

Damage Prevention Training 2023

EXCAVATOR SAFETY

BY: NEW JERSEY UTILITIES



Mission

- Our mission is to promote education and awareness and foster a partnership with all of you to help protect our infrastructure, your companies and our communities.



**Know what's below.
Call before you dig.**

It's the Law!

It's The Law & It's Free!

- In New Jersey it's illegal to dig anywhere in the state without first calling for a markout.
- Calling **811** or **1-800-272-1000** gets your utility lines marked and helps protect you from potential injury and unnecessary expense.



**Know what's below.
Call before you dig.**

It's the Law!

Hours for the NJ One Call Center

Contact the NJ One Call Center
7 days a week, 24 hours a day,
any day of the year.



One Call:
811 or 800-272-1000
ITIC & Fax
www.nj1-call.org

Who Should Call the NJ One Call Center?

"Excavate" or "excavation" or "demolition" means any operation in which earth, rock or other material in the ground is moved, removed or otherwise displaced by means of any tools, equipment or explosive

Up to and Including:

- Planting a Tree
- Mailbox
- Fencing & Dog Fence
- Sidewalks, Curbs
- Moving Dirt
- Pest Control
- Sprinkler
- Stump Removal
- Roadway Signs/Real Estate Signs
- Excavation
- Demolition
- Road Milling/Paving
- Paving
- Driveways
- Drainage
- Sewer or Water
- Utility

Ways to Call in or Process Markout Requests

Call 811 or 1-800-272-1000

- Speak directly with a customer service representative

Remote Entry (ITIC)

- Your company can enter their request using the web service known as ITIC (for “Internet Ticketing”). User will have a secure login using their email address, pass code and training. Please e-mail them at NewJerseyITIC@occinc.com for your pass code.

Fax

- Using the New Jersey One Call form. See fax locate agreement form and fax form that must be used to submit your request on web site at www.nj1-call.org



What Type of Ticket Does the NJ One Call Center Process?

Routine:

- Must wait 3 business days for a markout. Begin digging within 10 business days. Tickets expires in 45 business days.

Update:

- Reason to update your routine ticket, mismarked & not marked Underground Facilities.

Emergency:

- Any condition constituting a clear and present danger to life, health or property caused by the escape of any material or substance transported by means of an underground facility or interruption of a vital communication or public service that requires immediate action.

TIMEFRAME MATRIX

MON.	TUES.	WED.	THUR.	FRI.	SAT.	SUN.	MON.	TUES.	WED.	THUR.	FRI.
CALL-	MARKOUT	MARKOUT	MARKOUT	DIG							
	CALL-	MARKOUT	MARKOUT	MARKOUT	DIG						
		CALL-	MARKOUT	MARKOUT	*	*	MARKOUT	DIG			
			CALL-	MARKOUT	*	*	MARKOUT	MARKOUT	DIG		
				CALL-	*	*	MARKOUT	MARKOUT	MARKOUT	DIG	
					CALL-	CALL-	CALL-	MARKOUT	MARKOUT	MARKOUT	DIG
					*	CALL-	CALL-	MARKOUT	MARKOUT	MARKOUT	DIG
CALL-	MARKOUT	HOLIDAY *	MARKOUT	MARKOUT	DIG						
	CALL-	MARKOUT	HOLIDAY *	MARKOUT	*	*	MARKOUT	DIG			

CALL-	Start of the 10 Day time frame
DIG	7 Business days to start job
*	Saturday, Sunday and Holidays

- * Contractors option to dig on Saturday, Sunday or Holiday once ticket is valid
- * Saturday, Sunday and Holidays do not count in three business days allowed for markout
- Any request received at One-Call Center on a Saturday, Sunday or Holiday is considered requested the next business day

New Jersey State Holidays

New Year's Day
 Martin Luther King Jr.
 President's Day
 Good Friday

Memorial Day
Juneteenth
 Independence Day
 Labor Day
 Columbus Day

Election Day
 Veteran's Day
 Thanksgiving Day
 Christmas Day

Before Contacting the NJ One Call Center:

1. County
2. Municipality
3. Address
4. Nearest Intersection
5. Other Intersection
6. Type of Work
7. Extent of Work
8. White Painted Area
9. Who are you working for
10. Excavator or Homeowner's Information



New Jersey One Call System

Transmit: Date: 02/16/23 At: 14:08

*** ROUTINE *** Request No.: 123456789

Underground Facility Operators Notified:

BAN = VERIZON EG1 = ELIZABETHTOWN GAS COMPANY
MCI = MCI MWC = MIDDLESEX WATER COMPANY
P SCE = PSE&G ELECTRIC

Start Date/Time: 02/23/23 At 00:01

Start By Date : 03/03/23 Expiration Date: 04/24/23

Location Information:

County: MIDDLESEX Municipality: WOODBRIDGE

Subdivision/Community:

Street MAIN ST

Nearest Intersection: ST JAMES AVE

Other Intersection: OAK AVE

Lot/Lot:

Type of Work: SEARCH AND REPAIR GAS LEAK

Block: Lot: Depth: 7FT

Extent of Work: CURB TO CURB. CURB TO ENTIRE PROPERTY. CURB TO 25FT BEHIND
OPPOSITE CURB.

Remarks:

Working For Contact: JAMES SKELLINGER

Working For:

Address:

City:

Phone:

Excavator Information:

Caller: JAMES SKELLINGER

Phone:

Excavator:

Address:

City:

Phone: Ext: Fax:

Cellular:

Email

End Request

NJ One Call Markout Ticket

NJ One Call Emergency Markout Ticket

Transmit: Date:

*** E M E R G E N C Y

*** Request No.: 230030728

AGT = ALGON/TEXAS EASTERN GAS T AM2 = AT&T CORP
BAN = VERIZON BUK = BUCKEYE PARTNERS
CC7 = COMCAST CABLEVISION OF NE CCP = CROWN CASTLE
EG1 = ELIZABETHTOWN GAS COMPANY IPMF1 = PENTA COMMUNICATIONS
JOB801 = JOB 8, LLC. LKT = CENTURYLINK
MCI = MCI MFR = ZAYO GROUP
Underground Facility Operators Notified:

Start Date/Time: 01/03/23 At 09:00

Start By Date : 01/03/23

Expiration Date: 2/24/23

Location Information:

County: MIDDLESEX

Municipality: WOODBRIDGE

Subdivision/Community: AVENEL

Street: 100 US HWY 1

Nearest Intersection: RANDOLPH AVE

Other Intersection: PRODUCTION WAY

Lat/Lon:

Type of Work: EMERGENCY - SEARCH/REPAIR GAS LEAK

Block: Lot: Depth: 5FT

Extent of Work: CURB TO ENTIRE PROPERTY.

Remarks:

Working For Contact:

Working For

Address:

City:

Phone:

Excavator Information:

Caller:

Phone:

Excavator:

Address:

City:

Phone:

Cellular:

Email:

Positive Response

Once the facility operator or locating company performs the locate, you will receive a positive response, provided an email or fax have been given during the initial call. This notification will let you know what facilities are marked or cleared. It will also show you who has not responded as of the email or fax date. On Emergencies you will see a new Dispatched feature. Remember you still will not be able to dig until your start dig date.

Ticket Number:230030728





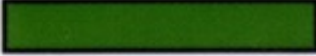
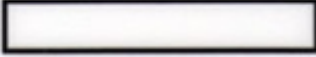
Location: 100 US HWY 1, WOODBRIDGE, NJ

As of 01/02/23 9:00 AM EST, participating facility owners have responded to Ticket Check as follows:

District Code	Status
VERIZON	Clear/No conflict
PENTA COMMUNICATIONS	Marked
MCI = MCI	Not yet responded
AGT = ALGON/TEXAS EASTERN GAS	Not yet responded
EG1 = ELIZABETHTOWN GAS	Dispatched (Emergencies only)

What Do the Colors Mean?

COLOR CODE FOR MARKING UNDERGROUND UTILITY LINES

	ELECTRIC
	GAS-OIL-STEAM
	COMMUNICATION CATV
	WATER
	SEWER
	PROPOSED EXCAVATION



Know what's below.
Call before you dig.
or
1-800-272-1000

**NEW JERSEY ONE CALL
CALL FOR FREE MARKOUTS
3 FULL DAYS BEFORE YOU DIG**

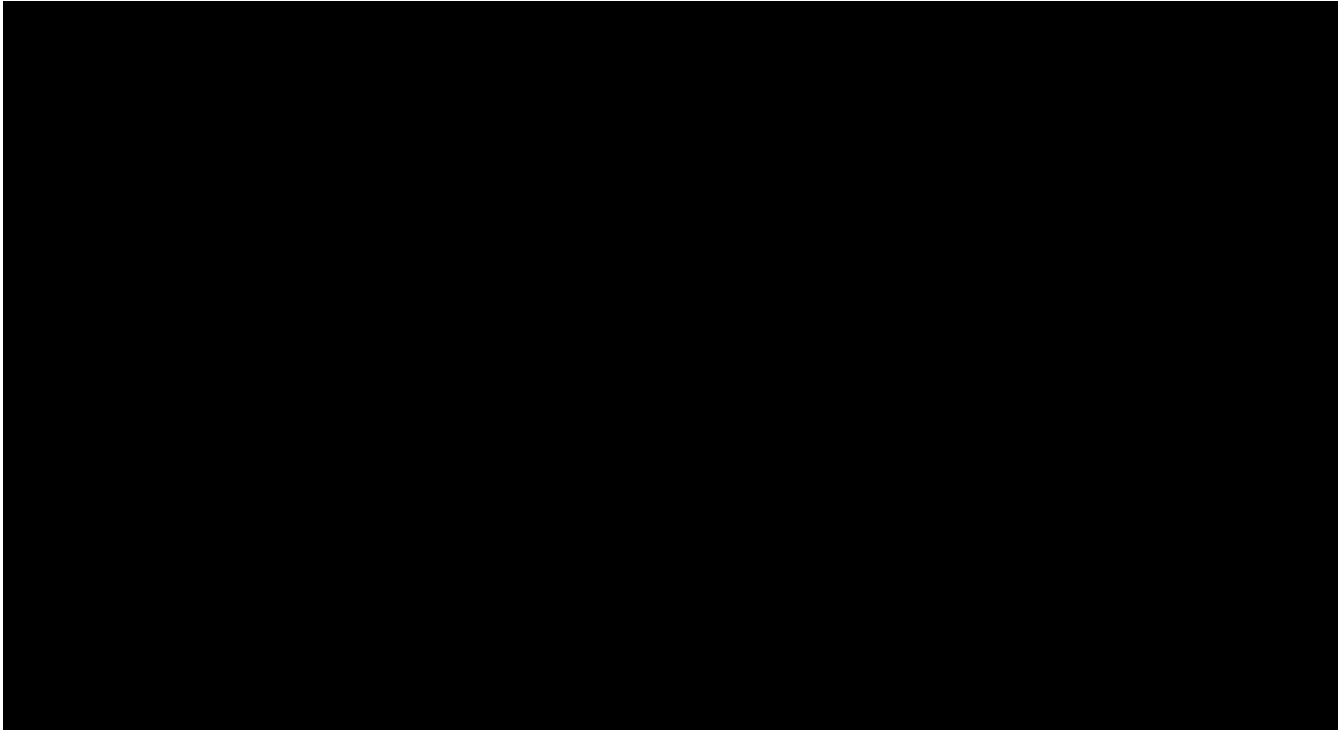
Things to Know:



- Call 3 business days ahead, but not more than 10 business days
- All excavators must have their own markout request
- Must provide physical location of dig site – not postal address
- Excavators must verify their location, dig date and have copy of request (ticket) on site
- Excavation must begin 10 business days or request (ticket) is no longer valid
- Excavator must protect and preserve marks until no longer necessary

Things to Know:

- Plan the excavation or demolition with reasonable care to avoid damages
- Support and protect facilities from traffic and other hazards
- Request (ticket) expires in 45 business days
- If your project will extend past 45 business days you must call for a new markout for the project to continue



QUIZ!

- How many days after calling 811 to request a utility markout can you start digging?
 - 3 BUSINESS Days
- If I see marks on the ground do I still need to call 811?
 - Yes, all excavators need their own VALID markout request.
- What color are the electric markouts?
 - Red

Who Marks the Lines?

- The utility companies are responsible to mark out their facilities or lines
- Often, they will hire a third party to do their markouts
- Privately owned facilities (after the meter) are the responsibility of the property owner



**Know what's below.
Call before you dig.**

How Lines are Marked



Flag Standards N.J.A.C. 14.2-5.2




NJ ONECALL NEW QR CODE





11:42 5G 70%

Ticket Information


Ticket Number:

Start Date:
 


End Date:
 

Header:
 

Excavator Information

Company 

Excavation Information

Type Of Work 

III O <

White Paint Area

N.J.S.A. 14:2-3.2 Notice of intent to excavate – contents, perimeter marking

(c) Where appropriate to clearly identify the site of a planned excavation or demolition, an excavator or responsible contractor may choose to mark the perimeter of the site in white, prior to notifying the One Call Center. White perimeter marking is encouraged in order to minimize unnecessary marking and locating by the underground facility operators.



For example – use marking to indicate small sites, nonlinear excavations, and spot excavations such as a soil borings, mailboxes, sign posts, or tree planting.



Perimeter

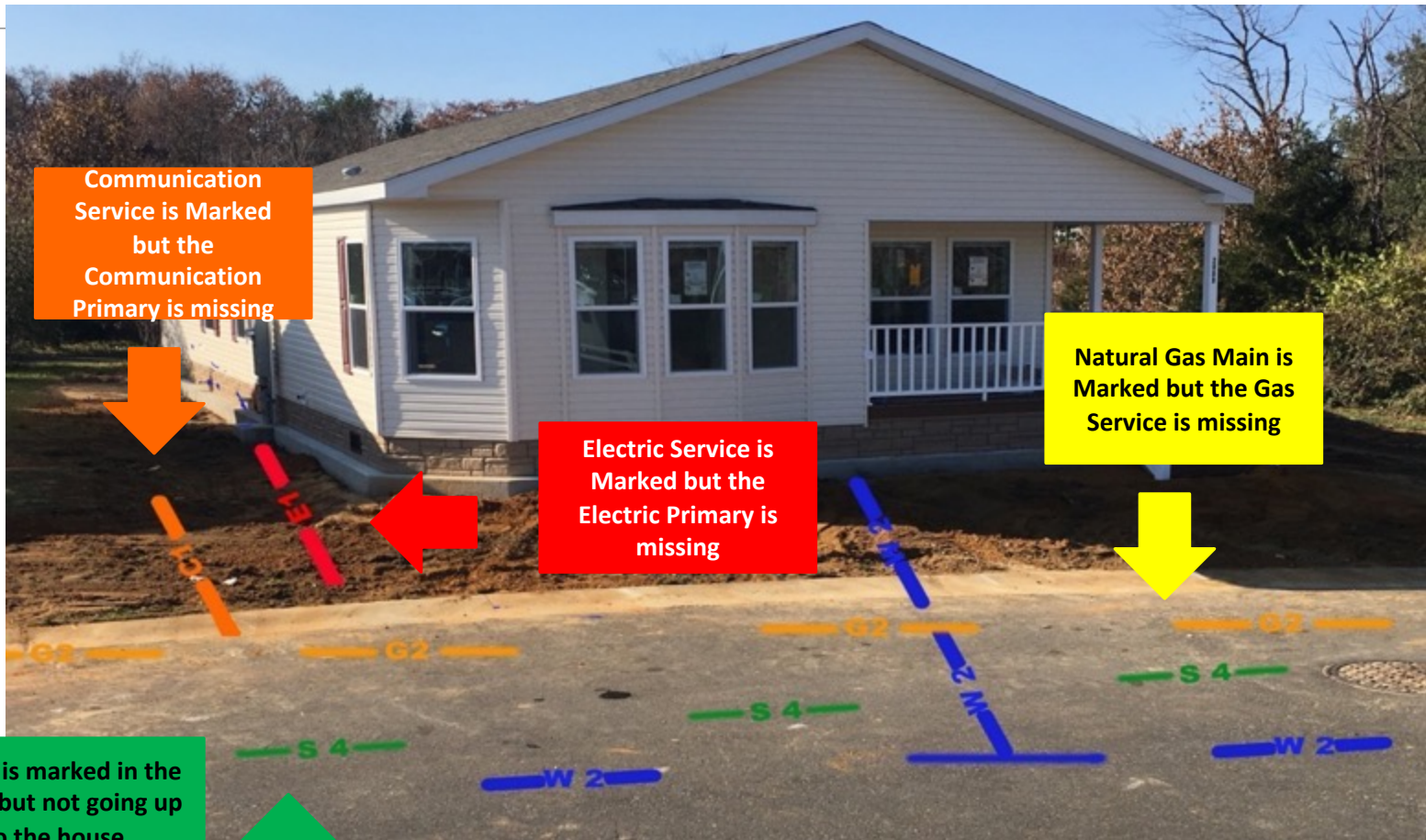
Unmarked Lines

What should I do if there are visible signs that a utility is in my work area and it was not marked?

- Call the NJ One Call Center with your original ticket number and advise the customer service representative of the company that did not mark out.

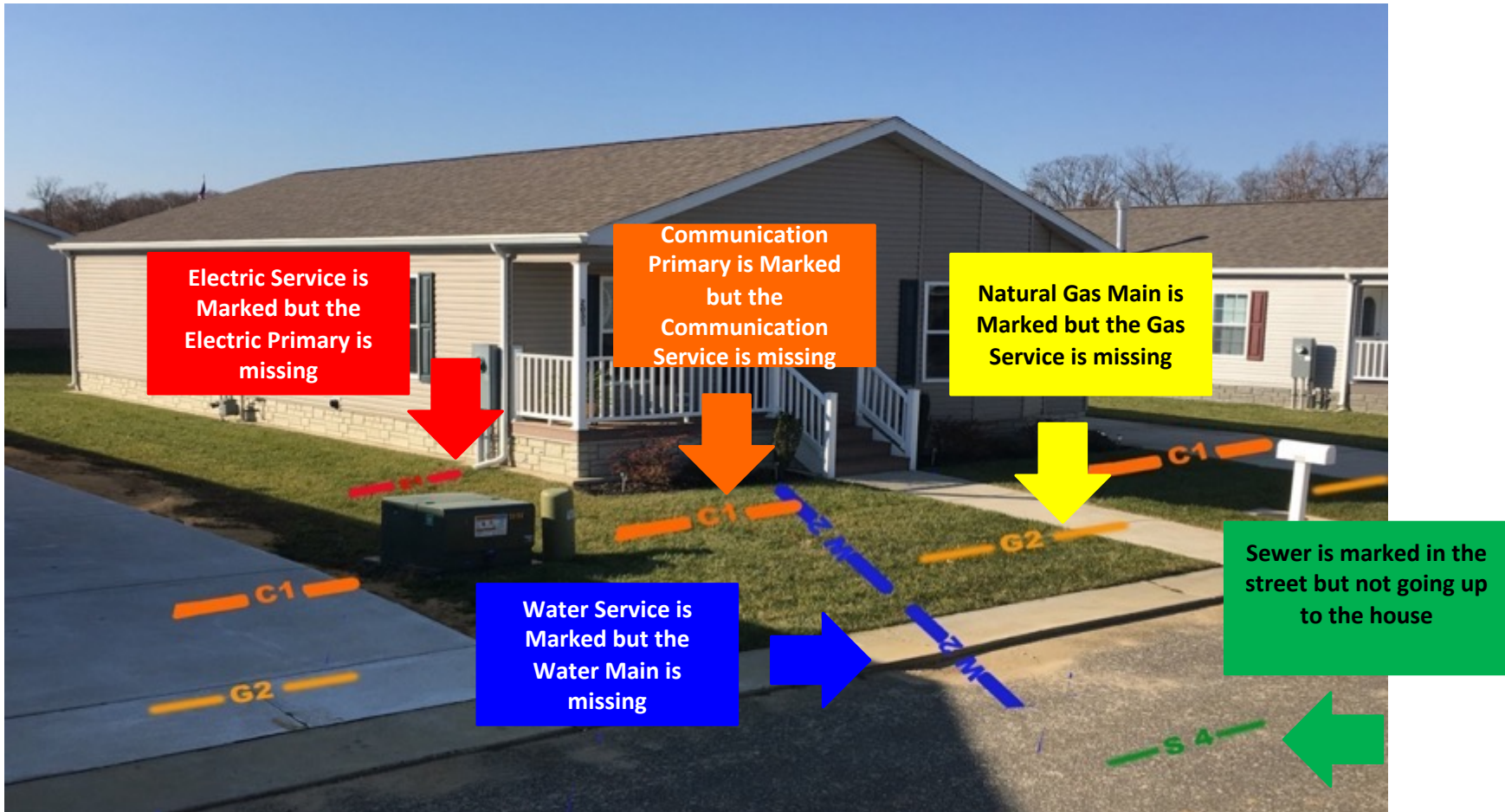
What's Missing?

Ticket for curb to curb and curb to entire property



What's Missing?

Ticket for curb to curb and curb to entire property



Markout Diagrams

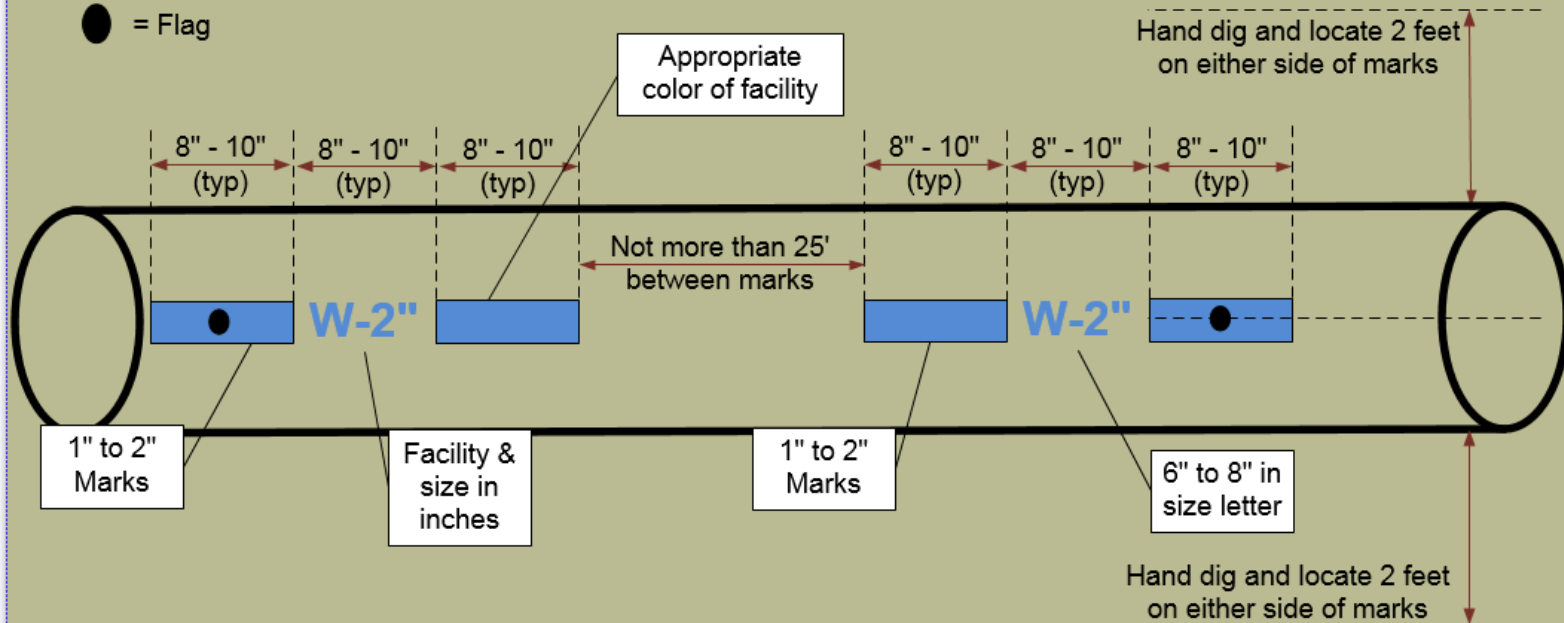
Painted Marking

Centerline Markout for 12" and Smaller

Legend:

□ = Stake

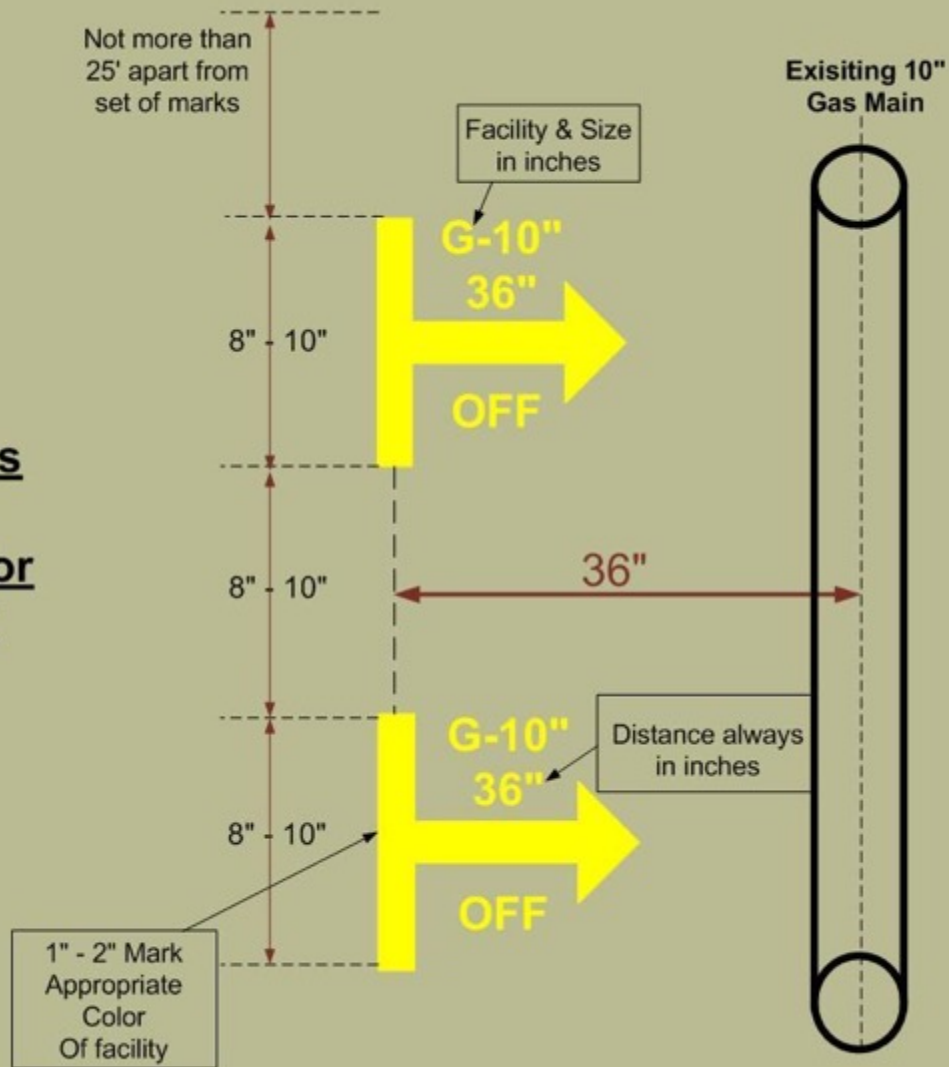
● = Flag



Note: Flags and paint must be used for Non-firm Surfaces.

Markout Diagrams

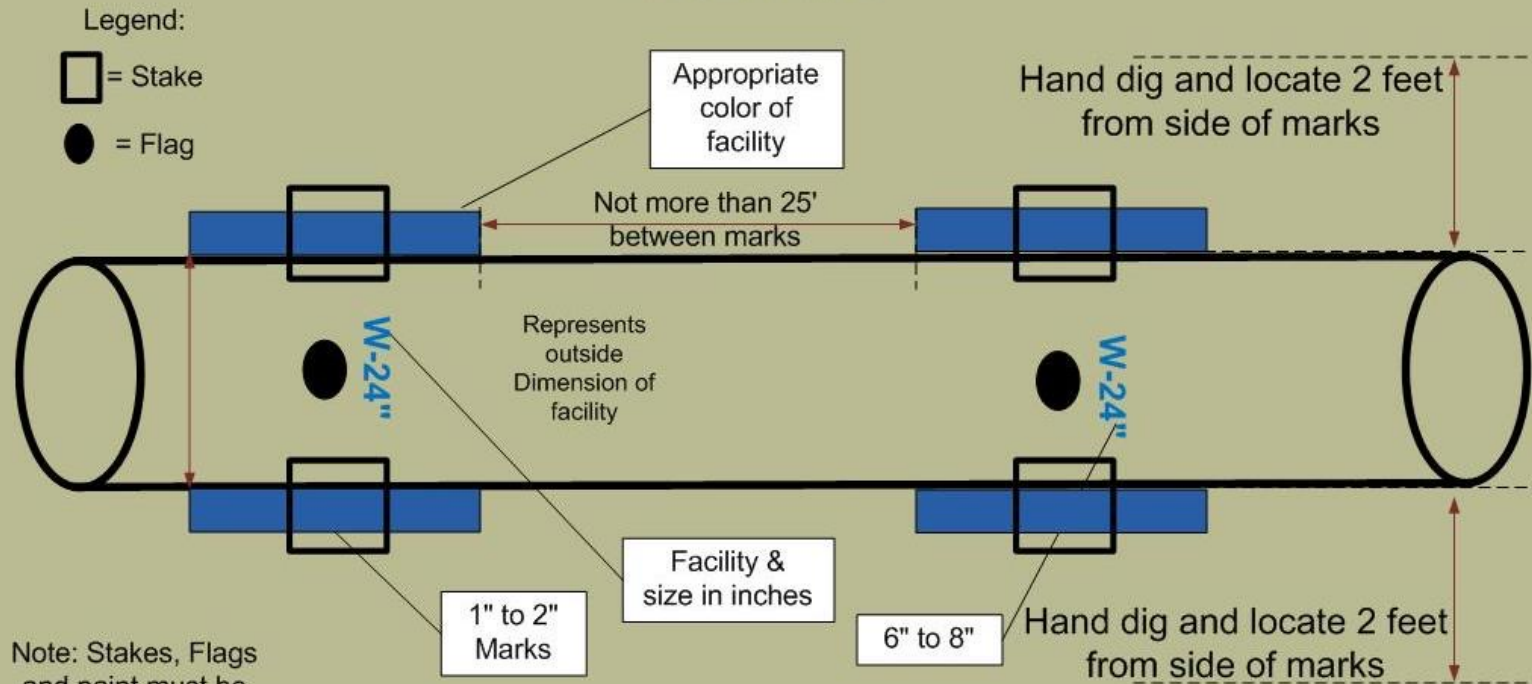
Offset Markouts for 12" and Smaller



Markout Diagrams

Outside Dimension Markout for

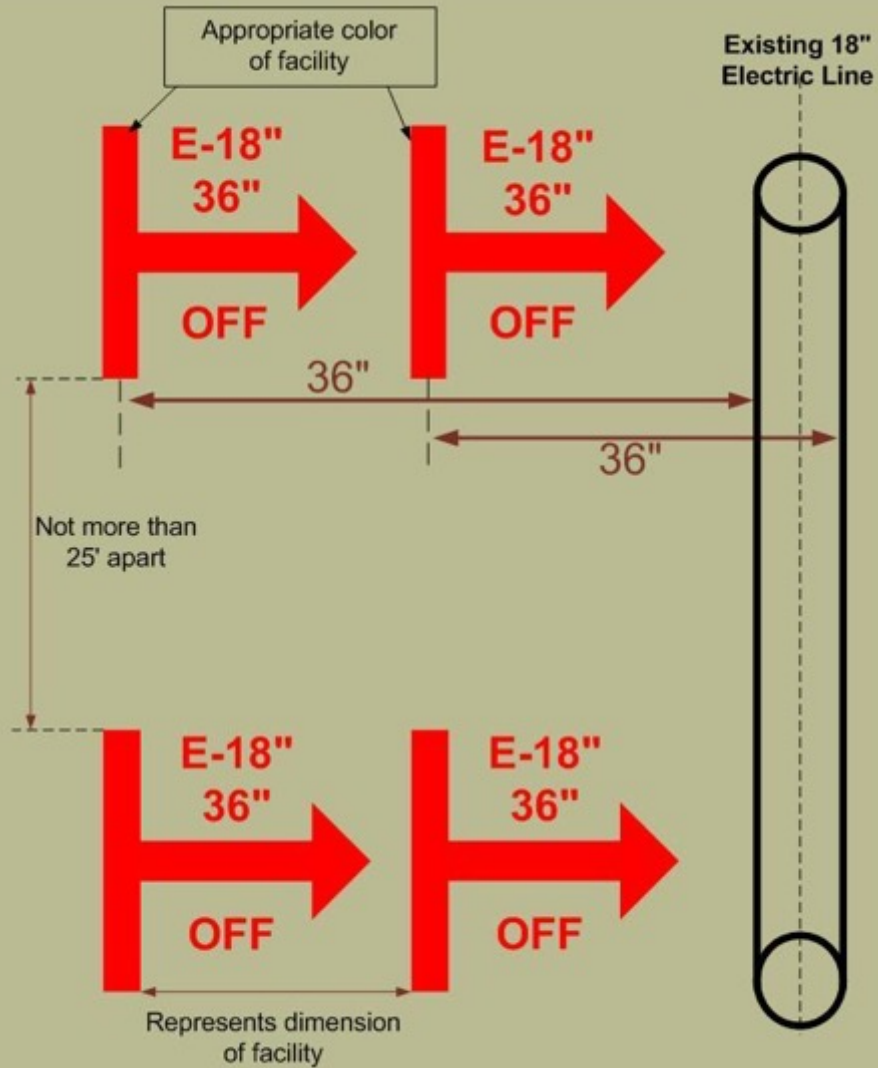
Greater than 12"



Note: Stakes, Flags and paint must be used for Non-firm Surfaces.

Markout Diagrams

**Offset Markouts for
Greater than 12"**



**Table B
Infrastructure Material**

ABS	Acrylonitrile - Butadiene - Styrene
ACP	Asbestos Cement Pipe
CI	Cast Iron
CMC	Cement Mortar Coated
CML	Cement Mortar Lined
CMP	Corrugated Metal Pipe
CPP	Corrugated Plastic Pipe
CU	Copper
CWD	Creosote Wood Duct
HDPE	High Density Polyethylene
MTD	Multiple Tile Duct
PLA	Plastic (conduit or pipe)
RCB	Reinforced Concrete Box
RCP	Reinforced Concrete Pipe
RF	Reinforced Fiberglass
SCCP	Steel Cylinder Concrete Pipe
STL	Steel
VCP	Virtrified Clay Pipe











Transmission Line Markers



Damage to a High Pressure Gas Main

On June 7, 2010, at 2:40 p.m., a **truck-mounted power auger** operated by C&H Power Line Construction (C&H) **struck and punctured a 36-inch-diameter natural gas transmission pipeline** operated by Enterprise Products Operating, LLC (Enterprise). C&H, a contractor working for Brazos Electric (Brazos), was using the auger truck to dig holes for the installation of new electric service utility poles. The natural gas ignited and **killed the auger operator and burned six workers**, who were transported to a nearby hospital for treatment. The pipeline had a maximum allowable operating pressure (MAOP) of 1,051 pounds per square inch, gauge (psig) and was operating at 950 psig at the time of the accident. **Total property damage and clean-up costs were estimated to be \$1,029,000.**



Excavator Responsibilities to Ensure Public Safety

Take the following actions:

- Hand dig within two feet of the marks to locate facilities
- With open trench and during backfilling operations, facilities must be supported and protected from damage
- Immediately report damages to natural gas, liquid petroleum or any hazardous liquid facilities to 911
- In addition, all damages to facilities must be reported to facility operator and/or NJ1Call 811

CALL 911!

It's the Law!

If a Homeowner or Excavator causes or discovers any damage to pipes carrying natural gas, liquid petroleum or any hazardous liquid:

1. Call 911 and
2. Report damage to underground facility operator
3. Call 811 or 1-800-272-1000 the NJ One Call Center.

N.J.A.C. 14:2-3.6

Underground Facilities: One Call Damage Prevention System

Underground facility operator, responsibilities; underground facility markings

N.J.A.C. 14:2-4.4 G

Each operator of an underground facility that handles natural gas or hazardous liquids shall submit a “hits report” listing any damage, emergency or One Call incident involving the operator’s natural gas or hazardous liquids facilities. The report shall be submitted to the Board by the close of business on Tuesday of the week following any two-week period in which any such damage, emergency or One Call incident has occurred.

Supporting Facilities

- Facilities that are exposed or in the dig area must be supported and protected
- Shoring or shielding to keep soil from caving in or collapsing should be used to protect the facilities
- Good backfill practices and proper compaction are required to ensure underground facilities are not damaged as soil settles.
- If underground facilities are undermined during excavation, soil above the facilities should be removed to reduce the weight on the facility.
- At all times throughout the course of an excavation or demolition, an excavator shall also provide adequate physical support of all underground facilities on the site.



Hand Digging

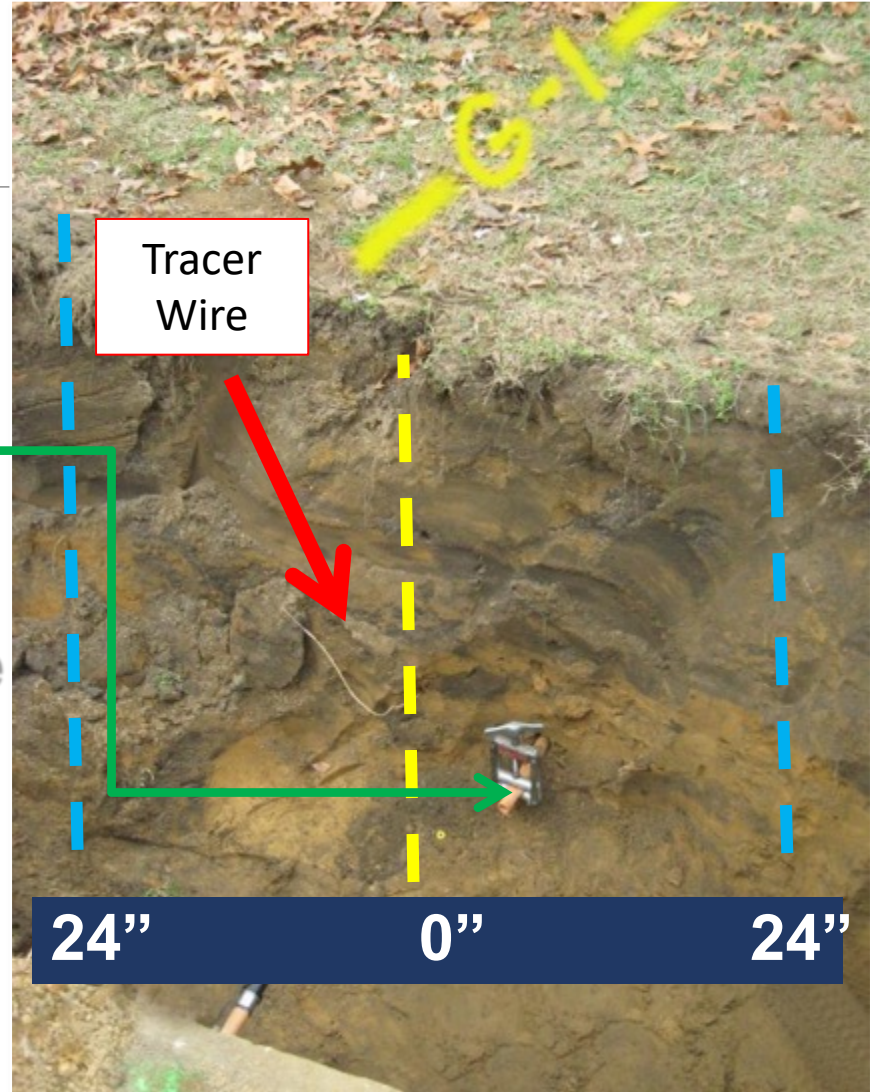
Excavators must hand dig and locate facilities within 24 inches of marks before operation of any mechanized equipment



Reason for Hand Digging

Gas line

- — Markout paint = 0"
- — Hand dig with care area = 24" each side of the outer wall of the facility



Hand Dig and Locate Within 2 Feet

Markouts are not just for backhoes. They are also needed when driving augers, pegs or stakes.



QUIZ!

- True or False: Facilities only need to be supported in the beginning of an excavation?
 - False! Facilities must be supported and protected from damage throughout the course of the excavation

- True or False: Once a gas facility has been damaged, the excavator must notify the facility operator first.
 - False! The excavator's first call must be to 911.

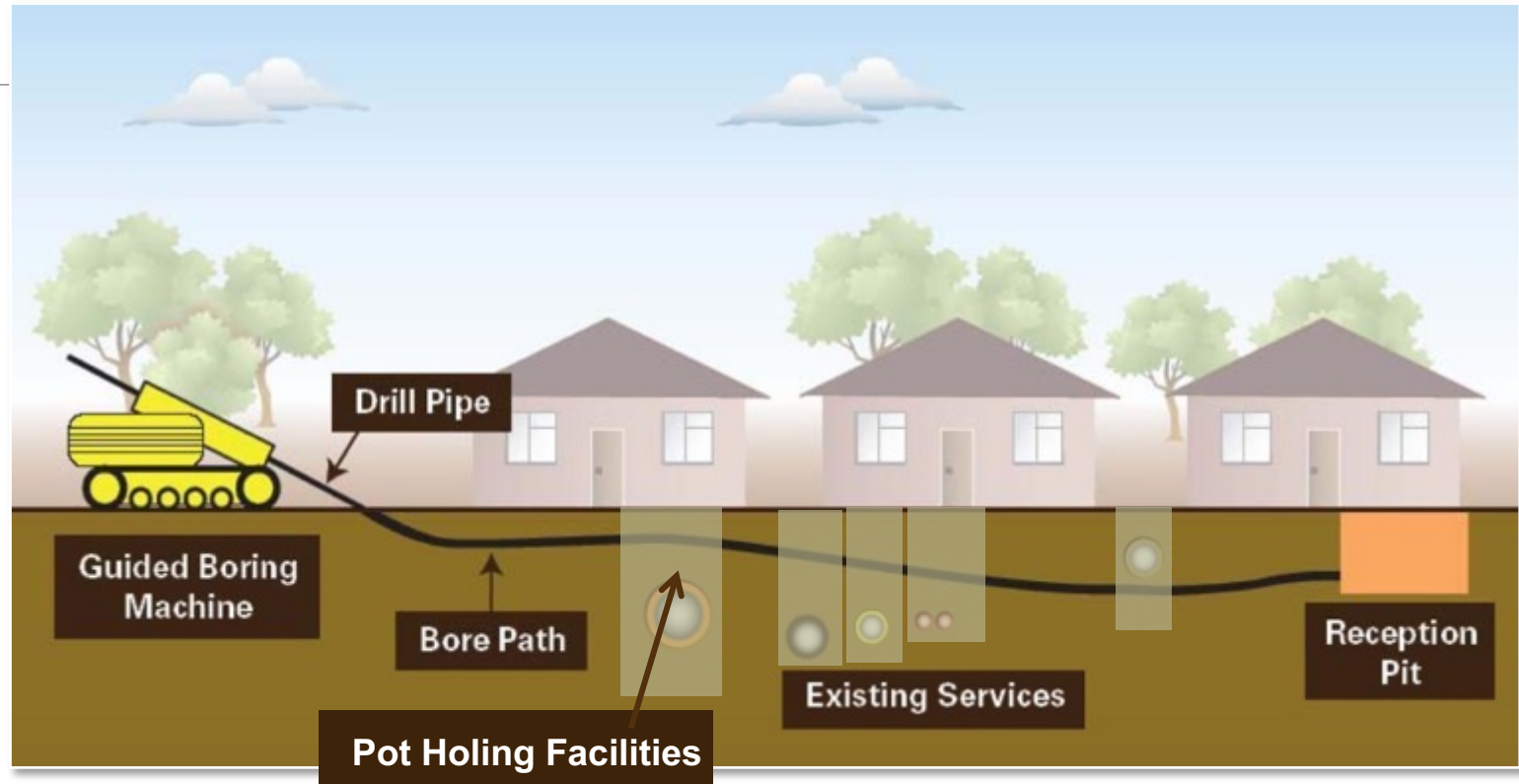
- True or False: It is a suggestion to hand dig and locate facilities within 24 inches of marks before operation of any mechanized equipment
 - False! It is the law.

Trenchless Technology

- Dig Test Holes and verify facility locations when using trenchless technology (drills, pneumatic moles, etc.)
- Utilities which are being crossed must be exposed during drilling and pullback operations
- When drilling parallel to a facility, test holes should be made every 25 feet or so to verify location



Trenchless Technology



What is a Cross Bore?

- The unintended installation of a utility line by trenchless construction methods which damages an existing utility.
- These unintended pipe intersections might go undetected for YEARS without causing a problem.



Drill



Mole



Gas Pipe Bored Through a Sewer

- Can go undetected for decades
- Resulting blockages can be easily mistaken for roots
- Gas cross bore breach can quickly fill a house with gas (minutes)



Blockage



Common Fix



Possible Result

Gas Pipe Bored Through a Sewer

September 2015, Waxahachie, Texas



What if You Suspect a Gas Leak

**Remember the three important signs to identify a potential gas leak -
Look, Listen & Smell:**

- **LOOK** – for dirt blowing into the air, persistent bubbling in standing water or discolored or dead vegetation around the pipeline area.
- **LISTEN** – for any unusual hissing or roaring sound.
- **SMELL** – an odor that smells like rotten eggs. It's important to note that we should not rely on our sense of smell alone to detect a leak. Odorant fade, or loss of odorant, can occur in natural gas piping.

What to Do if You Smell Gas

- Immediately Call 911 and the local gas company

- Stop work and evacuate the area
- Safely shut down equipment within the immediate area
- Do not create a spark or ignition source
- If the gas leak is at or near a building foundation, consider evacuating the building
- Do not attempt to extinguish a natural gas fire
- Do not try and fix the damaged facility
- **Do not shut off valves for any reason**

Altered and Damaged Pipe



Properties of Electricity

Current Flow Effect

- A 7.5 Watt lamp operating at 120 volts draws 62.5 milliamp (mA) of current flow
- Milliamp (mA) = 1/1000 Ampere

1 – 5 mA	Tingle
5 – 10 mA	Shock
10 – 50 mA	Painful Shock
OVER 50 mA	Loss of Muscle Control, Loss of Breathing, and Heart Functions, and Possible Fatal Shock

What to Do When Electric Facilities are Exposed or Damaged

- Immediately call the facility operator and NJ1Call, and stop work
- Warn all persons that the ground and any object near the dig area may be energized
- Excavation operator should remain on the mechanized equipment



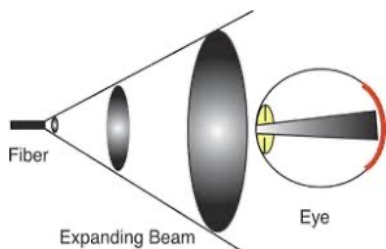
What to Do When Electric Facilities are Exposed or Damaged

- Do not touch the excavating equipment, structures or materials near the point of contact
- Do not resume work or evacuate excavating equipment until the facility operator has deemed the area safe
- If immediate evacuation from the excavating equipment is required – jump, do not step, clear of the equipment and land on both feet
- Move a safe distance away (+25 feet) using short hops or shuffling steps- do not take normal walking steps



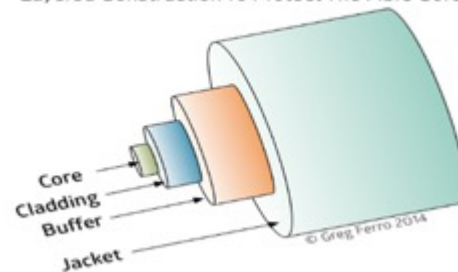
What to Do When Fiber Optic Facilities are Exposed or Damaged

- A beam of infrared laser light travels through a glass fiber at the core of the cable.
- Telecommunications lasers are not strong enough to damage skin or material.



- Lasers can cause damage to the eyes if handled carelessly.
- Infrared lasers aren't visible to the naked eye and do not trigger the natural reflex to blink or to look away.
- **NEVER LOOK DIRECTLY INTO THE FIBER**
- If a fiber is damaged, stop work immediately, secure the site, call 811 and/or the utility owner designated to the ticket.
- Fiber optics damages are expensive to repair

Fibre Optic Cable Construction
Layered Construction To Protect The Fibre Core



What to Do if You Damage Water or Sewer Facilities

- Immediately call the facility operator and NJ One Call
- Stop work and evacuate the area; leaking water can quickly fill and collapse a trench
- Move carefully around trenches with wet walls
- Do not operate or close valves to stop flooding
- Be careful of leaking high pressure water lines
- Sewer gas is flammable; do not create an ignition source
- Avoid contact with sewer wastewater
- Do not try and fix the damaged facility



What to Do if You Damage Communication Facilities

- Immediately call the facility operator and NJ One Call 811
- Stop work immediately and secure the area
- Do not view or stare into broken or severed fiber optic cables
- Do not attempt to handle cables as they may be in contact with a power cable



Utility Damages – Societal Impacts

- Potential loss of life and property damage (public, excavators and first responders)
- Loss of service, potentially to critical facilities
- Evacuation of structures
- Disruption to travel (motor vehicles, buses, trains)
- First Responder (costs and time)
- Construction delays

If You Do Not Call:

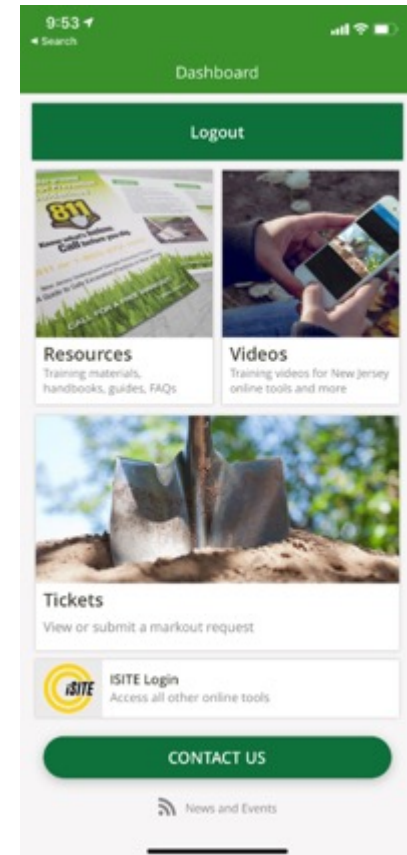
- You do not know what is underground, which places life, health and property at risk
- You are in violation of state and federal law subject to civil and criminal penalties
- You will be held **100%** liable for damages and lost revenue to damaged facilities

QUIZ!

- What is the unintended installation of a utility line by trenchless construction methods which damages an existing utility?
 - Answer: A Cross Bore
- What are the three ways you can detect a gas leak?
 - Answer: See, Smell, Hear
- True or False: Sources of ignition are safe in the presence of Sewer Gas?
 - Answer: False! Sewer gas is flammable

NJ ONE CALL APP.

➤ NJ One Call Mobile App –
Now Available!



BE ON THE LOOKOUT FOR MORE!

Contact New Jersey One Call Center

**New Jersey One Call Center
1 Corporate Place South, Suite 150
Piscataway, NJ 08854**

www.nj1-call.org

**Admin Office: 732.394.3000
Admin Fax: 732.394.3007
Markout Toll Free: 811 or 800.272.1000
Email: newjersey@occinc.com**

Questions, Comments or Concerns?



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Links for More Information

Atlantic City Electric	www.atlanticcityelectric.com
Elizabethtown Gas	www.elizabethtowngas.com
Jersey Central Power and Light Corporation	www.firstenergycorp.com
New Jersey Natural Gas	www.njng.com
Public Service Electric and Gas	www.pseg.com
South Jersey Gas	www.southjerseygas.com
United Water New Jersey	www.unitedwater.com
New Jersey One Call Center	www.nj1-call.org
New Jersey Board of Public Utilities	www.bpu.state.nj.us
Common Ground Alliance	www.commongroundalliance.com
New Jersey Common Ground Alliance	www.njcga.com
PHMSA Pipeline Safety Program	www.phmsa.dot.gov
OSHA	www.osha.gov