

**CITY OF CHARLESTON  
DEPARTMENT OF PUBLIC SERVICE  
ENGINEERING DIVISION**



**UTILITY PAVEMENT CUT  
AND  
REPAIR GUIDELINES**

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OCTOBER 2014



## 1. PURPOSE

The purpose of these guidelines is to establish standard procedures to ensure that entities which cut and excavate streets owned by the City have the knowledge, competence and resources needed to perform the type of size work for which they are permitted to perform. Also, provides guides aimed at the need for better coordination and accountability for employing less intrusive, more durable and cost efficient methods for restoring utility cuts within our paved roads.

## 2. OBJECTIVE

To develop effective restoration techniques for utility pavement cuts. Pavement settlement occurring in and around utility cuts in the City is a common problem, resulting in uneven pavement surfaces, annoyance to drivers, and ultimately further maintenance by the City. In developing these guidelines, APWA, State DOT's and other Municipalities practices were evaluated to determine how the City can benefit from their experiences.

## 3. PERFORMANCE

Utility pavement cut repairs, like other patches that are not done properly; reduce the level of service of our streets and roadways. Factors influencing the performance of these repairs include:

- The pavement material, soil conditions, climate, traffic and repair techniques.
- Poor construction techniques, such as rocking the jackhammer while cutting the boundary of the patch, can damage the area adjacent to the cut and further degrade the patch and surrounding pavement.
- Pavement cut repairs made using quality materials; sound engineering and construction techniques tend to perform as well as the surrounding pavement.
- Poor performance of these repairs tends to be a result of inadequate compaction of the materials, insufficient thickness of materials, poor quality of materials, and damage to the side of the cut.
- To take advantage of the layering effects of a flexible pavement, the compacted base and surface course should be extended at least 2 feet from the edge of the trench. This practice (zone of influence) minimizes the reflective cracking due to excessive strains at the bottom of each layer at the edge of the trench and allows better compaction of the base material and new asphaltic pavement.
- A full lane or roadway width milling and/or paving is required where successive or continuous utility cuts within 10 feet are planned so as not to have an unsightly "checkerboard" type of repair, and to provide a smooth riding surface. The suggested 10-foot length will prevent numerous adjacent small repairs that deteriorate ride quality, appearance and overall performance.



## 4. PERMIT APPLICATION AND NON-CONFORMANCE

### 4.1. Permitting

Any work in City maintained street, alley, or right-of-way requires an engineering permit from the Engineering Division. This permit allows the utility company or a contractor hired by the utility company, or an individual, to conduct the work within the right-of-way. Approval of the Engineering Division is required prior to starting the work. Construction drawings and a site specific traffic control plan issued by the City's Traffic and Transportation Department must be submitted with the permit application form. The placard issued by the Engineering Division authorizing the work must be visible on the job site at all times. If the site involves work within the SCDOT right-of-way, an approved SCDOT encroachment permit is also required. Permit application form and applicable fees can be found at:

<http://www.charleston-sc.gov/DocumentCenter/View/67>

### 4.2. Non-Conformance

Failure to comply with applicable permitting requirements would be considered a violation of City Ordinance Section 21-52, Public Nuisance, as defined in Section 21-51(f) (10), "All obstructions of streets, alleys, sidewalks or crosswalks and all excavations in or under the same, except as permitted by the ordinances of the City or which, although made in accordance with such ordinances, are kept or maintained for an unreasonable length of time after the purpose thereof has been accomplished."

### 4.3. Permit Inspections

Prior to proceeding with the utility cut, the Department of Public Services Engineering Division shall be notified by the permit applicant to verify that the cutting limits and the repair procedures have been agreed and approved by a representative of the Engineering Division.

- Inspection requests shall be made to the Engineering Division by the permittee at least two (2) days prior to the inspection.
- For any street closures a permit is required from the City's Traffic and Transportation Department prior to commencing work.
- Replacement of aggregate base or flowable fill shall not be performed until the trench is inspected and approved by a representative of the Engineering Division.
- At the completion of the installation of the aggregate base or flowable fill, the Engineering Division shall be requested to inspect the backfill. After acceptance of the backfill, the asphalt pavement can be applied.
- The work performed shall be free from workmanship defects for a period of one (1) year after date of acceptance by the Engineering Division.
- Existing pavements, bases, curbs/gutters and sidewalks shall be cut and brought to a neat line by use of an air hammer, saw or other suitable equipment. Expansion joints removed shall be replaced.
- The minimum width of any cut repairs shall be four 4-feet to allow for a roller.



- All repairs shall have a 2-foot minimum cutback on all sides except the edge of the pavement.
- New utility cuts will be milled and paved to any existing utility cut or damaged pavement within 10-feet. If existing cut or damaged pavement is less than 10-feet in length, the existing cut or damaged pavement shall also be milled and paved.
- Asphalt repair adjacent to curb and gutter along a roadway greater than 24-inches shall have full lane width paving.
- Any disturbed pavement markings must be restored to current SCDOT standards.
- Diagonal repairs will be required to be squared off, milled and paved.
- The permittee shall be responsible for repairing all damage to the street resulting from cutting the pavement and/or excavation of or boring under a street.
- The repairs shall be in compliance with these guidelines and the latest edition of the South Carolina Department of Transportation, Standard Specifications for Highway Construction.
- Any traffic control devices which are affected by any work done in the roadway shall be repaired or replaced in compliance with criteria set forth in the latest edition of the Manual on Uniform Traffic Control Devices for Streets and Highways (MUTCD).
- The permittee shall protect the traveling public by proper warning signs and/or signals both day and night until the street is fully repaired. Warning signs and signals shall be installed by and at the expense of the permittee and in accordance with the street closures. A permit is required from the City's Traffic and Transportation Department prior to commencing work.
- Any materials and/or equipment used as the result of utility installation will be removed from through lanes between the hours of 3:30 p.m. and 8:00 a.m. each day, unless otherwise specified by the City's Traffic and Transportation Department.
- Any roadway surface will only be cut and/or excavated as described in the permit.
- The permittee shall maintain the area of the street cut until final acceptance of the work. The permittee shall hold the City, the agencies thereof, and their officers/employees harmless from any and all loss/damage which may arise out of or be connected with the work performed under any permit issued hereunder.
- The Permittee shall guarantee to repair or replace any defective work. This guarantee is part of the permittee promise of performance. Under special circumstances, the City may require the Permittee to provide a performance bond issued by an acceptable surety company. The permittee guarantee and bond shall continue for a period of three years after the work has been finally accepted by the City.

## **5. PROTECTION OF THE CITY'S STORMWATER SYSTEM**

The permittee shall protect all stormwater system including drainage appurtenances located adjacent to the construction site. The protection measures used shall be designed to prevent the discharge of pollutants to any portion of the stormwater system.

- The permittee shall be responsible for the removal of all construction debris, dirt, trash, rock, sediment, sand or other pollutants that may accumulate in the stormwater conveyance system and stormwater appurtenances as a result of construction activities associated with a permit.



- No person shall cause the impediment of stormwater flow in the flow line of the curb and gutter. The Permittee shall prevent sediment, debris, and all other pollutants from entering the stormwater system during all phases of construction.
- The cleaning of concrete delivery truck chutes or other equipment is prohibited at the job site.
- The permittee shall protect all stormwater facilities adjacent to any location where pavement cutting operations involving wheel cutting, saw cutting or abrasive water jet cutting are to take place.
- The permittee shall remove and properly dispose of all waste products generated by said cutting operations on a daily basis.
- The discharge of any water contaminated by waste products from cutting operations to the storm sewer system is prohibited.
- The discharge to the storm sewer system of water used for flushing off paved surfaces is prohibited, unless measures have been taken to remove pollutants from the discharge.

## **6. CONSTRUCTIBILITY**

Replacement of aggregate base or flowable fill shall not be performed until the trench is inspected and approved by a representative of the Engineering Division.

- At the completion of the installation of the aggregate base or flowable fill, the Engineering Division shall be requested to inspect the backfill. After acceptance of the backfill, the asphalt pavement can be applied.
- The work performed shall be free from workmanship defects for a period of one (1) year after date of acceptance by the Engineering Division.
- Existing pavements, bases, curbs/gutters and sidewalks shall be cut and brought to a neat line by use of an air hammer, saw or other suitable equipment. Expansion joints removed shall be replaced.

## **7. USE OF TRENCHLESS TECHNOLOGY**

Trenchless technology methods may be used where applicable and as approved by the Engineering Division.

- A subsoil investigation shall be performed to properly determine the subsoil conditions and to choose a desirable trenchless method that will not disrupt the integrity or surface elevation within the City's right-of-way. The Engineering Division may require other information or justification on the methods proposed or the permittee ability in order to perform the work.
- Any and all surface heave or settlement, or related problems caused by the trenchless method, shall be corrected by the permittee at his expense, to the satisfaction of the Manager or Designee. The methods of concerns include, but are not limited to; pushing conduit or reaming and back pulling conduit through pilot bore holes of any size. Any annular region or other cavity remaining between the subgrade and the conduit or utility shall be pressure grouted to the satisfaction of the Engineering Division, prior to backfilling the bore pits.
- All drilling fluids shall be removed and disposed of properly. All entrance and exit bore pits and other areas used shall be cleaned of all objectionable material and properly



backfilled according to industry standards. All such reclaimed areas shall be restored to original contour, shape and use.

## 8. USE OF STEEL PLATES

When backfill operations of an excavation in the traveled way, whether transverse or longitudinal, cannot be properly completed within a work day, steel plate bridging will be required to preserve unobstructed traffic flow in City streets and roadways. In such instances the City's Steel Plate Requirements Used in Connection with Roadway Utility Excavations, dated April 2013 apply. These requirements can be found at:

<http://www.charleston-sc.gov/DocumentCenter/View/1595>

## 9. UTILITY CUT REPAIR AT INTERSECTIONS

The following figures show the acceptable methods for making utility cut repairs in roadway intersections.

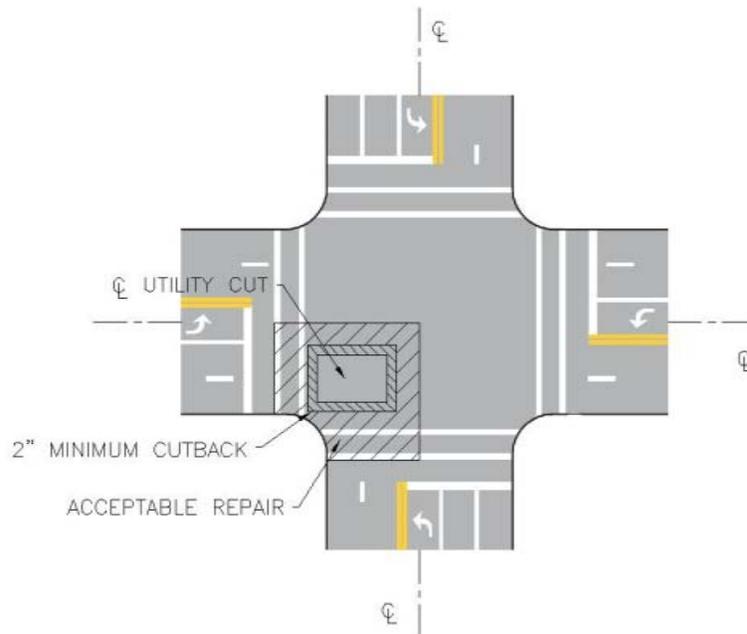


Figure 1: Utility contained in one quarter of intersection.

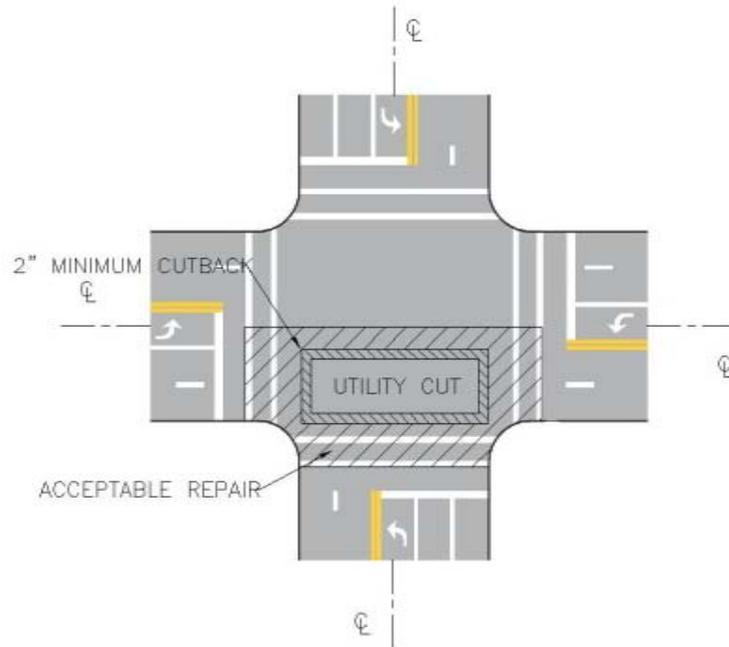


Figure 2: Utility cut contained in one half of intersection.

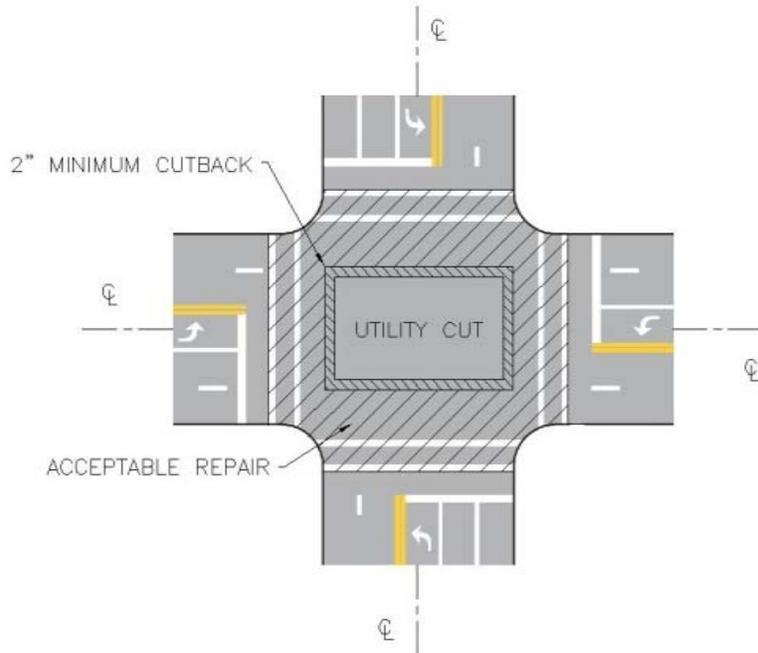


FIGURE 3: Utility cut contained more than one half of intersection.

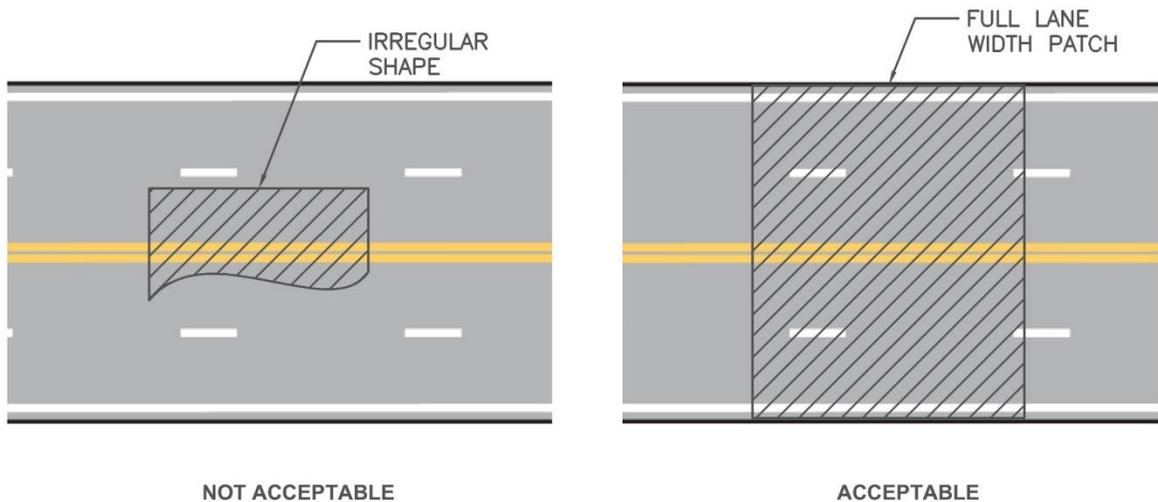


## 10. REPAIR EXAMPLES

Some examples of repair methods that are not acceptable and the corresponding acceptable method are provided in the following figures:

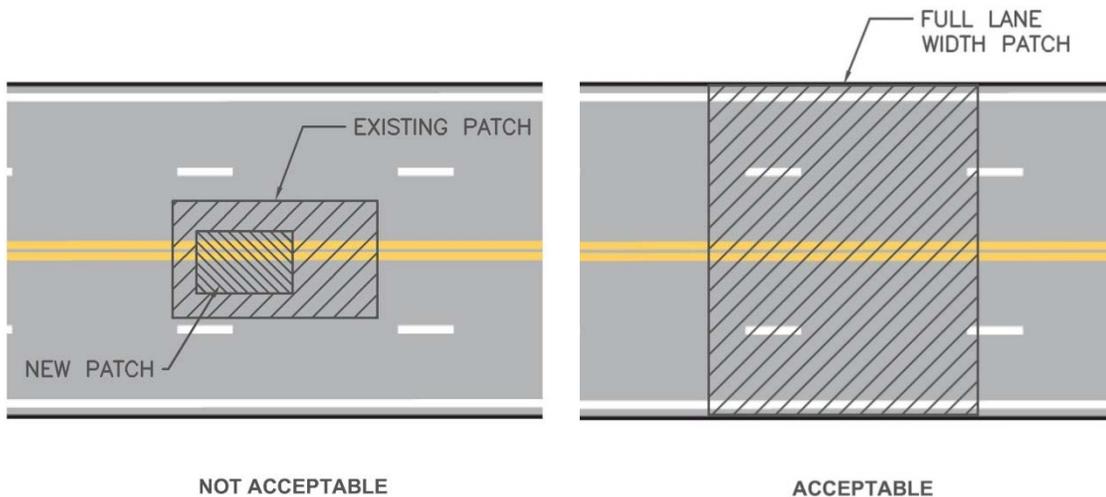
### Example 1

Existing pavements should be removed to clean, straight lines parallel and perpendicular to the flow of traffic. Do not construct patches with angled sides and irregular shapes. All repairs should be full lane width.



### Example 2

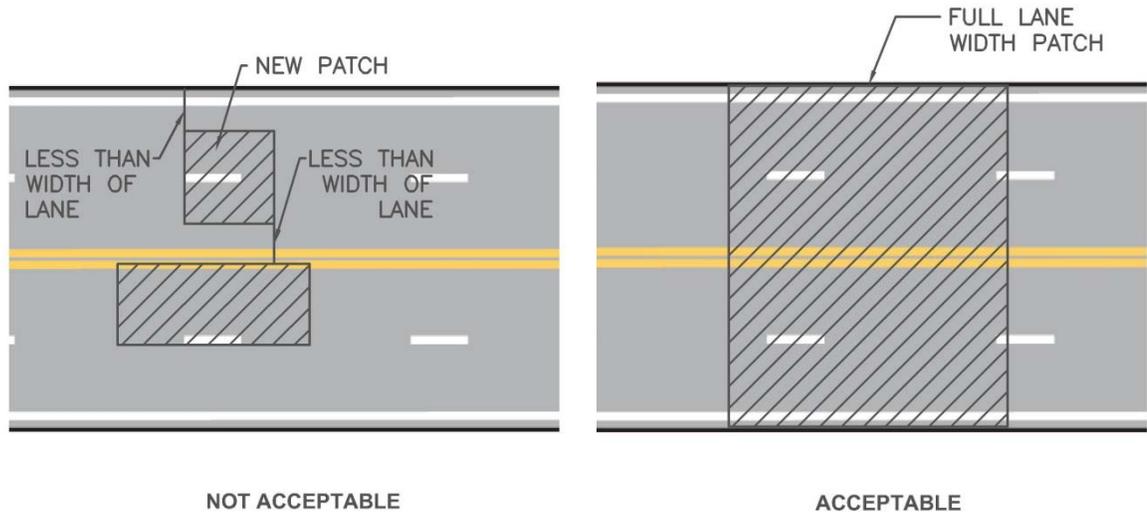
Avoid patches within existing patches. If this cannot be avoided, make the boundaries of the patches coincide. All repairs should be full lane width.





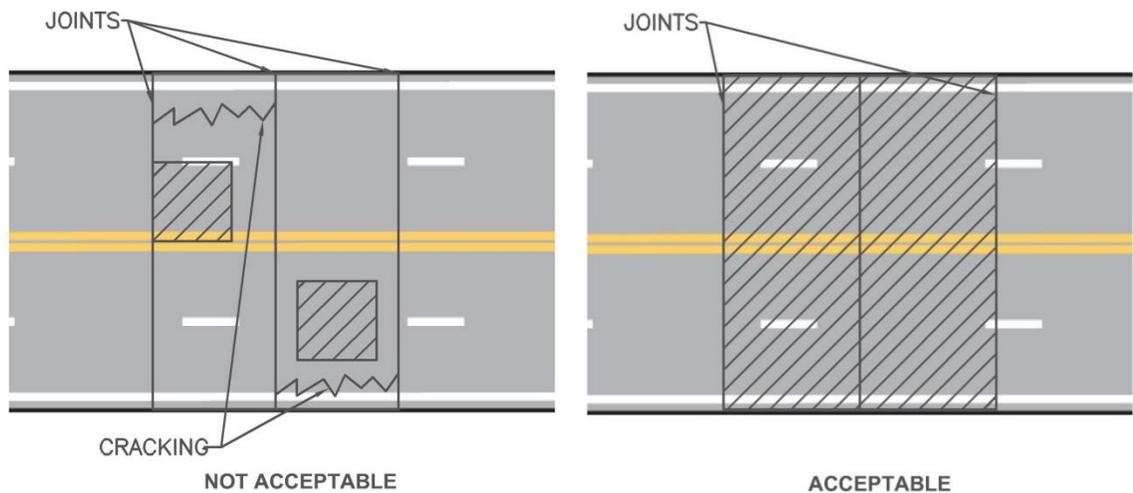
### Example 3

Do not leave strips of pavement less than one-half lane in width from the edge of the new patch to the edge of an existing patch or the lip of the gutter.



### Example 4

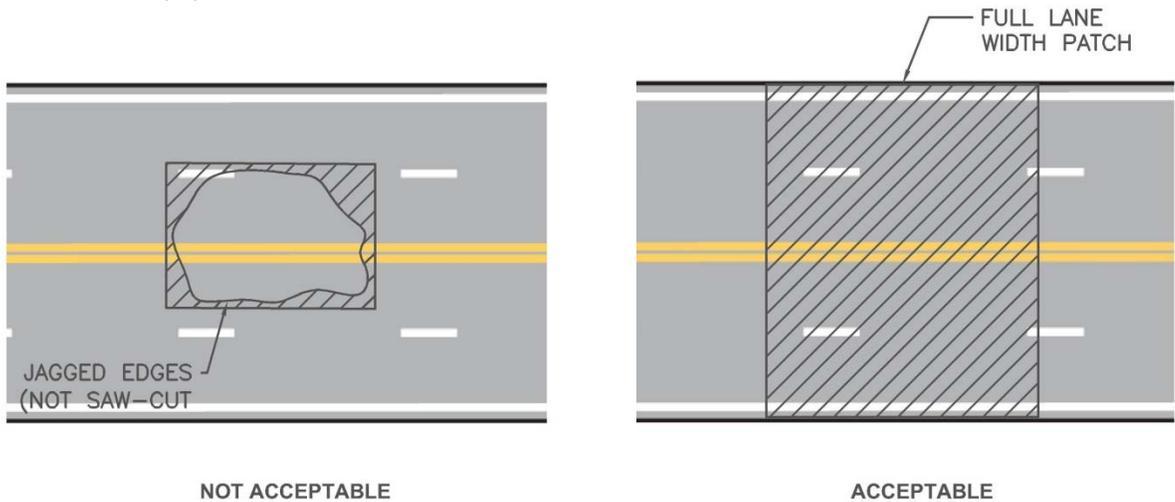
In concrete pavements, remove sections to existing joints, or new saw cut joints at mid-slab, that is in good repair. In damaged concrete, the limits of removal should be determined in the field by a representative of the Engineering Division.





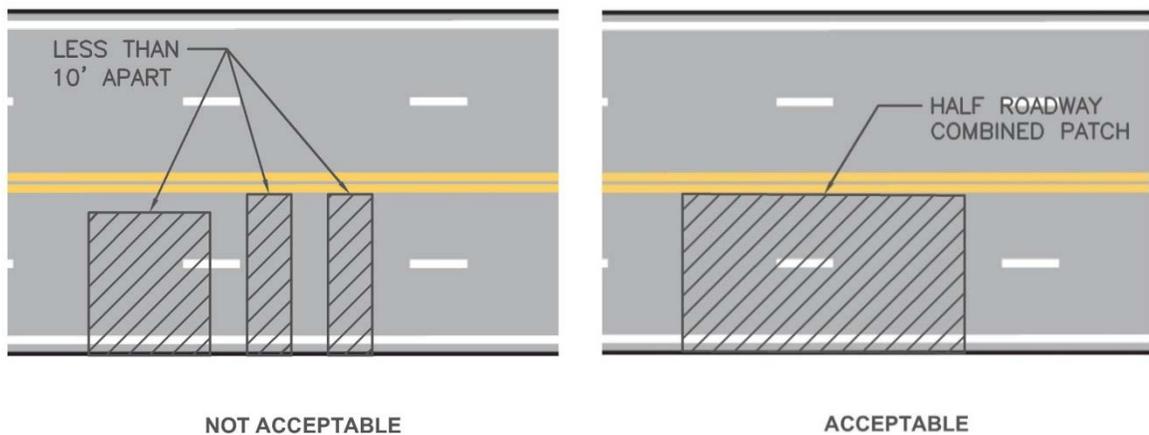
### Example 5

Asphalt and concrete pavements should be removed by saw cutting or grinding. Avoid breaking away the edges of the existing pavement or damaging the remaining pavement with heavy construction equipment.



### Example 6

In the case of a series of patches or patches for service lines off a main trench, repair the pavement over the patches by grinding and overlay when the spacing between the patches is less than 10 feet.

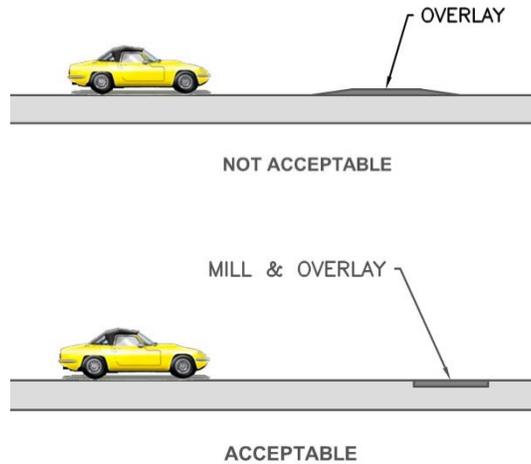


### Example 7

Completed street repairs should have rideability at least as good as, if not better than, the pavement prior to the repairs. A driver may be able to see a street repair, but in the case of a quality repair, should not be able to "feel" it in normal driving. A patch should provide a smooth ride with smooth transitions on and off the repair and all joints should be located outside the

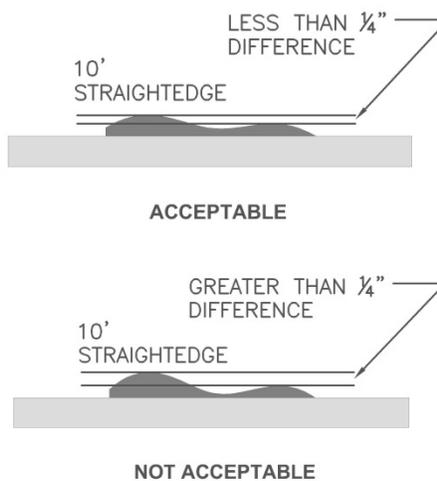


wheel path. Overlays should be placed by first removing the existing pavement to the desired depth by grinding or milling, and then placing the pavement flush with the adjacent surfaces. Overlays with feathered edges are not acceptable.



### Example 8

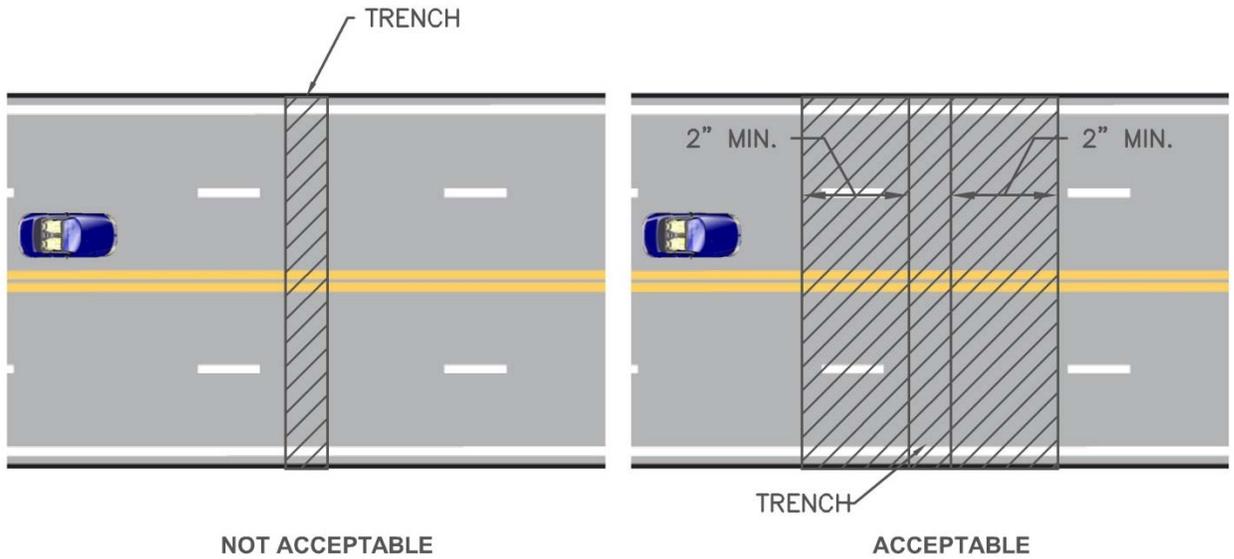
Surface tolerances for street repairs should meet the standard for new construction. That is, the finished surface of the street repair should be tested with a 10 foot straightedge parallel to the centerline or perpendicular across joints. Variations measured from the testing face of the straightedge to the surface of the street repair should not exceed  $\frac{1}{4}$  inch.





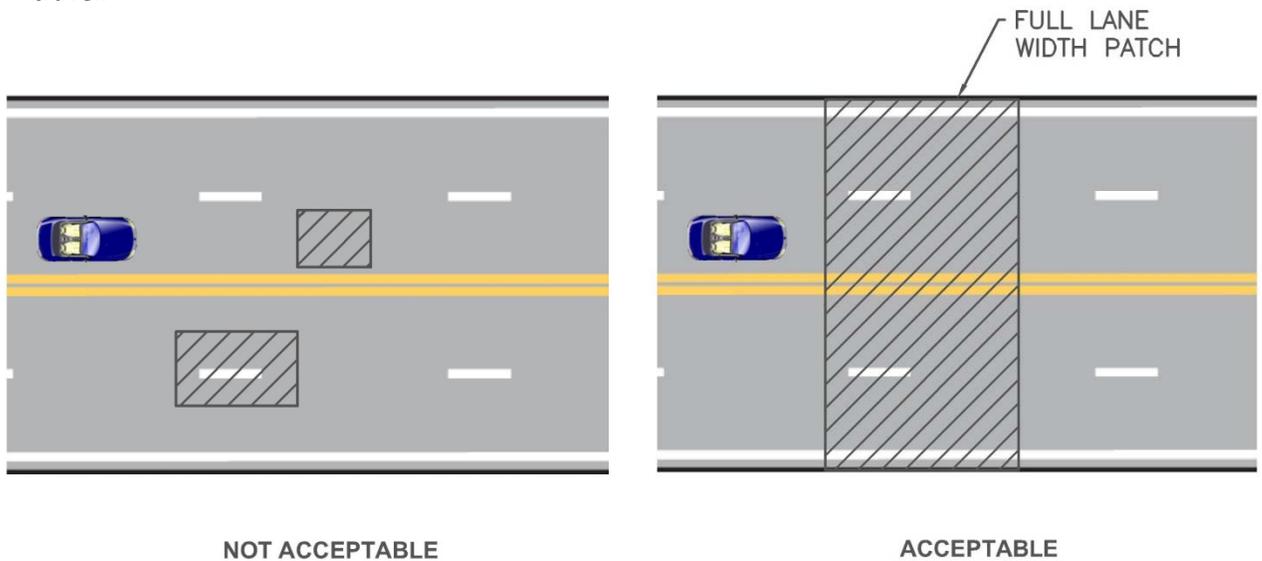
### Example 9

Transverse patches on arterial and collector streets shall be overlaid across the entire street width for a distance of two 2 feet minimum on all sides of the trench using the City’s typical utility ROW cut detail (T-Patch) shown at the end of these guidelines.



### Example 10

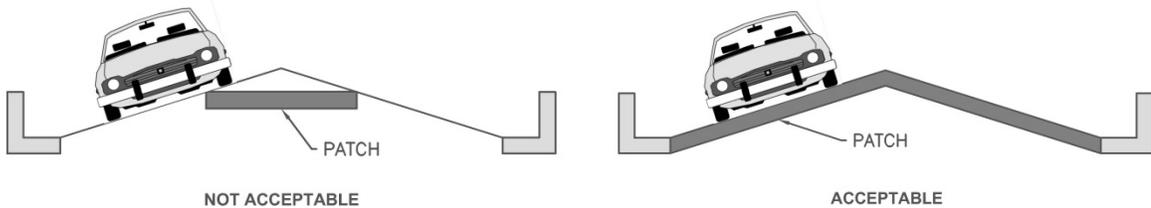
Do not allow the edges of patches to fall in existing wheel paths. The edges of patches parallel to the direction of traffic shall be limited to the boundaries of lanes or to the centerline of travel.





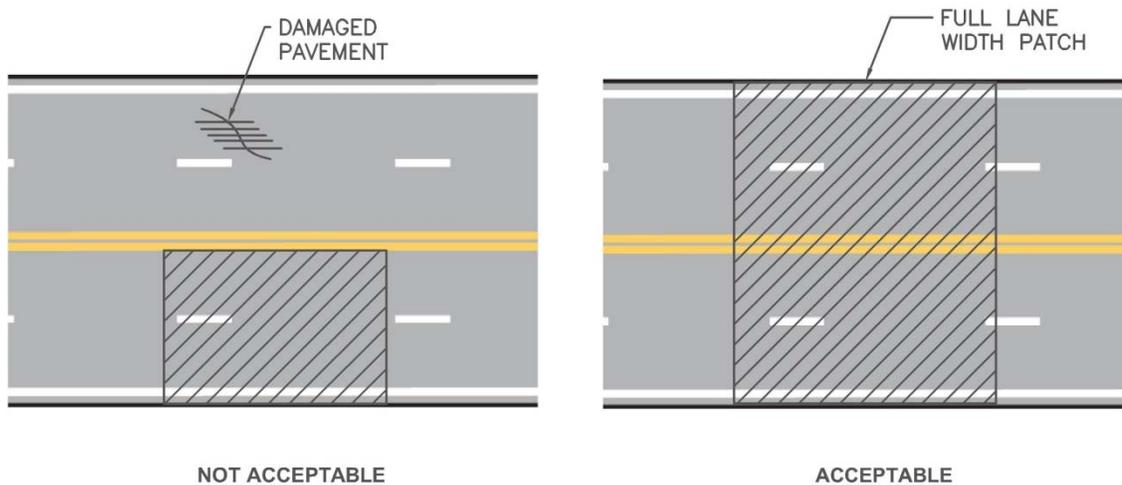
### Example 11

Patches should have a smooth longitudinal grade consistent with the existing roadway. Patches should also have a cross slope or cross section consistent with the design of the existing roadway.



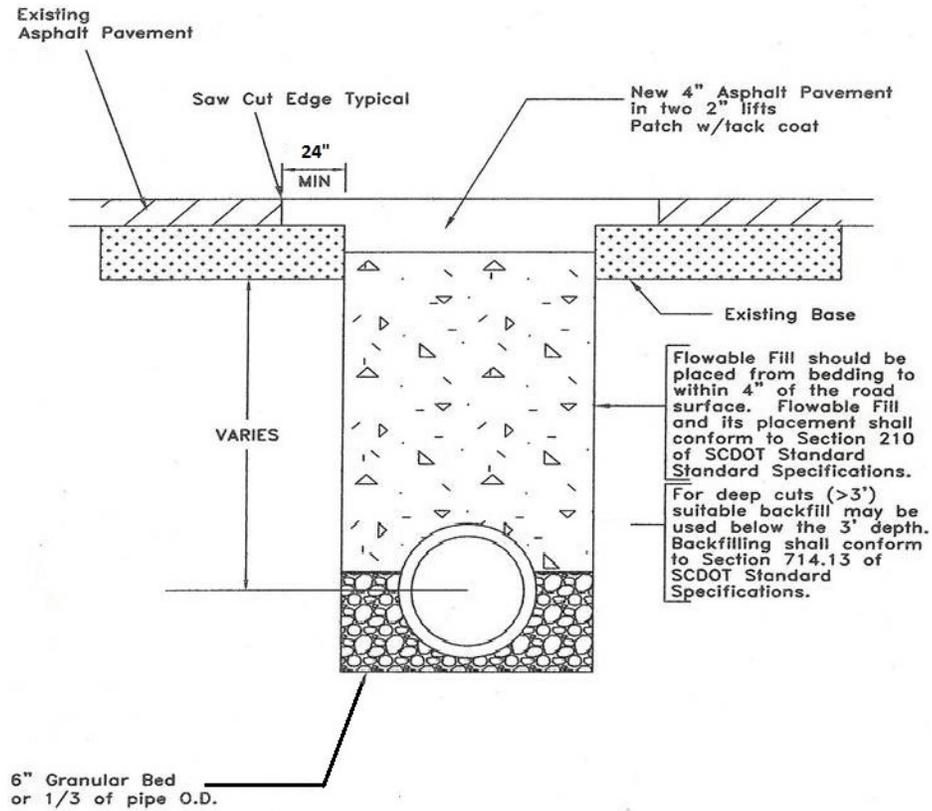
### Example 12

When the proposed excavation falls within 10 feet of a section of pavement damaged during the utility repair, the failed area shall be removed to sound pavement and patched. Scarring, gouging, or other damaged pavement adjacent to a patch shall be removed and the pavement repaired to the satisfaction of the Engineering Division.





### Typical Utility ROW Cut Detail (T-Patch)



NOTE: PRIOR TO PLACING THE ASPHALT PATCH THE EXISTING PAVEMENT MUST BE SAW CUT NEATLY AT A MINIMUM OF 24" BEYOND THE DISTURBANCE CAUSED BY TRENCHING.

TYPICAL UTILITY ROW CUT



## References

- City of Dallas Department of Public Works and Transportation. (2003, October). *City of Dallas Department of Public Works and Transportation*. Retrieved October 8, 2014, from City of Dallas: <http://www.dallascityhall.com/pdf/Streets/CutManualOct2003.pdf>
- E. Marshall Pollock, Q. (2009). Potholing Without Potholes: A Core Strategy for Utility Cut Repairs. *The North American Society (NASTT) (and the International Society for Trenchless Technology (ISTT) International No-Dig Show 2009*, (pp. Chapter 5, 1-10). Toronto.
- Managing Utility Cuts*. (1997). American Public Works Association.
- Metro Government of Nashville & Davidson County, Tennessee*. (n.d.). Retrieved October 10, 2014, from Nashville.gov: [http://mpw.nashville.gov/IMS/Paving/Documents/Appendix\\_d.pdf](http://mpw.nashville.gov/IMS/Paving/Documents/Appendix_d.pdf)
- Office of the Manager. (1998, June 23). *Denver Department of Public Works (DPW)*. Retrieved October 14, 2014, from City and County of Denver: <https://www.denvergov.org/Portals/705/documents/streetcuts.PDF>