



Date: September 14, 2020; Revised May 16, 2023

Re: Policy Clarification –Keyhole Excavation Backfill Requirements

OVERVIEW:

Keyhole excavation is defined as using a coring device to cut a circular hole through the roadway pavement, sidewalk, or surface to allow the intact core of pavement to be extracted. Keyhole excavation also involves the removal of underlying material from the ground by the water or air vacuum excavation method and includes its disposal of those materials to locate underground utilities. For this policy, the definition also includes hydro excavation and air excavation in soft surfaces.

This policy clarification seeks to document the acceptable method for backfill and repair of these excavations in the public right-of-way.

POLICY:

Keyhole excavation coring and backfilling shall meet the following requirements:

Asphalt Pavement Section:

- Keyhole excavation shall not be placed in the wheel path of a travel lane or within 10-feet of a crosswalk.
- All keyholes in the pavement shall be cored with a circular coring saw with a maximum diameter of twelve (12) inches. The plug shall be carefully removed without causing damage to the plug. The plug shall be marked and stored off site until it is returned in the core hole.
- Bore mud used during excavation shall be removed prior to backfilling.
- Keyhole excavations shall be backfilled with controlled low strength material (CLSM) in conformance with Addendum 3: Revision to Section 206, prior to asphalt restoration. Native material removed shall not be used to backfill the pothole.
- All plugs will be placed back in the corresponding hole in the original orientation at the time of restoration. The sides of the plugs shall be coated and the top sealed with permanent bonding agent.
- If the core plugs are damaged or cannot be used to fill the core hole, the asphalt shall be repaired using hot mixed asphalt paving material from the City-approved list.
- The core holes shall be cleaned and tacked prior to placing hot mix asphalt paving material as follows:
 - Residential/Collector: Six (6) inches minimum of hot mix asphalt paving material
 - Arterial: Twelve (12) inches minimum of hot mix asphalt paving material
- If the asphalt pavement is on a moratorium road, localized infrared treatment will be required to blend the top mat of the asphalt together, per the City's Asphalt Repair Policy.

Concrete Pavement Section:

Keyhole excavations shall avoid concrete pavement sections to the maximum extent possible.



- If it is necessary for keyhole to be located within a concrete pavement section, the restoration will require the whole panel (joint to joint where the core is located) to be removed and replaced. The replacement will include doweling into the adjacent concrete pavement and reinforcement per the City's concrete pavement details with a City-approved Concrete Mix Design.
- Concrete removed adjacent to asphalt pavement shall be follow the City's Pavement Replacement Details (e.g., removal and replacement of two (2) feet of asphalt adjacent to the removed concrete) unless otherwise approved by City Engineering in writing. If the asphalt pavement is on a moratorium road, localized infrared treatment will be required to blend the top mat of the asphalt together per the City's Asphalt Repair Policy.
- Bore mud used during excavation shall be removed prior to backfilling excavations.
- Utility locate pothole/keyhole excavations shall be backfilled with controlled low strength material (CLSM) in conformance with Addendum 3: Revision to Section 206. Native material removed shall not be used to backfill the pothole prior to concrete panel replacement.

Concrete – Cross pans, Sidewalks, Curb Ramps, Curb and Gutter Section:

Keyhole excavation shall avoid cross pans, sidewalks, curb ramps, and curb and gutter to the maximum extent possible.

- If a keyhole is in a cross pan, sidewalk, curb ramp, curb, or gutter, the entire panel (e.g., joint to joint) shall be removed and replaced.
- Bore mud used during excavation shall be removed prior to backfilling excavations.
- Keyhole excavations shall be backfilled with controlled low strength material (CLSM) in conformance with Addendum 3: Revision to Section 206. Native material removed shall not be used to backfill the pothole.
- Concrete removed adjacent to asphalt pavement shall be follow the City's Pavement Replacement Details (e.g., removal and replacement of two (2) feet of asphalt adjacent to the removed concrete) unless approved by City Engineering in writing. If the asphalt pavement is on a moratorium road, localized infrared treatment will be required to blend the top mat of the asphalt together, per the City's Asphalt Repair Policy.

Soft Surfaces (Parkways, Green Spaces, and Amenity Zones) Section:

- Keyhole excavation located in soft surfaces (landscaping or native vegetation) within two (2) feet of the existing roadway shall be backfilled with controlled low strength material (CLSM) in conformance with Addendum 3: Revision to Section 206.
- If keyhole excavation is in soft surfaces and is extended under (routed out) asphalt, cross pans, sidewalks, curb ramps, or curb and gutter, the contractor shall follow the backfill and repair requirements outlined above.
- If keyhole excavation is less than two (2) feet in depth, it can be backfilled with moisture-treated and compacted soil per Section 200 of the City Standard Specifications.
- Native material excavated by hydro/air excavating shall not be used to backfill the pothole. Native material excavated via hand or excavator may be reused to backfill the excavation to backfill, provided it is moisture-treated and compacted per in Section 200 of the City Standard specifications.



- Excavations greater than two (2) feet in depth and greater than two (2) feet away from any hard surface (e.g., sidewalk, pavement, etc.) can be filled with bentonite or comparable material approved by City Engineering to within two (2) feet of the soft surface (ground) and backfilled with moisture-treated, compacted fill per Section 200 of the City Standard Specifications.
- Any damaged landscaping, lawns, shrubbery, trees hedges, walls, fences, irrigation, etc. shall be replaced or restored prior to seven (7) days after the completion of the job, at the contractor's expense, and to the condition equal to or better than the existing prior to excavation.

Variances to this policy must be approved in writing by the City Engineer.

In no instance shall gravel in any form be used for filling in utility locate keyholes/potholes.

Compaction and materials surrounding Colorado Springs Utilities (CSU) infrastructure shall meet the requirements specified in CSU's standards and specifications.

Initial locate potholes may be temporarily repaired, meeting all applicable safety requirements, for no more than fourteen (14) days unless additional time is authorized by the City in writing.

Note: The permit holder is responsible for researching and locating all underground utility lines including storm sewer systems and related drainage facilities.

