HDD Guidelines for Damage Prevention

Pre-plan

- Existing underground structures, utilities and facilities expected in the area should be determined, including privately owned sewer lines
- 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
- Look and plan for conditions that can lead to drilling fluid inadvertent returns, such as:
  - Soil conditions to determine proper mud mix
  - Previous excavation that will be path of least resistance
  - Flow rates
  - Bit size

Locate existing 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

Color Codes for Utilities

<table>
<thead>
<tr>
<th>Color</th>
<th>Utility</th>
</tr>
</thead>
<tbody>
<tr>
<td>Red</td>
<td>Electric</td>
</tr>
<tr>
<td>Orange</td>
<td>Telecommunication</td>
</tr>
<tr>
<td>Yellow</td>
<td>Natural Gas</td>
</tr>
<tr>
<td>Green</td>
<td>Sewer/Waste</td>
</tr>
<tr>
<td>Blue</td>
<td>Drinking Water</td>
</tr>
<tr>
<td>Violet</td>
<td>Reclaimed Water</td>
</tr>
<tr>
<td>Pink</td>
<td>Unidentified Facilities</td>
</tr>
<tr>
<td>White</td>
<td>Proposed Excavation</td>
</tr>
</tbody>
</table>

For more information, email dwsafety@ditchwitch.com or visit ditchwitch.com/safe
- known service lines
- shut-off valves
  - Utilities must be exposed by hand digging or vacuum excavation to the depth of the proposed bore, if:
    - within 18-24 inches (depending on local regulations) of the bore path, exit/entrance pits or anchoring position
    - All crossed utilities that are
      - expected to be within 10’ of the proposed vertical alignment,
      - above and within 5’ of the proposed vertical alignment
      - below and within 3’ of the proposed vertical alignment
      - requested by the owner of the right of way and/or the owner of the utilities being crossed

![Diagram](image)

Figure 1: Illustration of crossed utility exposure guidelines (not to scale)

- Support and protect exposed utilities as needed
- Confirmation that locates have been completed should be obtained
  - Clearance can be obtained from each utility owner
  - Some states have a positive response confirmation
- Photo of locates should be taken prior to job commencement
- 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.
- Some utility companies prefer to have one of their people on site to observe the crossing of their utility
- 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 job. Lithium batteries or a power stick are preferred.
- Replace batteries in tracker when indicated on display
HDD Guidelines for Damage Prevention

- Beacon and tracker must be calibrated at the start of every job
  - Check the jobsite for the presence of any active interference and be mindful of passive interference sources
- 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, prior to anchors being driven
- Setup location must be determined considering the following:
  - Ability to drive anchors
  - Depth needed
  - Setback distance needed
  - 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
  - Drill operator should wear electrically insulated boots and have electrically insulated gloves within reach
  - Tracker should wear electrically insulated boots with pants tucked into tops of boots
- Everyone must be briefed on the electrical strike system and procedures
  - No one should touch the drill while it is drilling
- Manual pipe loading must be done only after drilling has stopped
- Anchors must be driven from the dedicated platform or from a safe distance using the remote control
- 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 and backreamer must not enter the tolerance zone of other installed utilities
  - Backreamer size must be considered when determining appropriate pilot bore location
- Drill head must ALWAYS be tracked during pilot bore every ½ to full length of installed drill rod
  - Drilling must be stopped anytime the ability to track is lost or hampered
  - Each tracking location should be marked and the depth recorded
  - 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.
  
  Note: Know conditions that may affect soil stability around exposed utility and take appropriate precautions.

• Drill head should always be rotated when drilling unless steering

• When drilling parallel to existing utility, the following table provides guidelines for exposing utilities and tracking:

<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>
</tr>
</tbody>
</table>

  
  Note: this may be adjusted depending on the depth of the bore relative to the depth of the utility.

• An as-built map should be created

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 reset 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 After notifying everyone, leave the area.

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

Job completion/inspection

• Use proper backfill to close all pits and utility exposures.

• A camera inspection of sewer lines in the area must be conducted after the work is complete.

NOTE: These guidelines are not meant to replace local regulations. If a local regulation exists that conflicts with these guidelines, the local rules should be followed.