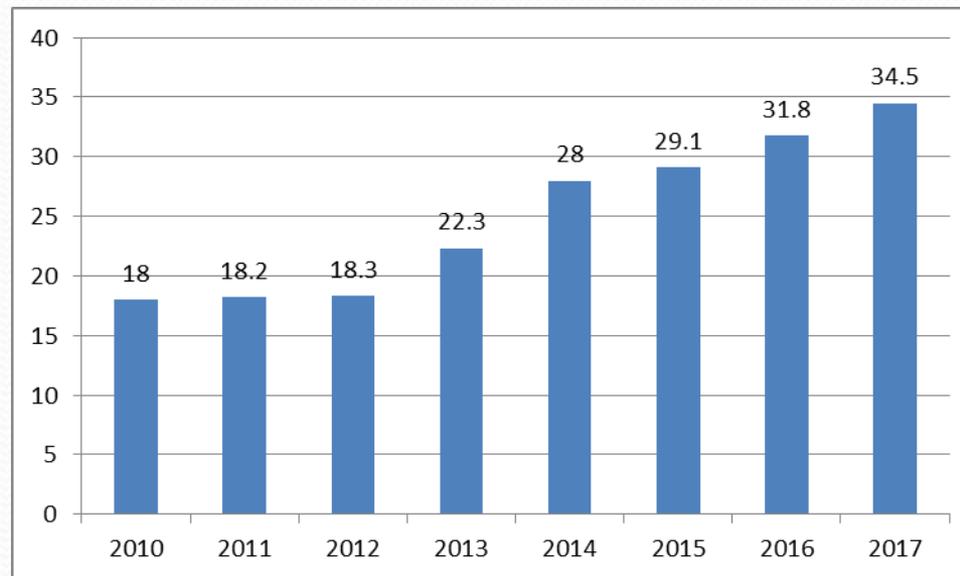
# Infrastructure Challenges

- Aging infrastructure – 37% of PGW's mains were installed pre 1940



# Main Replacement Program

- PGW continually increases Cast Iron replacement each year

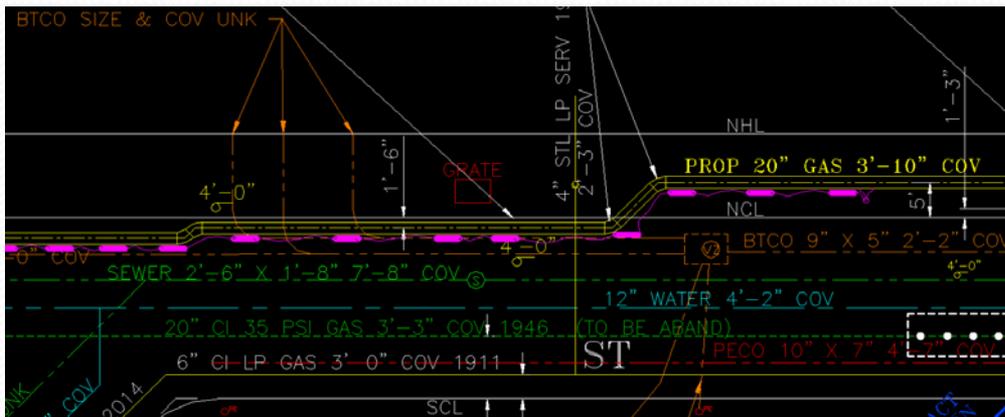
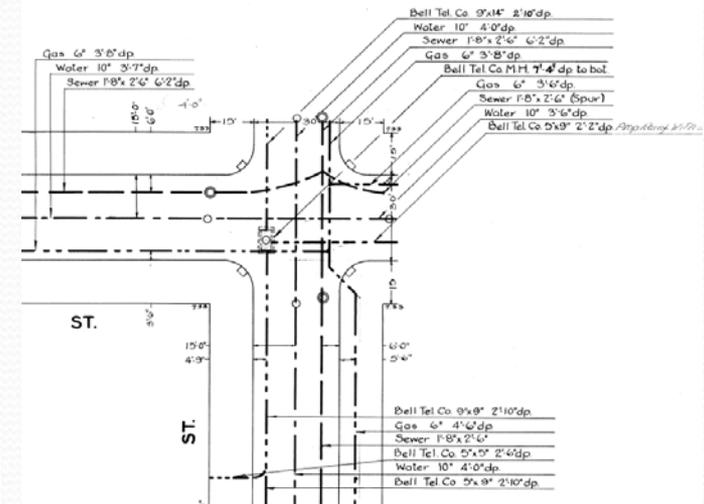


# How Do We Manage?



# Design Considerations

- Information Gathering
- PA One Call – Design Tickets
- City Highway Supervisor Plans
- Streets Dpt Permit Process- GPIS

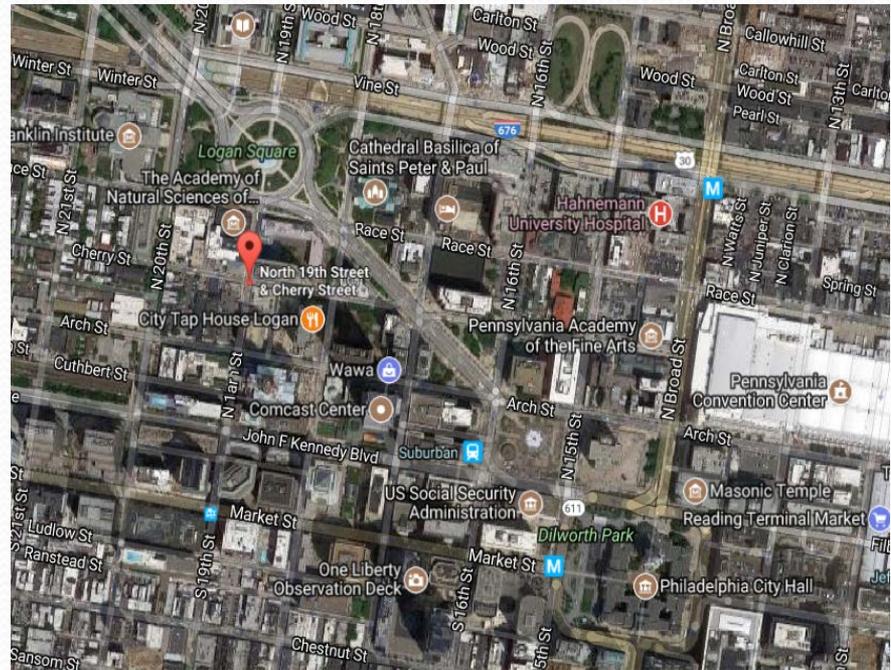


# Route Selection

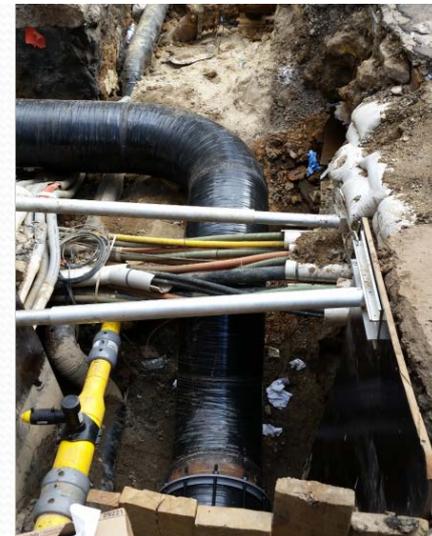
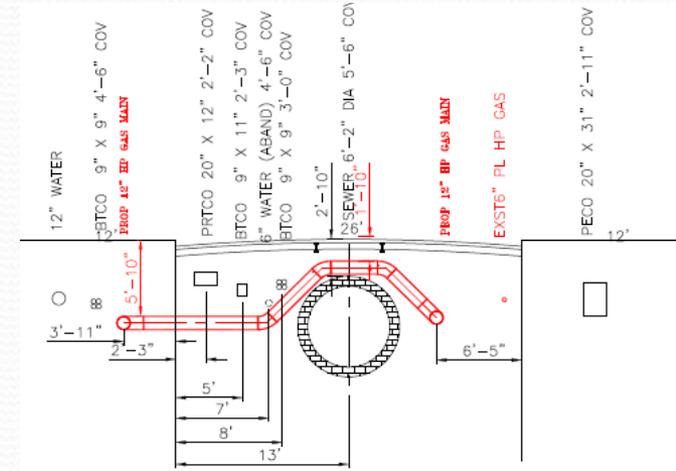
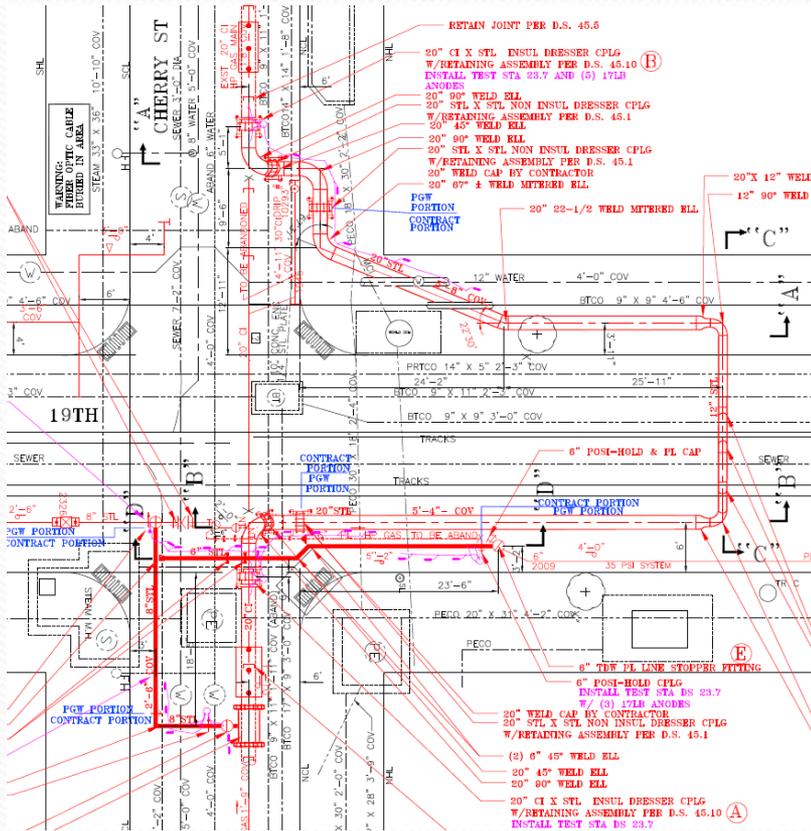
- Utilizing route of abandoned utilities or existing main
- Alternate Routes
- Network Analysis for Pipe Sizing



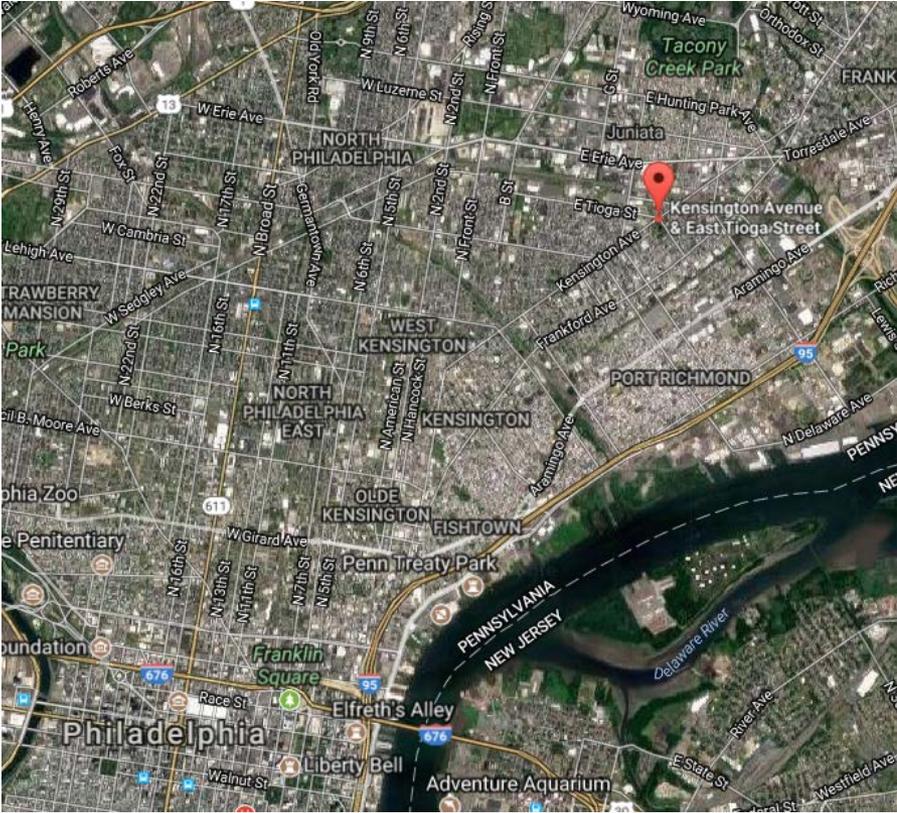
# 19<sup>th</sup> & Cherry Streets



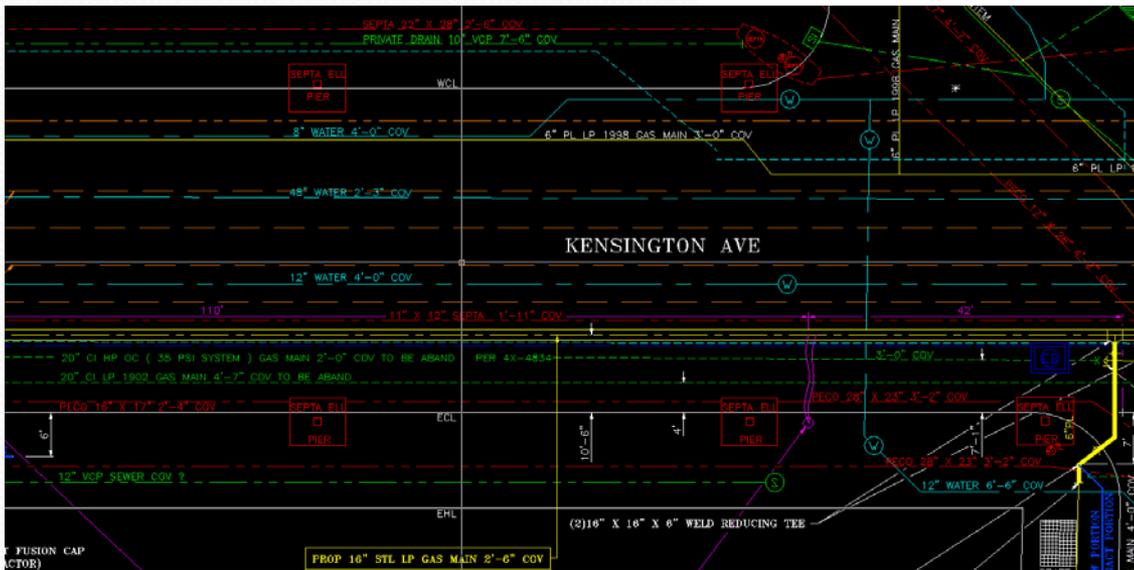
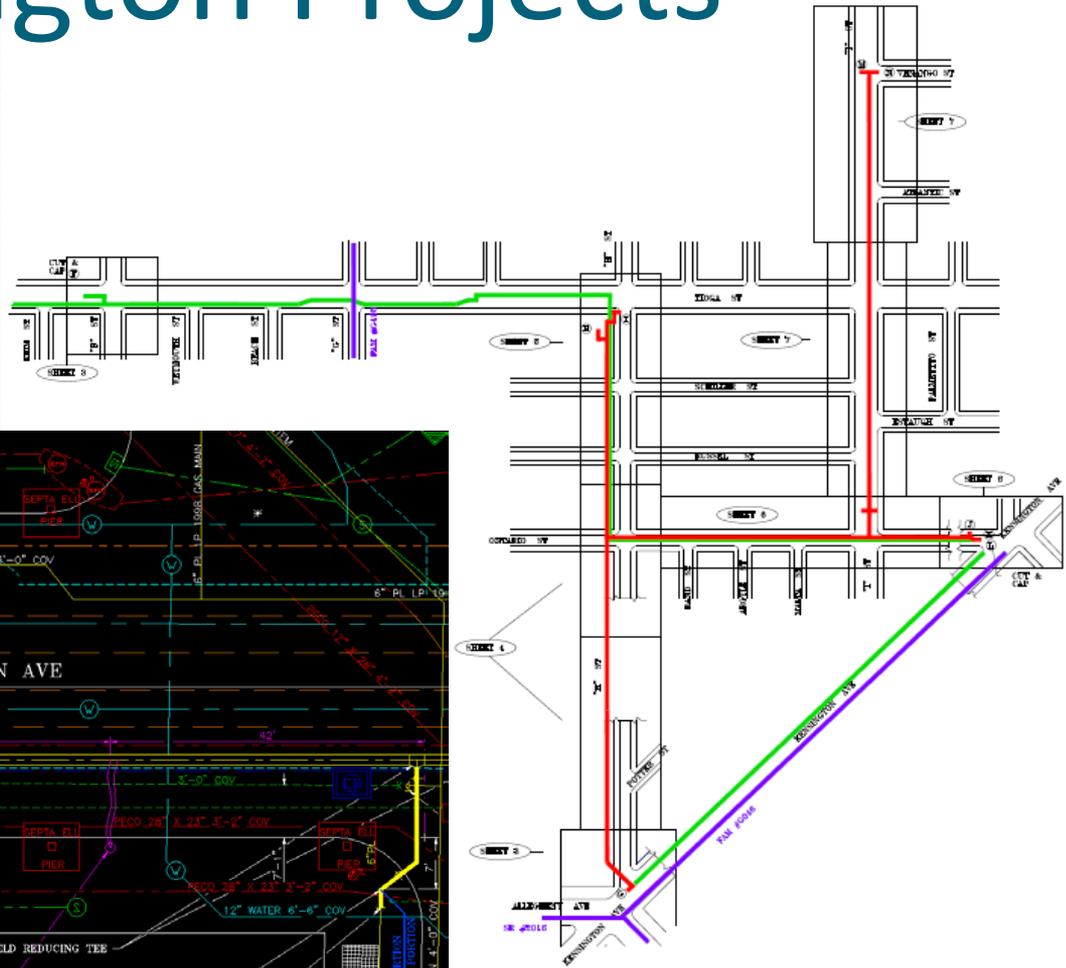
# 19th & Cherry Streets



# Tioga/Kensington Projects



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# Potholing/Daylighting

- Utilize PGW manpower
- PGW Contract Language
  - Contractor shall excavate test holes to determine and verify planned route
- Pennsylvania Act 287 – One Call
  - Contractor shall notify PA One Call System and other utilities



# Vacuum/Hydro Vac Technology

- Utilizes powerful suction hose and/or high pressure water to conduct a “soft dig”
- Spoil tank to store soil
- 2.6-13 cy/hr depending on soil type
- .33 cy/hr hand digging



# Vacuum/Hydro Vac Technology

- Pros

- Efficiency – faster than hand dig
- Increased Safety – Soft Dig
- Cuts precise trenches
- Tight Spaces

- Cons

- Messy – leaves trench wet/muddy
- cement/asphalt removal
- Need clean fill
- If open route, conventional excavation faster



# Pipe Insertion

- Utilizing existing pipe as a carrier for new plastic main
- Saves on excavation and paving costs
- Factors of Consideration
  - Network Analysis for capacity needs
  - Size of Push/Receiving Pits
  - Number of services



# Pipe Lining

- Minimally invasive process which allows for the rehabilitation of existing pipe
- Benefits
  - Cost Savings – 40% on Pilot Project
  - Entire length & fittings are protected
- Drawbacks
  - Can main be out of service?
  - Offsets, services, branches
  - Finite pull lengths
  - Curing temperatures



# Horizontal Directional Drilling

- Steerable trenchless method of installing pipe along a prescribed bore path
- Benefits
  - Speed of install
  - minimum environmental impact
  - Minimal interference with roadway traffic



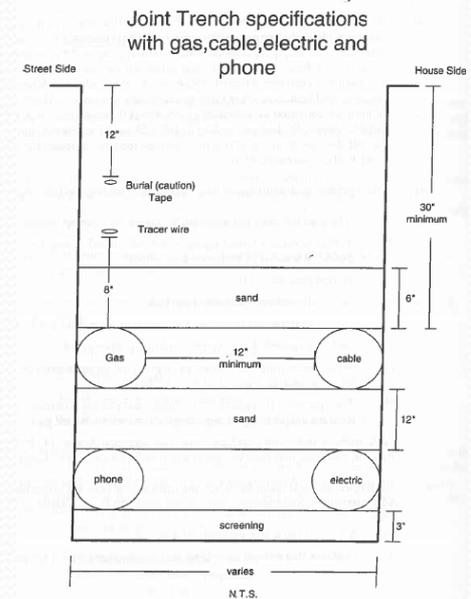
# Horizontal Directional Drilling

- Factors to Consider
  - Sufficient clearance between structures
    - within 2' must be exposed
  - 18" separation
  - Visual observation of sewer laterals before bore
  - Post inspection of sewer laterals
  - Free of rock, concrete, broken foundation
  - 36"-48" depth



# Joint Trenching

- Installation of multiple utilities in one trench
- Mainly New Construction/New Roadway
- Benefits
  - Lower Cost
  - Builder digs, backfills, paves
- Requirements
  - Street side, top utility
  - Minimum 30" cover – 192.327
  - 12" from power conductors – 192.325



Note: Gas main is to be placed on the street side of the trench

PGW

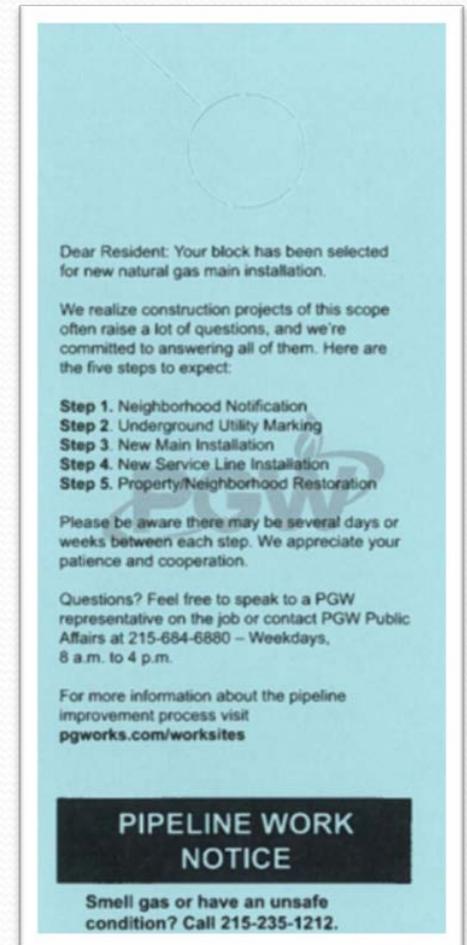
# Above Ground Congestion

- Just as crowded above as it is below
- Need proper coordination and notification
  - Both PGW and Contractor



# Above Ground Congestion

- Contractor
  - Pre Construction Meetings
  - Post No Parking Signs 3-5 days advance
  - Hand out Door Hanger Notification



# Above Ground Congestion

- PGWORKS.com/worksites
  - Interactive map
    - Every project listed by zip code
    - Customer feedback survey
    - 5 Steps of Pipeline Improvement Customer Guide
  - Social Media – Nextdoor, Facebook, Twitter
  - Coordination with other City Agencies
  - Email outreach to community organizations and elected officials



# Above Ground Congestion

- Interactive Map

## PIPELINE IMPROVEMENT

[HOME](#) / [ABOUT US](#) / PIPELINE IMPROVEMENT

### CURRENT WORKSITES

[VIEW WORK IN YOUR ZIPCODE](#)

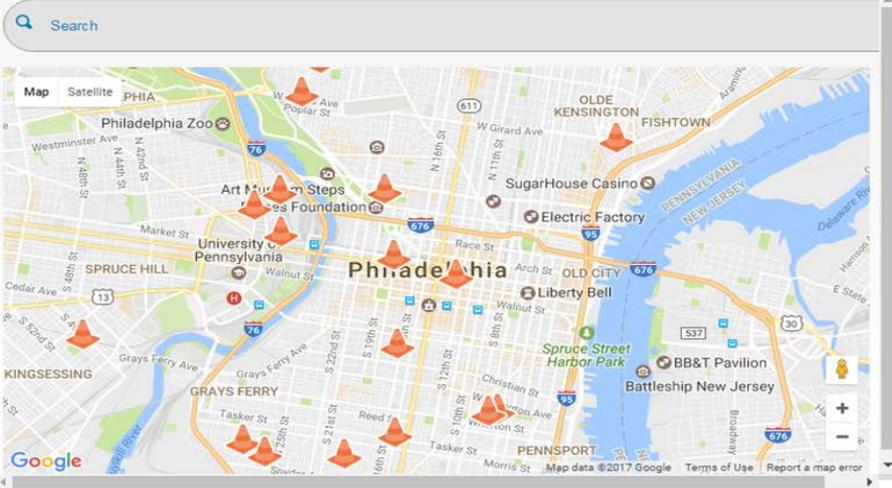
[WHAT TO EXPECT?](#)

PGW is now on Nextdoor, a free private social networking website for your neighborhood. Join Nextdoor and get worksite updates and communicate directly with us!

 Connect with us on **Nextdoor**

### PGW WORKSITES MAP

See where PGW is working next? Enter your street address with zip code to check the map.



**Note: All dates listed on the PGW interactive map are subject to change.**

# Above Ground Congestion

- 5 Steps of Pipeline Improvement
  - 1: Neighborhood Notification
  - 2: Underground Utility Marking
  - 3: New Main Install
  - 4: New Service Line Install
  - 5: Property/Neighborhood Restoration

Dear Resident: Your block has been selected for new natural gas main installation.

We realize construction projects of this scope often raise a lot of questions, and we're committed to answering all of them. Here are the five steps to expect:

**Step 1. Neighborhood Notification**  
**Step 2. Underground Utility Marking**  
**Step 3. New Main Installation**  
**Step 4. New Service Line Installation**  
**Step 5. Property/Neighborhood Restoration**

Please be aware there may be several days or weeks between each step. We appreciate your patience and cooperation.

Questions? Feel free to speak to a PGW representative on the job or contact PGW Public Affairs at 215-694-8880 – Weekdays, 8 a.m. to 4 p.m.

For more information about the pipeline improvement process visit [pgworks.com/worksites](http://pgworks.com/worksites)

**PIPELINE WORK NOTICE**

Smell gas or have an unsafe condition? Call 215-235-1212.

As part of the natural gas pipeline improvement project in your neighborhood, PGW needs to gain access to your home to transfer your gas service line to the new main and perform safety checks at your gas meter. A separate technician will arrive afterwards to re-light your appliance(s) and perform a final safety check of the property.

Our Construction Foreman would like to schedule this service work for your property on:

If you are unable to make this appointment time, please contact the Foreman.

FOREMAN: \_\_\_\_\_

TELEPHONE: \_\_\_\_\_

We appreciate your cooperation as we work to improve the safety and reliability of our natural gas system in Philadelphia.

For more information about the pipeline improvement process visit: [pgworks.com/worksites](http://pgworks.com/worksites)

**SERVICE RECONNECTION NOTICE**

Smell gas or have an unsafe condition? Call 215-235-1212.

To complete the natural gas pipeline improvement project in your neighborhood, a PGW paving contractor is scheduled to permanently restore areas impacted by our work – roadways, sidewalks, lawns and driveways.

Your continued cooperation with restricted parking and barricaded areas is appreciated and will help our crews to work safely and efficiently.

Paving work is weather-dependent so estimated completion times may vary, but we are committed to completing the restoration in the most timely manner possible.

Questions? Feel free to speak to a PGW representative on the job or contact PGW Public Affairs at 215-694-8880 – Weekdays, 8 a.m. to 4 p.m.

We appreciate your cooperation as we work to improve the safety and reliability of our natural gas system in Philadelphia.

Let us know how we did.

Visit: [pgworks.com/worksites](http://pgworks.com/worksites) to complete our survey.

**STREET PAVING NOTICE**

Smell gas or have an unsafe condition? Call 215-235-1212.

# Thank You!

