Trenchless Best Practices for Damage Prevention

PrePlan
- Existing underground structures, utilities and facilities expected in the area should be determined, including privately owned sewer lines and French drains
- Other information, such as right-of-way and geological information should be obtained and reviewed
- The following should be determined and considered when creating the bore plan:
  - Requirements for clearance, vertical and horizontal, of underground structures, utilities and facilities
  - Size of pullback tools
  - Bend radius of pipe and product
  - Ability to track the bore
  - Ability to expose existing utilities and observe crossings
  - Surface structures for drill placement and setback requirements
- An emergency response plan should be created and communicated to entire crew in the case of an underground strike
  - Plan should include:
    - contacts with phone numbers
    - procedures for each type of event
    - assignments of responsibilities
- Communication method between operator and tracker must be provided
- Traffic and pedestrian control must be planned
- Required construction permits must be obtained
- Planned installation should be mapped, either through a software program or hand written

Locate utilities
- Proposed excavation and bore path must be marked with white paint or flags
- One-call (811) must be contacted to coordinate utility locates with member companies
- All utilities that do not participate in one-call must be contacted
- Locates must be verified
  - Personal locator
  - Visual inspection for any utilities that may have been missed
    - sunken areas indicating previous excavation
    - risers
    - outbuildings with utilities
    - light poles
    - meters
  - Utilities must be exposed by hand digging or vacuum excavation, if:
    - within 18-24 inches (depending on local regulations) of the bore path, exit/entrance pits or anchoring position
    - at the point of crossing – depths are not consistent from one location to another
- Confirmation that locates have been completed should be obtained
• Photo of locates should be taken
• If locates are damaged, unclear, obscured, covered by snow, etc. they must be repeated.
• Locator must be contacted if there are any questions about the marks. Assumptions must not be made.
• All nearby sewer lines should be located either by GPR or with a beacon and locator.

Prepare
• Ensure extra batteries are available for tracking equipment and communication devices
• New batteries must be installed in the beacon at the start of every shift
• Replace batteries in tracker when indicated on display
• Beacon and tracker must be calibrated at the start of every shift
• Frequency for tracking must be determined for the jobsite
• Replace batteries in communication devices for operator and tracker as needed
• Electric strike system must be set up and tested at the beginning of each shift
• Setup location must be determined considering the following:
  o Ability to drive anchors
  o Depth needed
  o Setback distance needed
  o Nearby utilities
    • near anchors
    • directly in front of drill

Crew protection
• If there is any chance of drilling within 10 feet of a buried electric line
  o Drill operator should wear electrically insulated boots and have electrically insulated gloves within reach
  o Tracker should wear electrically insulated boots with pants tucked into tops of boots
• Everyone must be briefed on the electrical strike system and procedures
  o No one should touch the drill while it is drilling
• Manual pipe loading must be done only after drilling has stopped
  o A ground mat is recommended if a second person is helping load/unload pipe ground mat
• Anchors must be driven from the operator's platform
• Anchors must be driven to full depth for grounding or a ground rod should be used
• Tracker should step away from bore path while drill head is moving and track drill head only after it has stopped.

Drilling/Tracking
• Drill head must not enter the tolerance zone of other installed utilities
  o Backreamer size must be considered when determining appropriate pilot bore location
• Drill head must ALWAYS be tracked during pilot bore every 1/2 to full length of installed drill rod
  o Drilling must be stopped anytime the ability to track is lost or hampered
  o Each tracking location should be marked and the depth recorded
  o Tracker should periodically review marks to ensure planned bore path is being followed
• Drilling depth must be carefully planned. (Drilling below 10’ requires special precautions.)
• When crossing a utility during pilot bore and backream, the crossing must be visually observed, even if under pavement. If visual observation is not possible, another bore path should be taken.
• Drill head should always be rotated unless steering
• When drilling parallel to existing utility, the following guidelines should be used:

<table>
<thead>
<tr>
<th>If drilling parallel within...</th>
<th>Utility must be exposed</th>
<th>Drill head must be tracked</th>
</tr>
</thead>
<tbody>
<tr>
<td>3’ of existing utility</td>
<td>every 50’</td>
<td>every 5’</td>
</tr>
<tr>
<td>5’ of existing utility</td>
<td>every 200’</td>
<td>every 10’</td>
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</tbody>
</table>

• An as-built map should be created
• A camera inspection of sewer lines in the area must be conducted after the work is complete.

**Emergency response**

• Reference horizontal directional drill operator’s manual
• In case of an electric strike
  o Anyone on equipment must remain on equipment
  o Anyone off equipment must remain in place and not touch equipment
  o Operator should pull back drill string to attempt to break contact
  o Strike system should be used after one full minute to re-check for a strike
  o Electric company should be contacted as soon as possible

• In case of natural gas strike
  o Machine must be shut down and all sources of ignition extinguished immediately
  o Gas company and 911 must be contacted as soon as possible
  o Everyone in the area should be notified of the strike
  o Evacuation is recommended, especially if the ground is frozen or covered with snow

• In case of fiber optic cable strike
  o Everyone should be kept from looking at the damaged cable to prevent eye damage
  o Cable company should be contacted as soon as possible

**Construction Safety Guidelines**

Prior to performing work involving HDD under a Right-of-Way the operator and crew shall consider the following safety guidelines:

• Perform all operations in compliance with OSHA guidelines and insure that all personnel are properly trained and equipped to work in the public right-of-way;
• Insure that the approved traffic control plan is implemented and followed at all times;
• Insure that all storm water pollution prevention measures are implemented and followed at all times;
• Insure all setbacks, offsets, and clearances are maintained;
• Insure that utility One-Calls and City or other utility coordination requirements have been met
• Positively identify (by potholing) all crossed utilities that are expected to be
  o Above and within 5’ of the proposed vertical alignment,
Below and within 3' of the proposed vertical alignment,
and additionally as requested by the owner of the right of way and/or the owner of the utilities being crossed.

- Positively identify (by potholing) all parallel utilities at the beginning and ending of all bores and
  - Every 200' if it is within 5' of the proposed alignment,
  - Every 50' if it is within 3' of the proposed alignment,
  - and additionally as requested by the owner of the right of way and/or the owner of the utilities in parallel.

- The HDD Operator shall have a planned response in the event of a utility strike including utility owner notification and
  - Avoiding electrocution in the event of an electric strike,
  - Avoiding combustion in the event of a gas line strike,
  - and avoiding contamination in the case of a sewer strike.