THE Event For The Utility Infrastructure Industry
Underground Construction Technology International Conference & Exhibition

Track 1C
(11:00 AM to 11:25 AM)

Interceptor Design Challenges Working Around Buried Utilities

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rjngroup
The Choice for Collection System Solutions

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Question for the day…..

With all the technology and electronic information at our disposal today…

Is successfully executing utility design projects easier or more challenging now?

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Source of Design Error

Poor communication, poor documentation, scope changes, last minute design changes, and Errors & Omissions often contribute more to increased project costs far and above any other root cause of rework.

What are Errors & Omissions?

In the field of civil engineering, Errors & Omissions include claims against the engineer for inadequate design or negligence.

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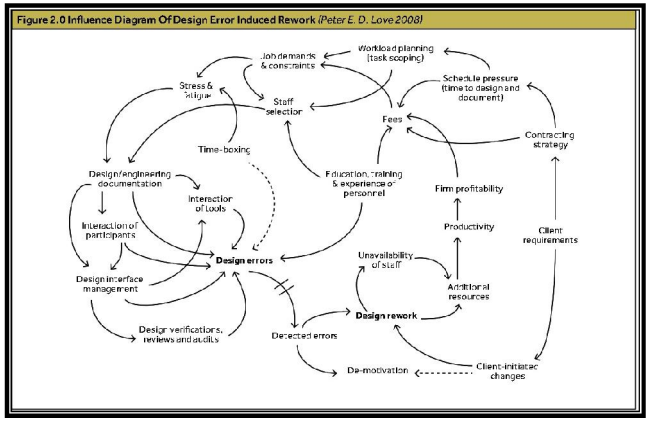
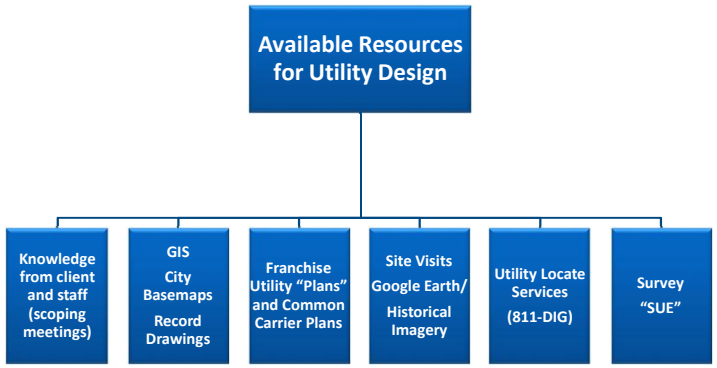
What causes Design Errors?





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Subsurface Utility Engineering (SUE) Utility Mapping Quality

(CI/ASCE 38-02)

LEVELS

A
- Precise horizontal and vertical location
- Obtained by physical exposure of utility

B
- Horizontal location obtained by geophysical location technologies

C
- Survey of visible above-ground utility features
- Engineering judgement and Level D SUE

D
- As-built plans, record drawings or other general knowledge of utilities in the area

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Reliability of Utility Mapping

Municipal Utilities

- Municipal utilities are owned and operated by the city (water, sewer, storm)
- With good record keeping most city utility records can be found through the city through utility base maps (GIS) and record drawing files.
  - Problem Areas:
    - Historically limited information on storm sewers
    - Age of record drawings

Franchise Utilities

- Franchise utilities include electric, telephone, fiber optic cable, cable television, natural gas pipelines, and ductwork.
- These utilities are "permitted" for placement within the public right-of-way (ROW), but record drawings are often not readily available

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Reliability of Utility Mapping - Continued

Horizontal Directional Drilling

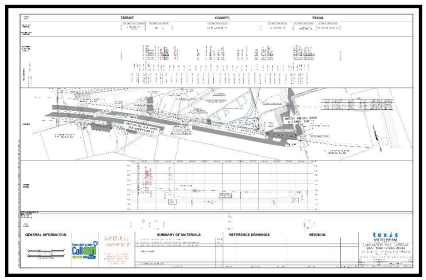
- What is Horizontal Directional Drilling?
  Horizontal Direction Drilling (HDD) is a steerable trenchless method of installing underground pipe, conduit, or cable in a shallow arc along a prescribed bore path by using a surface-launched drilling rig, with minimal impact on the surrounding area.

- HDD began in 1970, but actively entered the Engineer's vernacular in the 1980s primarily due to massive Fiber Optic Cable (FOC) installations. The influence and implication of HDD is wide spread due to increased use for franchise utilities, especially natural gas mains. <u>But, where are the bore logs/profiles for franchised FOC and gas mains?</u>

Reliability of Utility Mapping - Continued

Common Carrier Utilities

- Common carriers are regulated by the federal, state, and local governments, but typically facilities are not built within the public ROW.
- Although construction plans are required to be produced and shared with local governments for planning purposes, typically once permitted record drawings (HDD bore logs) typically must be obtained from the owner of the common carrier utility.



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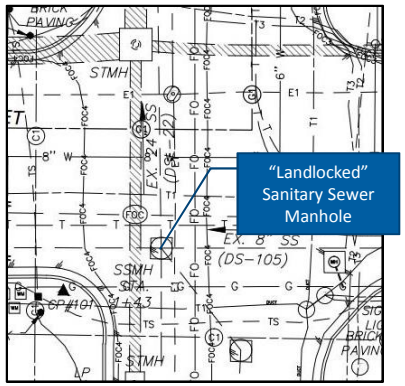
It's getting crowded in here…



- Underground real-estate is becoming increasingly crowded (Urbanization).
- Utility congestion causes design challenges for utility rehabilitation design and new utility pipeline designs (interceptor re-routes or capacity improvements).
- Constructability often drives the design decisions (eg: method of construction selected for existing site conditions).

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Keys to a Successful Pipeline Design: Mitigating Risks

- Continually evaluate and refine your design process
- Check record drawing information against survey - don't be afraid to resurvey conflict areas as needed
- Hold your design schedule
- Be persistent to obtain records from all franchise utilities and common carrier utilities as early as possible in the design phase
- Obtain HDD bore logs when available
- Gas lines: when in doubt plan for Level "A" SUE

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Keys to a Successful Pipeline Design: Mitigating Risks

- Walk the project site, walk it again
- Develop a thorough, independent, and proactive QA/QC review process (it must include source information validation)
- Understand the limitations of your internal design staff
- Understand the limitations of your external design team
- **Don't Assume - Communicate Early and Often**