2022
MIDWEST DAMAGE PREVENTION
TRAINING CONFERENCE

UTILITY DATA COLLECTION MATTERS

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AUDIOVISUAL SERVICES
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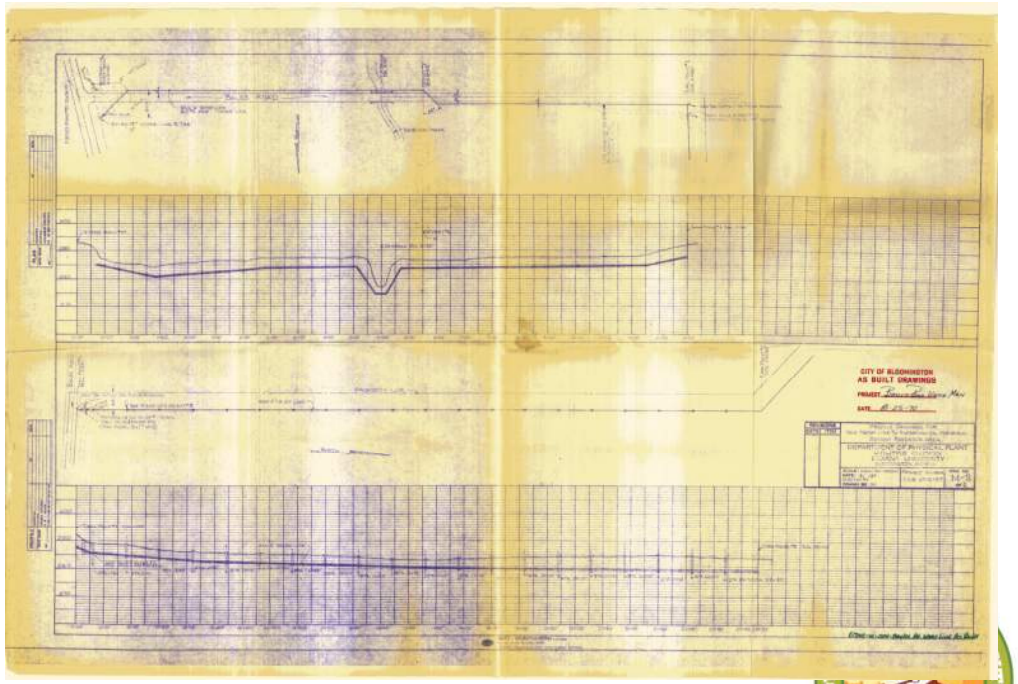
The Problem With Underground Utility Infrastructure:

- What are the most common causes of damages?
- How much does it costs per year to repair damages?
- What can be done to reduce the occurrence of damages?
- What keeps us from implementing measures to reduce damages?

The Problem With Underground Utility Infrastructure:

- Age unknown
- Material unknown
- Size unknown
- Integrity unknown
- **LOCATION** unknown

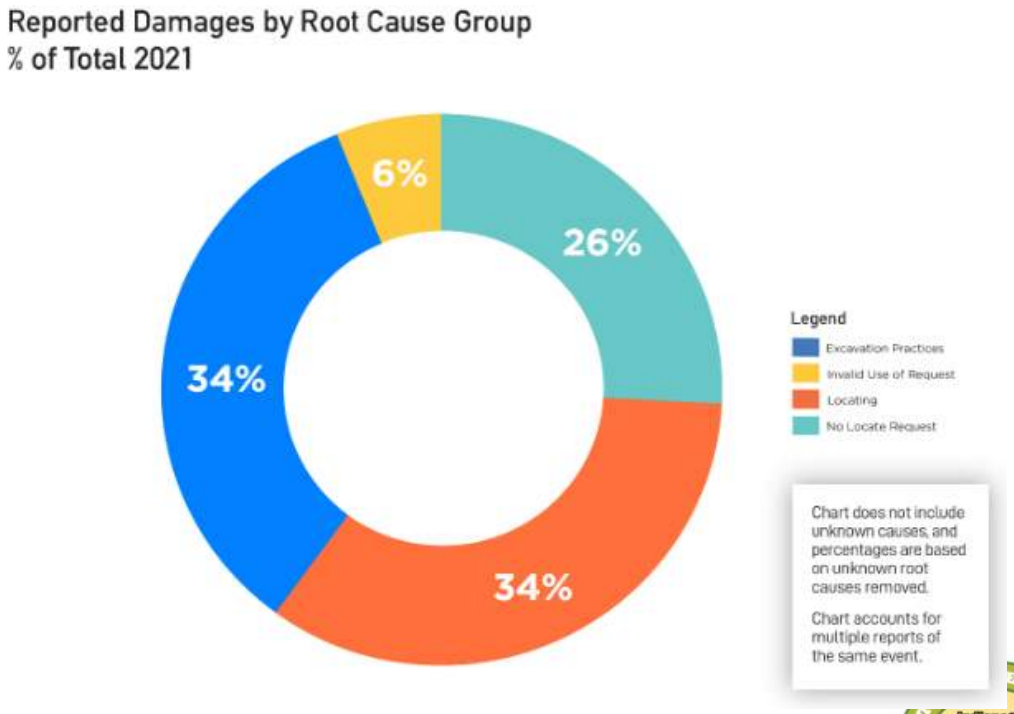


The Problem With Underground Utility Infrastructure:

- Unknowns lead to damages
- Damages lead to loss of time, money, and possibly life
- **Technological advances allow us to do better**

Root Causes of Damages*

- Excavation Practices
- Invalid Use of Request
- Locating
- No Locate Requested



*Data obtained from CGA 2021 Dirt Report found here: [2021 DIRT Report (commongroundalliance.com)]

Excavation Related Damages*

- Failure to maintain clearance
- Improper practices
- Did not pothole
- Failure to shore/support facilities
- Marks not maintained

	Root Cause	Reports	2021 % of Total
1	No notifiction made to 811 center	34,617	25.72%
2	Facility not marked due to locator error	19,341	14.37%
3	Excavator failed to maintain clearance after verifying marks	18,782	13.95%
4	Improper excavation practice not listed elsewhere	12,181	9.05%
5	Marked inaccurately due to locator error	10,763	8.00%
6	Excavator dug prior to verifying marks by potholing	7,090	5.27%
7	Excavator failed to shore excavation/support facilities	3,584	2.66%
8	Marks faded, lost or not maintained	3,449	2.56%
9	Facility not marked due to no response from operator/contract locator	3,138	2.33%
10	Facility marked inaccurately due to incorrect facility record/map	2,764	2.05%
11	Excavator dug prior to valid start date/time	2,704	2.01%
12	Excavator dug after valid ticket expired	2,678	1.99%
13	Facility not marked due to unlocateable facility	2,532	1.88%
14	Facility not marked due to incorrect facility record/map	2,500	1.86%
15	Site marked but incomplete at damage location	1,985	1.47%
16	Excavator dug outside area described on ticket	1,750	1.30%
17	Facility marked inaccurately due to abandoned facility	1,099	0.82%
18	Excavator provided incorrect notification information	961	0.71%
19	Previous damage	662	0.49%
20	Facility not marked due to abandoned facility	548	0.41%
21	Facility marked inaccurately due to tracer wire issue	548	0.41%
22	Facility not marked due to tracer wire issue	294	0.22%
23	Deteriorated facility	282	0.21%
24	811 center error	207	0.15%
25	Improper backfilling	151	0.11%
	Total	134,612	100.00%

*Data obtained from CGA 2021 Dirt Report found here: [2021 DIRT Report (commongroundalliance.com)]

Locating Practices Account for 34% of Damages*

- Facility not marked and/or marked inaccurately due to locator error
- Facility not marked due to no response
- Facility marked and/or not marked inaccurately due to incorrect facility record/map
- Unlocateable facility and/or tracer wire issues
- Abandoned facilities

*Data obtained from CGA 2021 Dirt Report found here: [2021 DIRT Report (commongroundalliance.com)]

Reduce The Risk

- Utility Coordination During Design
- Use of ASCE 38-22
- Use of ASCE 38-75
- Use of SUE for Municipalities
- Adopting practices to record existing utility information
- Adopting practices to record as-built utility information for new facilities

Reduce The Risk

SUE-ASCE 38 Required

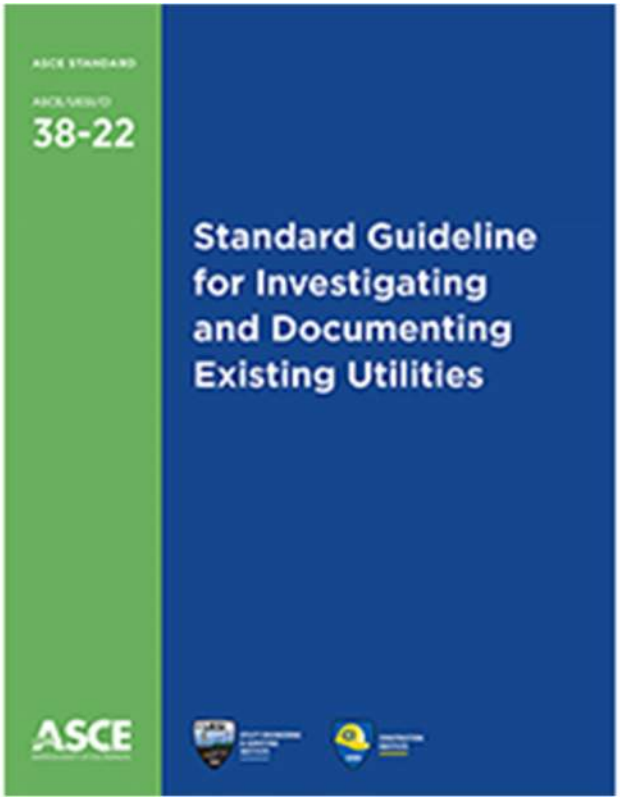
Construction Management ASCE 75

Planning Phase	0-30% Design Phase QL-B - 10% design goal	30-90% Design Phase	90-100% Design Phase	Construction Phase
Design Scoping SUE Requirements Planning Estimate and Procurement	Engineering Design QL B,C & D Avoid Accommodate Relocate	Engineering Design QL A & Conflict Matrix Agreements	Final Engineering Design Utilities early relocation	Construction – CM and As-built Survey

**Used with permission from CDOT

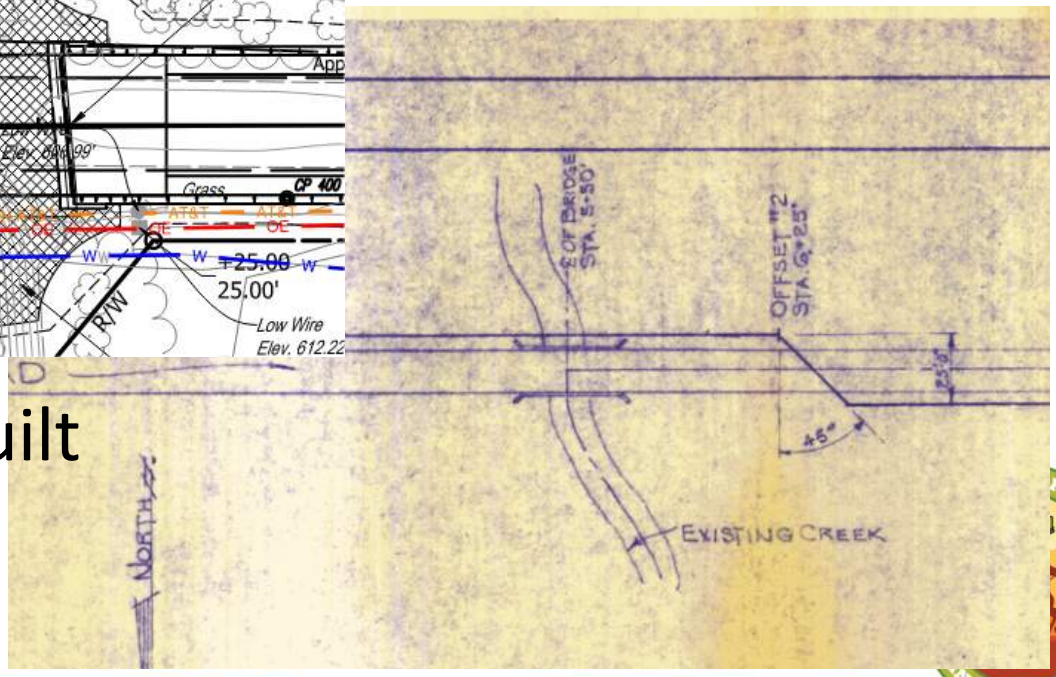
Reduce The Risk

- ASCE 38-22
  - Updated 38-02
  - Same QL's
  - QL-B – Designating
  - QL-A – Locating
  - New Survey requirements for C, B, and A
  - Anchor Points
  - Added above ground appurtenances
  - Deliverables



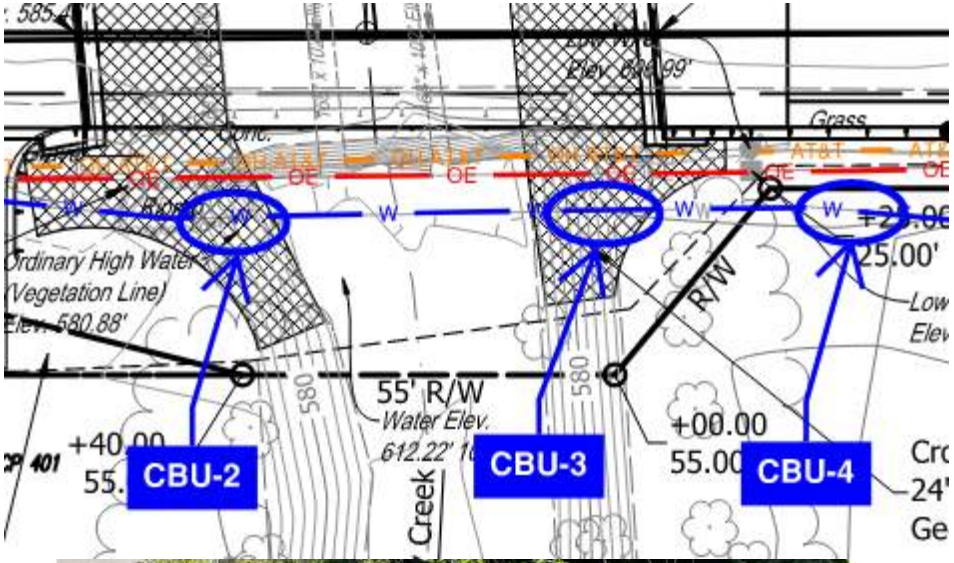
Reduce The Risk

- Before QL-A Locating & QL-B Designating



- Marked Lines mimic as-built drawings

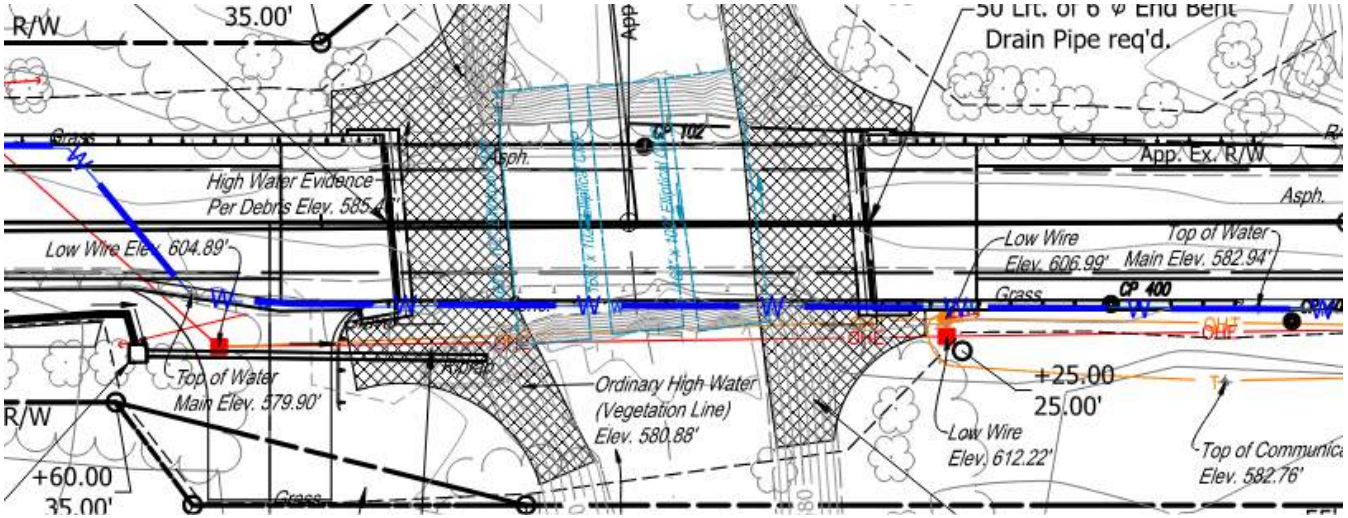
Reduce The Risk



The water line was mismarked – we know now where it actually is and can avoid a significant delay and potential damage to their facilities.

Reduce The Risk

- After QL-A and QL-B



- Water line determined to be in direct conflict with proposed bridge replacement

Current Situation

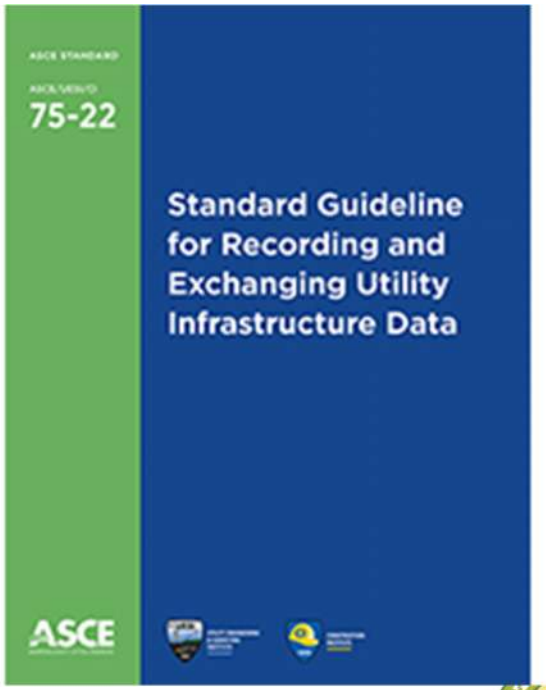
- Limited to no requirements for utilities to provide as-built maps or drawings of new and/or relocated facilities
- Limited to no inspections of utility facility installations
- Limited to no tracking and/or mapping of other utility facilities exposed during installations
- Limited to no tracking of abandoned and/or retired facilities

As-Built New & Relocated Facilities

- As-planned and As-built are **NOT** the same thing
- Providing **ACCURATE** as-built data means knowing where everything **IS**, not just where everything is **SUPPOSED TO GO**
- Merging accurate mapping of **RELOCATED** facilities with one-call locates reduces the number of inaccurate locates during construction

Mapping Existing & New Facilities

- Use of ASCE 38-75
- Commonly referred to as the “As-Built Standard”



Mapping Existing Facilities

- Utility companies starting to see the importance of knowing where their facilities are located.
- Using known designating measures
- Wholesale mapping, not just for a single project
- Technology exists to enable Contractors, utilities, municipalities, to not only map facilities for a specific project but also for wholesale mapping

Mapping Existing Facilities

- Xcel Energy awarded Landmark EPC a contract to map all of their existing mains and service lines
- https://www.reporterherald.com/2022/08/23/landmark-wins-contract-to-map-gas-distribution-services/

Landmark EPC Awarded Major Contract to Map Gas Distribution Services Using ProStar's Technology

"Landmark is thrilled to have been awarded a contract of this magnitude," stated CJ Rigdon, President of Landmark EPC. "Landmark was selected because of the professional services we offer and comprehensive understanding of ProStar's mapping technology, that combined allows us to more quickly and efficiently capture precision location data of main and service lines for one the Nation's largest natural gas providers."

Mapping Existing Facilities

- Advantages:
  - Utilities – minimize number of locate requests when **ACCURATE** mapping of their existing facilities is readily available
  - Contractors – minimizes the occurrences of inaccurate locates by **MERGING** accurate mapping with one-call locates

Mapping Existing Facilities

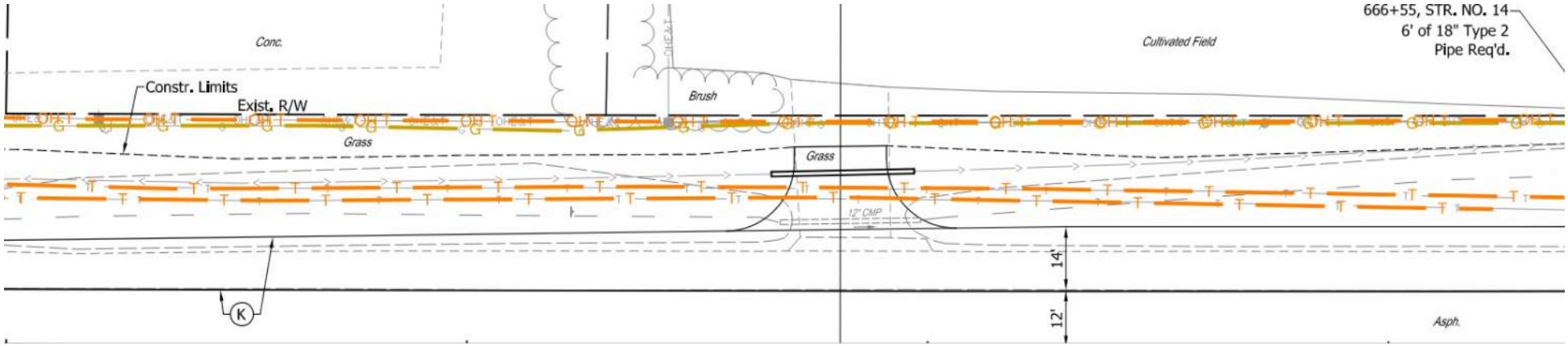
- Advantages:
  - Designers – maximizes the ability to avoid or minimize impacts to facilities when accurate utility data is available **BEFORE** design begins
  - Project Owners – enables DOT's, Counties, Municipalities to **CONTROL** their own right-of-way by knowing the utility assets in their rights-of-way

When Everything Goes Wrong…

- Utility asked to confirm facilities shown accurately – confirmed via written and signed work plan
- Permits all stated the facilities would be placed close to the right-of-way line
- Multiple communication lines installed at different times
- ***Contractor thought some marked lines were inactive***
- Reality proved to be very different

When Everything Goes Wrong…

- As shown on the plans:



When Everything Goes Wrong…

- Work Plan Information

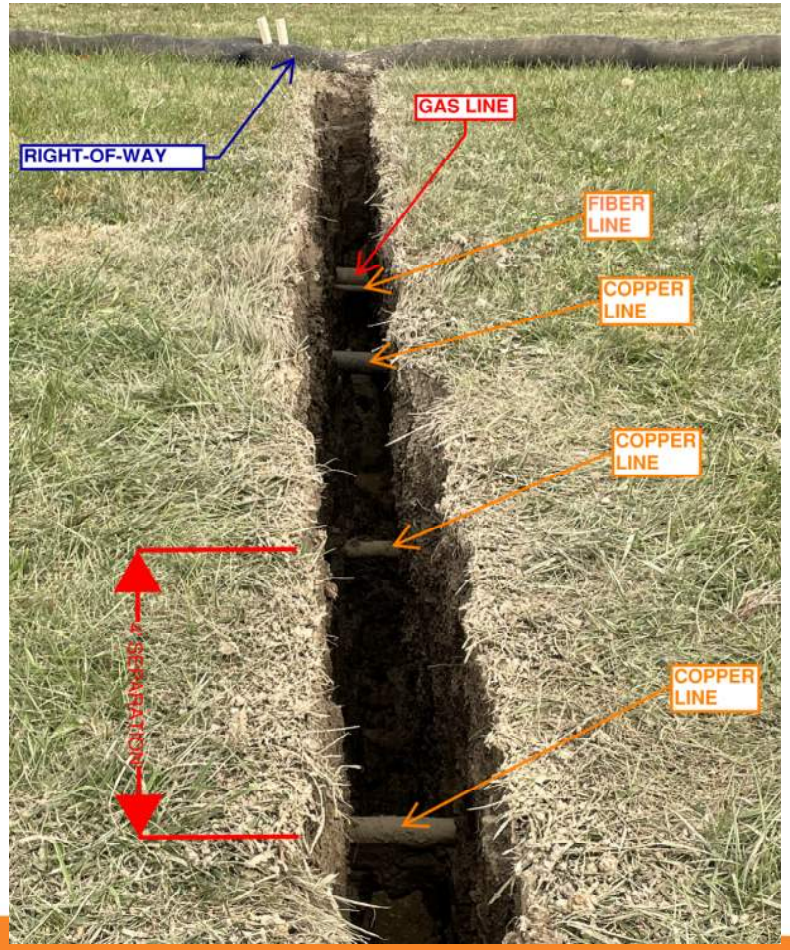
Section 2: A narrative description of the facility relocation that will be required. [IAC 13-3-3(c)]

A. Describe what types of existing active and inactive facilities are present.
Active facilities include: Copper Cable, Fiber Optic Cable, Poles, Pedestals, and Manhole.
No Inactive facilities are present.

B. Describe the location of existing active and inactive facilities.
Frontiers facilities are noted on the STG2 drawings and appear accurate according to Frontier records.

C. Describe what will be done with existing active and inactive facilities.
Frontier facilities to remain in place.

When Everything Goes Wrong…



Implementing Data Collection

- Example project - CDOT Corridor projects**
  - I-70 through Downtown Denver
    - Utilized as-built mapping throughout the project
    - Merged as-built data with legacy data during construction
  - Similar project in scope & size
    - Utilized only legacy data
- Utility Damages During Construction
  - Legacy Data Only – 147 strikes
  - Merging of as-built data & Legacy data – 3 strikes

**Background provided by and used with permission from CDOT

Moving Forward

- Establish processes to allow more accountability for the entire life cycle of a project
- Require SUE, certified by a PE or PLS, for all horizontal projects as part of the design process and included in design plans (per ASCE 38)
- Require as-built mapping of new installations using a standard data collection tool
- Require data collection of all utilities encountered during facility installations

Data Security & Integrity

- UESI URMD - Utility Infrastructure Data Exchange and Security Committee
- Working with Federal Agencies to help develop guidelines:
  - Cybersecurity & Infrastructure Security Agency (CISA)
  - US Department of Homeland Security (DHS)
  - Transportation Security Administration (TSA)
- Open Geospatial Consortium – Model for Underground Data Definition and Integration (MUDDI)

Data Security & Integrity

- Committee Goals
  - Define standardized contract template language for implementing ASCE 75 into the construction effort
  - Outline an overall data management process
  - Outline how data can flow back to utilities to improve their data and facilitate damage prevention
  - Outline process for IT adoption of industry standards for securing data
  - Increase utility industry stakeholder participation

QUESTIONS

THANK YOU

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