

Summary of Microtrenching Best Practices

This is a summary of best practices from the MAG microtrenching research study and microtrenching working group. It combines lessons learned from peer agencies with local input to provide guidance and considerations for agencies considering or implementing microtrenching in their local jurisdictions.

Technical Considerations
Trench Width
The microtrench width should be no more than 2.5 inches.
Trench Location
Specify trench location within the street cross section. Locate microtrenching as close to the edge of pavement or gutter line as possible, avoiding wheel paths. In areas where there is no curb, place it at least six inches from the edge of pavement. Behind the curb is also acceptable, but the design details need to account for new driveways. Where there are bike lanes or routes, install microtrenching outside of the wheel path, such as at the lane line. Trenches should be placed to minimize roadway crossings. Ideally, trenches would be along both sides of the road with crossings only at intersections.
Minimum Trench Depth
Specify a minimum trench depth and separation from pavement structure. A microtrench depth with 12 to 16 inches of cover above the top of the conduit is ideal and should not be shallower than 10 inches from the top of the conduit to the pavement surface. Install conduit outside of the pavement for thick pavement sections.
Lateral Trench Separation
Require lateral trench separation. Include at least 12 inches of lateral separation between trenches.
Street Type
Consider which street types to allow microtrenching. Limit microtrenching primarily to residential streets where there are fewer conflicts with other utilities. Microtrenching should be limited to asphalt roads and trenched on both sides to avoid service lines crossing the street.
Local Considerations
Conduit installation and pavement restoration should be based on local considerations. Most cities have pavement cut policies or restoration requirements for pavement cuts that should be considered when evaluating whether microtrenching is a viable option for each local agency. Pavement restoration requirements are temperature/climate dependent. Specify materials in consultation with local pavement engineers. Considerations include: <ol style="list-style-type: none">1. Slurry backfill for all installations.2. Epoxy seal for the first or a single trench in the pavement that is in good condition.3. 18- to 24-inch mill and overlay for poor pavements in poor conditions or multiple trenches.4. If trench is in bike lane, overlay entire lane.5. Moratorium on pavement cuts based on the city's pavement management plan.6. Utilize conduit stabilization such as anchors, staples or other weighting methods.
Permitting
Utility Owner as Permit Holder
Ensure the utility owner holds the construction permit and has a local contact to manage the work.
Permitting Fees
Permitting fees should cover agency costs. An agency may require supplemental staff for microtrenching projects. Establish permit and license fees that cover these and other project administration and monitoring costs.
Warranty and Bonding Requirements
Follow agency requirements on warranty and bonding, keeping it consistent for all utilities.

Maintenance and Repair Requirements

Consider and define maintenance expectations, repair requirements, and timelines.

1. The utility owner continuously blue stakes the fiber optic cable in accordance with local and state dig laws.
2. Specify expectations for repair such as: All damage, including trench reinstatement and any damage to city or private assets, must be repaired within seven days.

Agency Indemnification

Include a clause indemnifying the agency and its contractors for work inside the right of way in the installation agreement, license, or permit. Indemnification may include:

1. Utility owner is responsible for damage or destruction to their facilities during maintenance or installation activities.
2. Utility owner is responsible for relocation of facilities in conflict with agency maintenance or installation activities.
3. Examples include activities necessary to maintain stormwater infrastructure, water distribution, sanitary sewer, sidewalks, roadway, paving, signal installation or other activities at the discretion of the agency.

See the City of Henderson (NV) Microtrenching Guidelines for sample language to cover indemnifications.

Microtrenching Documentation

Require pre-construction and post-installation documentation for all projects.

1. At the time of permit application, a plan showing the proposed installation location and details.
2. The identification and location of existing utilities in the area (i.e., thorough investigation via blue staking) are included in the permit application.
3. Once conduit and/or fiber is installed, the permit holder submits electronic files including the geographic location of the facilities (i.e., KMZ files).

Project Management

Project Communications

Require project communications, such as door hangers, newsletters, social media posts, and updates to city leadership and elected officials.

Project Coordination

Include regular coordination meetings with the project owner to discuss the project schedule, progress, and issues. Keep the utility companies informed about proposed pavement management and capital improvement projects where they can take advantage of installing fiber optic cable and conduit without having to cut new pavement.

Other Considerations

Agency Communications Needs

Consider agency communications needs and infrastructure sharing options. Depending on agency need, request access to strands of fiber optic cable for city business or a spare conduit for the city's future use.

New Installation Methods

Track the viability of new installation methods. Nanotrenching may not be ideal due to challenges with shallow trench depth and a history of fiber damage. Monitor and evaluate newer methods of installation under development to understand the longevity of materials and effects on pavement management. Pavement condition heavily contributes to the success or challenges experienced during installation and future pavement management activities will require close coordination with the utility owner(s).

Multiple Trenches

Accommodate installation of microtrenched fiber optic cables by multiple service providers by including a minimum horizontal and vertical separation distance and more robust surface restoration, such as an 18-inch or 24-inch T-top mill and overlay.