



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

	Red — Electric
	Orange — Telecommunication
	Yellow — Natural Gas
	Green — Sewer/Waste
	Blue — Drinking Water
	Violet — Reclaimed Water
	Pink — Unidentified Facilities
	White — Proposed Excavation

- 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

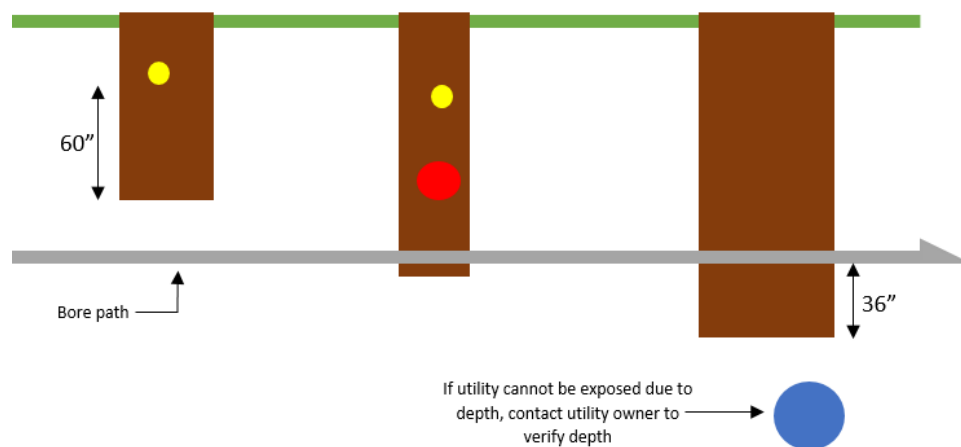


Figure 1: Illustration of crossed utility exposure guidelines (not to scale)

- 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

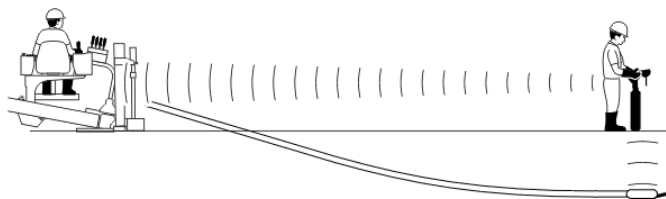
- Beacon and tracker must be calibrated at the start of every job
 - Check the jobsite for the presence of any active interference and be mindful of passive interference sources
- Replace batteries in communication devices for operator and tracker as needed
- Electric strike system must be set up and 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:

If drilling parallel within...	Utility must be exposed	Drill head must be tracked
3' of existing utility	every 50'	every 5'
5' of existing utility	every 200'	every 10'

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
 - Anyone on equipment must remain on equipment
 - Anyone off equipment must remain in place and not touch equipment
 - Operator should pull back drill string to attempt to break contact
 - Strike system should be reset after one full minute to re-check for a strike
 - Electric company should be contacted as soon as possible
- In case of natural gas strike
 - Machine must be shut down and all sources of ignition extinguished immediately
 - Gas company and 911 must be contacted as soon as possible
 - Everyone in the area should be notified of the strike
 - After notifying everyone, leave the area.
- In case of fiber optic cable strike
 - Everyone should be kept from looking at the damaged cable to prevent vision damage
 - 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.