## TABLE OF CONTENTS

### INTRODUCTION ................................................................................................................................. 3
### ACKNOWLEDGEMENTS ......................................................................................................................... 3

### I. PERMITTING PROCESS OVERVIEW ............................................................................................... 4
   A. The Basics ......................................................................................................................................... 4
   B. Permit Processing Time-frames and Advanced Notification Best Practices ................................. 4

### II. UTILITY INSTALLATIONS ............................................................................................................. 5
   A. Quality Workmanship Expectations and Best Practice Considerations ........................................... 5
   B. General Restrictions, Deadlines, and Requirements ........................................................................ 5
   C. Two-Year Pavement Cut Moratorium ............................................................................................... 6
   D. Road Surface Overcut Repairs .......................................................................................................... 6
   E. Excavation Repair Standards for Concrete Pavements .................................................................... 6
   F. Formal Deviation Request Process ................................................................................................ 7

### III. PERMIT INSPECTIONS AND MATERIALS TESTING ................................................................. 7
   A. Scope of UDOT Permit Inspections ................................................................................................. 7
   B. Inspection Call-In Notification Requirements ................................................................................ 7
   C. General Testing Requirements ........................................................................................................ 7
   D. Worksite Materials Storage ............................................................................................................ 8
   E. Traffic Control Requirements ......................................................................................................... 8

### IV. CONSTRUCTION DETAILS .......................................................................................................... 8
   A. Protection of Existing Improvements: ............................................................................................ 8
   B. Minimizing Public Impacts .............................................................................................................. 9
   C. Temporary Surfacing Requirements .............................................................................................. 9
   D. Permanent Pavement Patching Requirements .............................................................................. 10
   E. Removal and Replacement of Substandard Work .......................................................................... 10
   F. 3-Year Performance and Warranty Requirement ............................................................................ 10

### V. REMOVALS – INCLUDING EXPLORATORY POTHOLES .......................................................... 11
   A. Paved Streets ................................................................................................................................. 11
   B. Gravel Streets and Driveways ......................................................................................................... 11
   C. Concrete Curb, Gutter, and Sidewalk ............................................................................................ 12

### VI. BACKFILL ..................................................................................................................................... 12
   A. Flowable-Fill and Utility Trench Fill Requirements ........................................................................ 12
   B. Conventional Backfill Other Than Flowable Fill .......................................................................... 13
     2. Initial Lift Requirements .............................................................................................................. 13
     3. Intermediate Lift Requirements .................................................................................................. 13
     4. Final Lift Requirements .............................................................................................................. 13

### VII. RESTORATION ............................................................................................................................ 13
   A. Exploratory Potholes Requirements - Vertical and Horizontal ....................................................... 13
   B. Sub-Grade Requirements .............................................................................................................. 14
   C. Asphalt Surfacing Requirements .................................................................................................. 14

### REGION MAP ..................................................................................................................................... 15
### REGION PERMITS CONTACT INFORMATION .................................................................................... Error! Bookmark not defined.
### HELPFUL WEB LINKS .......................................................................................................................... 16
### REFERENCE LIST ............................................................................................................................... 16
INTRODUCTION

The Permit Excavation Handbook serves as an operational guide for excavation contractors, utility owners, and other interested stakeholder groups who perform permit-related excavation work within the Utah Department of Transportation (UDOT) right-of-way.

It is designed to maximize the use of standard excavation practices, reduce adverse level of service impacts, and to increase the lifespan of roadway repairs. It also lays a solid foundation for improving industry-specific and regulatory-based consistency throughout the state.

In this way, standardizing permit-related processes is a critical goal, because standardization improves consistency. In turn, consistency improves performance, and improved performance results in a higher return on investment for everyone’s bottom line.

To this end, UDOT is driven by a functional set of strategic goals as noted below.

These strategic goals are guideposts for making policy-based decisions and they are an effective aid in successfully navigating towards systems-based performance improvements.

This handbook is intended to complement the underlying laws, rules, policies, or specifications from which it is built. Developing a thorough understanding of these foundational documents is a critical business necessity. In the event of a conflict between this handbook and its underlying documents the more restrictive will govern.

Following the detailed repair methods described herein will help maintain the right-of-way in an acceptable condition. The applicant can expect a much improved permit-related experience when this handbook is used in conjunction with good planning and judgment.

UDOT encourages all of its industry partners to distribute this handbook as required reading for all field professionals who have decision making authority in active excavation areas within UDOT’s right-of-way.

ACKNOWLEDGEMENTS

UDOT would like to formally thank the key staff members who labored to produce this handbook. Their collective contributions are reflective of UDOT’s broader organization and they were clearly driven to serve in a capacity that goes well beyond the ordinary call of duty.

UDOT would also like to thank its many industry partners. Your interests were a principal consideration as we worked towards capturing the fundamentals of excavation-related requirements in a simplified and easy to reference handbook.
I. PERMITTING PROCESS OVERVIEW

A. The Basics

1. These basic requirements are not all inclusive and other conditions may apply. This section is intended to only provide a basic overview on the overall minimum requirements necessary before a permit can be issued or before any excavation work can begin.

   a. **Statewide Utility License Agreement (SULA) Required:** Utility companies desiring to use right-of-way under the jurisdiction of UDOT for the installation or maintenance of any utility facility must be licensed to do so by entering into a license agreement with UDOT.

   b. **Permit Required:** State law prohibits all state highway access for purposes of digging, excavating, placing, constructing, or maintaining any approach road, driveway, pole, pipeline, conduit sewer, ditch, culvert, billboard, advertising sign, or any other structure or object of any kind or character within the right-of-way without first obtaining a permit.

   c. **Liability Insurance Coverage and Bonding Requirements:** State law provides the basis for requiring minimum liability insurance coverage and bonding requirements before a permit can be issued. These required liability reduction instruments are typically structured in the form of a bond and a certificate of minimum liability insurance. Administrative rules further define the types of bonds required along with the minimum allowable coverage requirements.

   d. **Notice of Excavation (Blue Stake) Requirements:** State law requires an excavator to notify each operator with an underground facility at least 48-hours prior to starting any type of excavation work. UDOT partners with Blue Stakes of Utah, a one-call center, to aid excavators with meeting this legal requirement. Blue Stakes may also be notified if there is an after-hours emergency relating to any excavation site. See the “Helpful Web Links” section at the end of this document for more information on this mandated utility location and notification program.

   e. **Permit and Inspection-Related Costs:** UDOT’s Encroachment Permit Program recovers program administrative costs through permit and inspection-related fees. The fees vary based on a point system that considers the type of permit, the level of impact, ADT, whether inspections are required after normal business hours, and similar cost metrics. See the “Helpful Web Links” at the end of this document for a link to UDOT’s Encroachment Permit Fee Table, or contact one of UDOT’s Region Permit Offices for more information.

B. Permit Processing Time-Frames and Advanced Notification Best Practices

1. How much advanced notice does UDOT need to issue an encroachment permit? This is a simple question with a complex answer because there are large differences between various types of encroachment permits. **The statewide encroachment permit turnaround performance target is 72-hours.**

The level of review and applicant submission requirements may change in relation to the level of encroachment complexity and the size of the proposed project. The speed of the review process is also largely impacted by the quality of the applicant’s submitted application materials. As a result, some applications can be processed within a few days (minimal impacts), while others may require significantly more lead time (large-scale impacts).

UDOT permits staff uses best efforts to process encroachment permit applications in a timely and responsible manner. It is considered a best practice for the applicant to carefully evaluate the size,
scale, and scope of the project they are undertaking when determining how much advanced notice is appropriate to provide for more complex encroachment permit applications. In general, applicants that begin an early project dialogue with UDOT and applicants who submit thoroughly detailed applications can expect shorter permit review, evaluation, and processing times.

II. UTILITY INSTALLATIONS

A. Quality Workmanship Expectations and Best Practice Considerations

1. Road Surface Lifespan Considerations: Excavations and street repairs shorten the useful lifespan of road surfaces. Open utility cuts are only considered as a last resort when all other alternative methodologies are proven ineffective. Great care must be applied when trenchless methods are not possible and an open trench excavation becomes unavoidable to ensure lift specifications, compaction requirements, pavement restoration techniques, etc. meet the highest available industry performance standards. Anything less inevitably results in distressed repairs, which in turn, transfer future maintenance and restorative costs directly onto the public or back onto the permit holder.

2. Damage Prevention Measures: A best practice is to avoid weakening or destroying the existing road surface around an excavation with things such as heavy equipment, stockpiling, and material deliveries. Clean double saw cuts are required prior to excavating any road surface and all excavated materials must be broken up in a manner that does not cause damage to the road surface outside the limits of the trench. In addition, R930-7 requires trenches to have vertical faces. It also specifies the maximum trench width at two (2) feet or the outside diameter of the pipe plus one and one-half (1 ½) feet on each side. These required provisions are all designed to increase the life span of the road surface and reduce avoidable damage-related costs resulting from carelessness or poor workmanship.

3. Worksite Restoration Requirements: Disturbance of areas within highway right-of-way during utility construction must be kept to a minimum and all right-of-way must be restored to the satisfaction of UDOT. The quality of the road surface repair needs to meet or exceed the pre-excavation road surface conditions when an excavation is complete. The after condition must provide at a minimum the same level of surfacing quality as was found in the before or pre-excavation condition.

B. General Restrictions, Deadlines, and Requirements

1. Open Trench Restrictions: Open trench utility installations are not permitted unless an acceptable trenchless method is unfeasible such as in unsuitable soil conditions or extremely difficult rock. UDOT will consider a written letter from two separate contractors specifically indicating their attempts to bore were unsuccessful as minimum justification in considering a deviation from this open trench restriction.

2. Transverse Crossing Restrictions: Utility crossings must be at 90 degrees unless a deviation is approved by UDOT. Crossing installations under paved surfaces must be by trenchless methods.

3. Pavement Restoration Deadline: All pavement restoration work performed by the utility company must be completed within 48 hours after the excavation and backfill is completed.

4. Jetting Restrictions: Jetting by water or compressed air is not permitted.
5. **Artifact Discovery Work Restriction and Notification Requirements:** Immediately stop all work and contact the assigned Region Permit Officer if a suspected historic, archeological, or paleontological (fossil) item, feature, or site is encountered\(^1\).

6. **Pavement End Date Restrictions:** Unless otherwise approved in writing by UDOT utility cuts and paving activities are prohibited between the months of October 15, through April 15\(^2\).

C. **Two-Year Pavement Cut Moratorium**

1. **Standing Moratorium:** UDOT enforces a two-year pavement cut moratorium on all newly paved or constructed roadways\(^2\).
   a. Cutting, pot holing, or excavating a UDOT roadway that is less than two years old is prohibited.
   b. The permittee is responsible for ensuring a roadway is not under a cut moratorium before applying for a permit.

2. **Emergency Exceptions:** The responsible utility company must comply with any special conditions imposed by UDOT regarding restoration of the roadway if an emergency cut or excavation occurs\(^2\).

3. **Unintentional Pavement Damage in Moratorium Area:** Milling and overlaying to UDOT specifications is required in any pavement cut moratorium area damaged by excavation-related activities\(^2\).
   a. This condition applies regardless of whether the moratorium was part of any stated permit limitations.

D. **Road Surface Overcut Repairs**

1. **Explanation:** Road surface overcuts occur when the circular saw blade used to cut the road surface runs just beyond the intended excavation area at the corners of the saw cuts. This condition is normally unavoidable and must be properly repaired or road surface damage will develop.

2. **Repair Process\(^2\):**
   a. Overcut repairs need to be completed as soon as the new road surface is set to minimize traffic impacts.
   b. Use a high-pressure system to blow out, clean, and dry overcut repair areas.
   c. Apply a UDOT approved crack seal or epoxy. See UDOT Specification 02745(2.3) for asphalt surfaces. See UDOT Specification 02754S for concrete surfaces.
   d. Ensure all overcut areas are thoroughly sealed.

E. **Excavation Repair Standards for Concrete Pavements**

1. **Pre-cast Concrete Paving Slabs (PCPS):** UDOT requires the use of Pre-Cast Concrete Paving Slabs (PCPS) for most excavations that involve cutting into concrete roadways where high ADT’s are present. The purpose of this requirement is to minimize the impacts to the traveling public by shortening lane closure times\(^12\).
a. The depth may vary when replacing concrete roadways. The existing depth must be matched when replacing concrete panels or a twelve (12) inch minimum.

b. Panel replacement must meet UDOT standard PV-4 or latest supplemental drawing.

c. Concrete panel replacements must meet the requirements of Section 02754S (Supplemental Provision) and be installed by an approved vendor.

2. Alternative Methods and Exception:

   a. An exception for “pour-in-place” concrete pavements may be made provided the Region Permit Office determines this alternative repair methodology is safe, effective, meets all other UDOT requirements, and will not create unacceptable lane closure delays.

   b. Any such exception requires prior written approval from UDOT.

F. Formal Deviation Request Process

   1. Any request to deviate from established permitting standards must conform to the formal deviation procedures defined in R930-7-13.

III. PERMIT INSPECTIONS AND MATERIALS TESTING

A. Scope of UDOT Permit Inspections

   1. All construction work within the state’s right-of-way is subject to inspection by UDOT.

      a. The assigned Region Permit Officer will determine the number and frequency of inspections or tests required to demonstrate conformity with UDOT requirements.

      b. Any work performed without a required inspection is subject to complete removal and replacement at the permit holder’s expense.

B. Inspection Call-In Notification Requirements

   1. The person performing the work authorized by the permit is responsible for notifying UDOT when work is ready for inspection.

   2. Every request for inspection must be called in at least 24-hours before the inspection is desired.

C. General Testing Requirements

   1. **Materials Testing:** The permit holder is required to provide materials testing for each phase of the work to effectively demonstrate conformity with UDOT requirements.

      a. All material quality testing must be paid for by the permit holder at no cost to UDOT.

      b. The permit holder is responsible for providing safe worksite access for UDOT personnel, as required, to complete any materials-related testing.
2. **Third-Party Testing:** Third-party quality, density, and thickness tests may be required to ensure compaction requirements are met and to ensure an appropriate compacted thickness of repair material has been placed.

   a. Third-party testing firms must be selected from the approved UDOT material testing list.
   
   b. Third-party testing firms must be identified on the permit application as a subcontractor.
   
   c. Testing reports must be made available to UDOT upon demand and must be kept as part of the project’s field inspection record.

3. **Pavement Testing:** Pavement quality testing may be required for major projects that involve excessive material hauls, heavy construction equipment activity, or non-destructive quality testing before and after construction.

   a. The full pavement section may be rejected by UDOT if sections with deficient thickness or density are found. All such sections must be removed and reinstalled by the permit holder at the permit holder’s expense.

D. **Worksite Materials Storage**

   1. Materials storage in UDOT’s right-of-way, such as flowable fill, base materials, concrete, asphalt, epoxy, crack seal, or any other form of materials is prohibited without the permission and oversight of the assigned Region Permit Officer.

E. **Traffic Control Requirements**

   1. All Traffic Control placed on UDOT roadways must:

      a. Conform to the current MUTCD.
      
      b. Conform to UDOT Standard Drawings and Standard Specifications for Road and Bridge Construction.
      
      c. Be signed and sealed by a professional engineer licensed in the State of Utah or a certified Traffic Control Supervisor.
      
      d. Be reviewed by the appropriate UDOT Region Permit Office.
      
      e. Be placed and maintained by a Certified Traffic Control Maintainer.

IV. **CONSTRUCTION DETAILS**

A. **Protection of Existing Improvements:**

   1. The following conditions apply to all work done within the public right-of-way such as utility line installation or repairs performed by any permit holder:

      a. Take proper precautions at all times and be responsible for the protection of existing utilities, street and alley surfaces, driveway culverts, street intersection culverts or aprons, irrigation systems, mail boxes, driveway approaches, curb, gutter, sidewalks, landscaping, fencing, and all other identifiable installations that may be encountered during construction.
b. Contact Blue Stakes for field marking of utility locations a minimum of 48-hours before the proposed start of work. Do not begin work until Blue Stake clearance is obtained.

c. Take proper precautions to protect property markers, pins, corners, and survey control monuments encountered during construction. A Utah Licensed Professional Land Surveyor must replace any damaged or disturbed survey markers.

d. The repair of any damaged improvements as described above is the sole responsibility of the permit holder.

B. Minimizing Public Impacts

1. **Good Neighbor Practices:** Working within the right-of-way can generate negative external impacts for the traveling public and for nearby property owners. Minimizing these known impacts helps to ensure work stays on schedule. It also helps preserve good will in the community where the work is taking place. Being proactive in these efforts significantly reduces nuisance-related complaints. For these reasons, UDOT has adopted the following “good neighbor” practices:

   a. All permit holders must make adequate provisions to ensure traffic and adjacent property owners experience a minimum of disruption, noise, and inconvenience.

   b. All permitted work must be diligently executed to completion in a timely and expeditious manner through efficient project scheduling.

   c. Although speed is a principal goal in minimizing negative impacts, speed should never compromise safety or an unwavering commitment to quality workmanship.

   d. All work including pavement replacement and cleanup must be completed within the number of days specified on the approved permit.

   e. Written approval from the assigned Region Permit Officer is required for a completion time extension (including extensions for inclement weather delays).

   f. UDOT has the right to repair the street at the permit holder’s expense if the repairs are not completed in the allotted time.

C. Temporary Surfacing Requirements

1. Temporary surfaces are a critical component in maintaining highway and worksite safety. They can significantly reduce potential life-safety hazards and minimize collateral damage to adjacent road surfaces when properly installed. The following is a list of requirements governing the proper use and installation of temporary surfacing:

   a. Temporary asphalt surfaces are required on any street cut opening when the final surface is not installed at the end of each workday.

   b. Installation and maintenance of a hot or cold mix asphalt paving material as temporary cover is the responsibility of the permit holder until the permanent surface is completed and accepted.
c. Temporary surfaces must be compacted, rolled smooth, and sealed to prevent degradation of
the repair and existing structures during the temporary surfacing period.

d. All steel plates must be milled into the asphalt so they are flush with the existing surface
unless otherwise approved in writing by UDOT.

e. Use sign W8-24 “Steel Plate Ahead” when steel plates are placed on the roadway. Place sign
WI-1 “Bump” with a W16-7P diagonal downward pointing arrow adjacent to the steel plate.

f. Surface plates (when approved) must be placed using mastic and secured to the existing
pavement by mechanical means.

g. Plates should be welded together whenever possible to avoid slippage and pinned in place
using approved dowels.

h. Hot or cold mix asphalt must be placed around the perimeter surface of the plate.

D. Permanent Pavement Patching Requirements

1. Permanent patching must occur within 48-hours after completion of excavation and backfill unless
otherwise specified by the terms and conditions on the permit.

2. All permanent pavement patches and repairs must be made with "in kind" materials.

   a. The use of concrete in asphalt-related repairs or asphalt in concrete-related repairs is
      prohibited.

   b. Any repair not meeting these requirements will be rejected and must be removed and
      replaced by the permit holder at no expense to UDOT.

E. Removal and Replacement of Substandard Work

1. The following provisions apply where substandard work products are identified:

   a. Substandard work products must be removed and replaced within 15-days of written
      notification from UDOT.

   b. Written notification from UDOT will identify the deficiency and suggest corrective remedies.

   c. If the substandard work product presents a potential life-safety hazard UDOT will not
      provide the 15-days of written notification as noted above and will require immediate
      corrective action.

   d. UDOT will take action on the permit holder's bond to cover all related costs if the
      replacement work is not completed within the time specified.

F. 3-Year Performance and Warranty Requirement

1. The permit holder is responsible for any patch-related defects for 36 months.
V. REMOVALS – INCLUDING EXPLORATORY POTHOLES

A. Paved Streets

1. The following provisions apply to removals on paved streets:

   a. Bituminous pavement removal areas must be saw-cut to clean, straight lines that are perpendicular or parallel to the flow of traffic.

   b. Asphalt must be cut to full depth and “overcut” so the vertical and horizontal intersection of the cuts is at full asphalt depth. UDOT Standard Specification Section 02705 Pavement Cutting provides additional information related to this topic.

   c. All excavations within thirty-six (36) inches of the edge of the asphalt in existing pavement is required to be removed and replaced from the edge of asphalt to the excavation edge.

   d. Replace asphalt placed in the wheel path of the lane from the fog line (line used to delineate outer edge of the travel lane) to skip line.

   e. Double cut all asphalt excavations. The first cut allows removal of asphalt so excavation can be accomplished. The second cut provides a clean surface that must be exposed just before paving.

   f. The final section of asphalt will stay in place until all excavation is complete and flowable fill is in place. This helps prevent contamination from debris that will prevent the asphalt edge from accepting the tack coat9.

   g. Remove concrete pavement, driveways, streets, and alleys to neatly sawed edges cut to full depth12.

   h. Double cut concrete to avoid cut edges from spalling and chipping when being removed18.

B. Gravel Streets and Driveways

1. The following provisions apply to removals on paved streets:

   a. Just adding additional gravel to the surface is not sufficient. The entire depth must be reprocessed and re-compact ed.

   b. The permit holder must replace cross trenches excavated in streets, driveways, or alleys that have only a gravel surface on a satisfactory compacted backfill with gravel conforming to UDOT specifications for aggregate base course6.

   c. Gravel replacement must be one (1) inch greater in depth to that which originally existed, but not less than six (6) inches. The surface must conform to the original street grade.

   d. Additional gravel base must be placed and compacted by the permit holder within fourteen (14) days after being notified by UDOT to restore the roadbed surface to finished grade where the completed surface settles.
C. Concrete Curb, Gutter, and Sidewalk

1. The following provisions apply to curb, gutter, and sidewalk removals:
   a. Concrete must be removed to neatly sawed edges to full depth for sidewalks and curb and gutter and must be saw-cut in straight lines either parallel to the curb or perpendicular to the alignment of the sidewalk or curb
   b. Any removal must be done to the nearest joint. Replaced sections may require doweling connections if required by the Region Permit Officer
   c. Asphalt impregnated expansion joints must be installed every ten (10) feet
   d. Asphalt must be saw-cut at lip of curb and the asphalt serves as the form for the placement of the new concrete for drive approaches and curb and gutter replacement
   e. AA/AE UDOT approved concrete is a minimum standard for all replacement concrete as well as the use of a UDOT approved curing compound on all newly placed concrete including minor repairs
   f. Use oil impregnated fiber for all cold joints for expansion purposes to UDOT specifications. Cement fiber material is not permitted on UDOT projects

VI. BACKFILL

A. Flowable-Fill and Utility Trench Fill Requirements

1. The following provisions apply to flowable fill:
   a. Use flowable fill as utility trench backfill for all trenches and excavations under the asphalt for all permit related work unless otherwise specified in writing and approved by UDOT.
   b. A minimum of thirty-six (36”) inches of UDOT approved flowable fill must be placed to the bottom of the existing asphalt unless otherwise specified in writing and approved by UDOT.
   c. Concrete backfill will not be allowed within the public right-of-way
   d. Use only UDOT approved flowable fill from a UDOT approved source. A list of approved vendors in your area is available online or contact the assigned UDOT Permit Officer for a current list.
   e. Flowable fill is prohibited as a temporary or permanent street surface
   f. Bridging and cutback requirements as described in these standards may still be required if the street failures indicate a clear need
   g. Repair of failed trenches is the responsibility of the UDOT Permit holder
B. Conventional Backfill Other Than Flowable Fill

1. **Conventional Backfill Categories:** Backfill in existing or proposed streets, curbs, gutters, sidewalks, and alleys is divided into three (3) lift categories as follows when “non-flowable fill” backfill materials are approved by UDOT:
   
   a. Initial
   
   b. Intermediate
   
   c. Final

2. **Initial Lift Requirements**
   
   a. Place a minimum of 36 inches of 2 inch minus UDOT approved granular borrow in 6 inch lifts from the top of the utility to the intermediate lift.
   
   b. Compaction requirements for 2 inch minus granular borrow must be no less than 95 percent of maximum density for sidewalks and shoulders and no less than 97 percent for all roadways, verified by a third-party testing firm at the permit holder’s expense.

3. **Intermediate Lift Requirements**
   
   a. Place a total of 6 inches of UDOT approved untreated base course (UTBC) with 97 percent compaction to the bottom of existing asphalt or within seven inches of final roadway grade, verified by a third-party testing firm at the permit holder’s expense.

4. **Final Lift Requirements**
   
   a. Place a minimum of seven (7”) inches of any UDOT approved Performance Grade Asphalt or match the existing asphalt depth (whichever is greater).
   
   b. The permit holder must use UDOT approved Asphalt/Concrete.
   
   c. Asphalt must have a minimum temperature of no less than 190 degrees Fahrenheit.
   
   d. The asphalt must be placed in three 3 – 3½ inch lifts and compacted to meet UDOT standards which is a 93.5 percent of maximum specific gravity.
   
   e. Road base material must meet UDOT specification for aggregate base course or as specified by UDOT.

VII. **RESTORATION**

A. **Exploratory Potholes Requirements - Vertical and Horizontal**

   1. The following provisions apply to vertical and horizontal exploratory potholes:
      
      a. Use patching material compatible with the existing surface.
      
      b. Replace sub-grade with UDOT approved flowable fill to provide necessary support to the surface under all asphalt surfaces.
c. Sealing exploratory pot holes is the responsibility of the permit holder or the person making the hole.

d. The limits of repair for openings greater than six (6) inches in diameter are the same as any asphalt repair done in UDOT’s right-of-way.

e. Make sure the completed job is flush with the surrounding pavement and has no indentations, pockets, or recesses that may trap and hold water. Deflection must be less than ¼ inch in a 10 ft area.

f. Seal all edge seams and overcuts with an approved UDOT crack seal.

B. Sub-Grade Requirements

1. The following provisions apply to sub-grade requirements.

   a. Grade the pavement sub-grade to conform to the cross sections and profile required by the construction plans and UDOT requirements.

   b. Properly prepare the sub-grade before placing aggregate base course or sub-course.

   c. Scarify the sub-grade to a minimum depth of 6 inches, adjust moisture as necessary, and re-compact.

   d. Compact all utility main and service trenches before approval to place the base or sub-base course.

   e. The density requirement also applies to all utility trenches within the public right-of-way.

C. Asphalt Surfacing Requirements

1. The following provisions apply to asphalt surfacing.

   a. Repair any damage, even superficial, to the existing asphalt surface in the vicinity of the work at no cost to UDOT including but not limited to gouges, scrapes, outrigger marks, and backhoe bucket marks.

   b. A slurry seal covering is considered the minimum repair for the above referenced damage.

   c. Full depth patching may be required at the discretion of the assigned Region Permit Officer.

   d. The depth of asphalt patches in asphalt streets will typically be the depth of the existing asphalt surface plus one (1) inch or as specified by the Permits Department.

   e. The asphalt patch area for street excavations that fall within the wheel path of the vehicle travel lane must be increased in size to the center of the lane or adjacent lane.

   f. In no circumstance will the edge of a patch area be allowed to fall within the wheel path.

   g. UDOT reserves the right to deny any street excavation or require repairs that are over and above these specifications in streets that are less than two years old including surface restorations such as mill and overlay.
HELPFUL WEB LINKS

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<thead>
<tr>
<th>Name</th>
<th>Web Address</th>
</tr>
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<tr>
<td>UDOT Permits Home Page</td>
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<td><a href="HTTP://WWW.BLUESTAKES.ORG/">HTTP://WWW.BLUESTAKES.ORG/</a></td>
</tr>
<tr>
<td>Blue Stakes Excavation Guide (English/Spanish)</td>
<td><a href="HTTP://WWW.BLUESTAKES.ORG/HTML/EXCAVATORSGUIDE.HTM">HTTP://WWW.BLUESTAKES.ORG/HTML/EXCAVATORSGUIDE.HTM</a></td>
</tr>
<tr>
<td>Manual on Uniform Traffic Control Devices (MUTCD)</td>
<td><a href="HTTP://MUTCD.FHWA.DOT.GOV/">HTTP://MUTCD.FHWA.DOT.GOV/</a></td>
</tr>
</tbody>
</table>

REFERENCE LIST

<table>
<thead>
<tr>
<th>Number</th>
<th>Section</th>
<th>Title</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>01355</td>
<td>Environmental Protection</td>
</tr>
<tr>
<td>2.</td>
<td>01554</td>
<td>Traffic Control</td>
</tr>
<tr>
<td>3.</td>
<td>01558</td>
<td>Temporary Pavement Markings</td>
</tr>
<tr>
<td>4.</td>
<td>02056</td>
<td>Embankment, Borrow &amp; Backfill</td>
</tr>
<tr>
<td>5.</td>
<td>02705</td>
<td>Pavement Cutting</td>
</tr>
<tr>
<td>6.</td>
<td>02721</td>
<td>Untreated Base Course</td>
</tr>
<tr>
<td>7.</td>
<td>02741</td>
<td>Hot Mix Asphalt</td>
</tr>
<tr>
<td>8.</td>
<td>02746</td>
<td>Asphalt Material</td>
</tr>
<tr>
<td>9.</td>
<td>02748</td>
<td>Prime Coat/Tack Coat</td>
</tr>
<tr>
<td>10.</td>
<td>02752</td>
<td>Portland Cement Concrete Pavement</td>
</tr>
<tr>
<td>11.</td>
<td>02753</td>
<td>Full Depth Slab Replacement for Concrete Pavements</td>
</tr>
<tr>
<td>12.</td>
<td>02754S</td>
<td>Pre-case Concrete Paving Slabs for Full Depth Slab Replacement</td>
</tr>
<tr>
<td>13.</td>
<td>02765</td>
<td>Pavement Marking Paint</td>
</tr>
<tr>
<td>14.</td>
<td>02776</td>
<td>Concrete Sidewalk, Median Filler, and Flatwork</td>
</tr>
<tr>
<td>15.</td>
<td>02890</td>
<td>Retroreflective Sheeting</td>
</tr>
<tr>
<td>16.</td>
<td>03055</td>
<td>Portland Cement Concrete</td>
</tr>
<tr>
<td>17.</td>
<td>03575</td>
<td>Flowable Fill</td>
</tr>
<tr>
<td>18.</td>
<td>N/A</td>
<td>PV Series Standard Drawings: PV 4</td>
</tr>
<tr>
<td>19.</td>
<td>N/A</td>
<td>SN Series Standard Drawings</td>
</tr>
<tr>
<td>20.</td>
<td>N/A</td>
<td>ST Series Standard Drawings</td>
</tr>
<tr>
<td>21.</td>
<td>N/A</td>
<td>TC Series Standard Drawing: TC 1-16</td>
</tr>
<tr>
<td>22.</td>
<td>N/A</td>
<td>R930-7 Utility Accommodation Rule</td>
</tr>
<tr>
<td>23.</td>
<td>N/A</td>
<td>Manual on Uniform Traffic Control Devices (MUTCD)</td>
</tr>
<tr>
<td>24.</td>
<td>N/A</td>
<td>Utah State Code 72-7-102</td>
</tr>
<tr>
<td>25.</td>
<td>N/A</td>
<td>Utah State Code 54-8a-4</td>
</tr>
<tr>
<td>26.</td>
<td>N/A</td>
<td>UDOT Permit Requirement</td>
</tr>
<tr>
<td>27.</td>
<td>02231</td>
<td>Site Clearing and Grubbing (see 3.6)</td>
</tr>
<tr>
<td>28.</td>
<td>N/A</td>
<td>Utah State Code 72-7-105</td>
</tr>
</tbody>
</table>