

Applications for New Installations

There are several types of trenchless technology applications for new installations. The following are some of the most prominent applications.

Note that some specifications described in the following content may not be the same as the specifications followed by your agency. Always check with your State agency's standards and specifications when using these guidelines.

Sections

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General Specifications for New Installations

- Site investigation must be completed**
- Materials, equipment, method, and sequence of operations are approved**
- Materials are in accordance with requirements**
- Operations do not interfere with, interrupt, or endanger the roadway surface and activity, including:**
 - Surface
 - Structures
 - Utilities

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- Alternate route for pedestrian use of sidewalk areas has been determined
- Excavation is the minimum necessary to complete the work

Jack and Bore/Auger Bore

- Jacking pit is of sufficient size for operations
 - Excavation method is compatible with expected ground conditions
- Length of bore is the minimum required
- Dewatering may be required
- All excavated material should be removed from the casing pipe as excavation progresses with no accumulation of such material occurring
- Driving ends of the casing pipe should be properly protected against spalling and other damage
- Any section of conduit showing signs of failure should be removed and replaced
- All voids should be grouted immediately after jacking operations have finished
- Extreme care should be exercised to maintain line and grade

Pipe Ramming

- Soils are homogeneous and free of rock, boulders, stumps, and debris
- Steel bands ½-in. thick allowed
 - On the outside of the leading edge of the pipe to reduce friction
 - On the inside of the pipe to compact the spoil and to prevent plugging
- Install at the appropriate minimum depth of cover

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- Spoil is contained with the casing during ramming, removed afterwards using compressed air, and cleaned
- Limit air pressure to less than the rating of the pipe
- Lubricants are used as needed

Moles and Small Rammers

- Launching pits are sufficient length, width, and depth**
 - Depends on the equipment and operation logistics
 - Typically 4–6 ft. long
 - Longer pits installed as series of shorter pits
 - Should be back-sloped and shored for safety
- Correct alignment of tool in insertion pit**
 - After mole is 1/3 in ground, check alignment and correct; repeat until in the ground
- Tool should advance in a straight line**
 - Operator has little control over path once launched
- Operator does all steering according to planned route**
- Evidence of appropriate lubrication of tool visible**
 - Small mist of oil as exhaust air from the tool
 - Type of oil recommended by manufacturer is used
- Boring done in appropriate temperature conditions or mitigation strategies used**
 - Cold temperatures may stop mole through icing
 - Hot temperatures may require more oil for lubrication

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- Product pipe is typically pulled into place after borehole is completed, or:**
 - Pushed into place using special driving heads
 - Simultaneously pulled into place using special pulling accessories

Pipe Jacking

- Dewatering effort is satisfactory**
- Pipe characteristics are consistent with permit requirements.**
- Jacking pipe is certified for jacking**
 - Pipe has a smooth interior and exterior surfaces
 - Used within the entire influence area of the roadbed
 - Clean and square ends
 - Joints are watertight
 - Defective pipe is not used
 - Damaged pipe is jacked through to the receiving access pit and removed
- Jacking head fits square with the pipe**
- Back thrust block is structurally adequate, jacking force is within the range of calculated jacking force, and the jacking force is recalculated whenever the operation is stopped**
- Lubrication fluid is used, and a lubrication system properly injects lubricant on the inside and outside of the pipe**
- Each end of the pipe is enclosed; restoration is completed**

Microtunneling

- Systems are operated following manufacturer's instructions**

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- Copies of operations manuals are available to engineer and operational personnel at all times**
- Tests are run before key activities:**
 - Test full system on completion of set up and before commencing drive
 - Before commencement of any drive, demonstrate to engineer that required set-up procedures and system checks are complete and required materials are at hand to commence drive
- Receiving pit constructed prior to the start of the drive**

Horizontal Directional Drilling (HDD)

- Pipe reamed/pulled according to size of the drilled hole**
 - 6 in. or less – pulling the pipe into hole within 8 hours
 - More than 6 in. – simultaneously pulling pipe or casing into hole as reaming occurs
 - Multi-pass reaming larger than 6 in. requires certification by the contractor's engineer that the soils are self-supporting of the dead and live loads
- Drilled or reamed holes limited to 2 in. larger than the pipe**
- Depth of cover is maintained, as specified**
- Bores are begun at locations that allow transitioning the bore to meet the depth of cover requirements**
- Drilling fluids are used as appropriate for the type of soil, and only used while drilling/reaming**
 - Drilling fluid pumping capacity, pressures, density, composition, and flow rates
- Monitor materials being removed from the trenchless operation**