

**PAVEMENT CUT
AND
REPAIR STANDARDS
MANUAL**

**Department of Public Works
and Transportation**



City of Dallas

October 2003

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Preface

The action by the Dallas City Council on January 24, 2001, to approve an amendment to Chapter 43 of the Dallas City Code, created a much-needed comprehensive right-of-way management ordinance for Dallas. It is the desire of the City of Dallas to develop a balance between the need to service its citizens with essential utilities and new technology and the preservation of street infrastructure. The new ordinance incorporates many positive changes reflecting the interest of the city to provide safe and well-maintained streets.

This manual is intended to promulgate the technical criteria and details necessary to implement the provisions of the Dallas City Code, Chapter 43, Article VIII, Certain Uses of Public Right-of-Way, a copy of which is included in this document. Section 43-136 (a) of the ordinance states that the director is authorized to administer and enforce the provisions of the article, and to promulgate regulations, including but not limited to engineering, technical, and other criteria and standards, to aid in the administration and enforcement of the article.

It is the intent of the Public Works and Transportation Department (PWT), to keep this manual current as to the latest materials, methods, and techniques that are acceptable for pavement cut and repair, and for any other changes or additions that may be made. The latest update will be noted on the face of the document. However, the permittee shall be ultimately responsible for ensuring that the current standards are being followed.

Copies of the manual may be purchased from the Office of the Director of Public Works and Transportation, Public Works and Transportation Department, 320 E. Jefferson Boulevard, Room 102, Dallas, Texas 75203.

Acknowledgments

The Public Works and Transportation Department would like to thank all of its employees who helped in the development of this manual and with the ordinance amendment process especially David C. Dybala, P.E., Director, Elizabeth Fernandez, P.E., Assistant Director, Ben Cernosek, P.E., Sophia Harvey, P.E., and Rick James.

A special thanks to Assistant City Attorneys Janis Everhart, Larry Scalf, Don Knight and Lisa Christopherson for their work on this project.

The Public Works and Transportation Department would also like to thank the Street Services Department and the Water Utilities Department for their assistance in this process, especially Jim Wood, Director of Street Services, Forest Turner, Tony De La Cruz, Chris Agnew, P.E., Terrace Stewart, P.E., Director of Water Utilities, Bob Johnson, P.E., and Randy Nelson, P.E.

In addition, thanks to all of the Public Service Providers and their representatives who participated in the meetings and provided comments for their help and support in the development of the new ordinance and this manual.

PART 1

Pavement Cut and Repair Standards

I. INTRODUCTION

The purpose of this manual is to provide the standards and process details for implementation of CHAPTER 43, STREETS AND SIDEWALKS, ARTICLE VIII “Certain Uses of Public Right-of-Way” of the DALLAS CITY CODE. A copy of this ordinance is attached as Part 2 of this manual and shall govern all pavement cuts, repairs and excavations in street and alley rights-of-way and utility access easements. The ultimate goal of this manual is to maintain a high standard for the restoration of public street rights-of-way and easements, to avoid damage to other utilities or improvements and to provide safety and convenience for the public, and is not intended to interfere with the utility=s type of construction or equipment used.

The following is a list of other goals that should be utilized:

1. Maximize protection of the public and work force during construction;
2. Minimize inconvenience and disruption to adjacent landowners;
3. Provide quality pavement replacements on pavement cuts;
4. Minimize future maintenance cost to the City;
5. Minimize time of lane closures or restrictions and interruption of traffic flow.

II. STREET EXCAVATION AND INSTALLATIONS

1. The removal and replacement of portions of existing concrete pavement, drives, slabs, sidewalks, etc., shall require breakout grooves to be sawed by the use of an approved power driven concrete saw in accordance with this specification and details shown on the plans or as directed by the director.

Locations shown on the plans are indicative only of the need for grooves, and where designated locations coincide with or fall within three (3) feet of the present location of either dummy joints, construction joints, or expansion joints, breakout shall be to existing joints; in this case, there will be no necessity for cutting additional grooves. Sawed breakout grooves shall be cut perpendicular to the surface of the pavement and shall be sawed full-depth to form a neat breakout line in the concrete pavement when the pavement is removed. The use of breakout grooves sawed to a minimum depth of one and one-half (1.5) inches will be allowed in the alternative to full depth only upon the approval of the Director of Public Works and Transportation.

Removal and replacement of sidewalks shall be to the nearest existing joint not damaged by the construction. Street and alley pavement removals shall have no horizontal dimension less than three (3) feet and in concrete pavements shall not leave any existing portion of pavement in place less than three (3) feet as measured to the nearest joint or edge of pavement except that for curb and gutter, a gutter of at least 12 inches may remain, provided that the curb and gutter is not damaged by the construction activity.

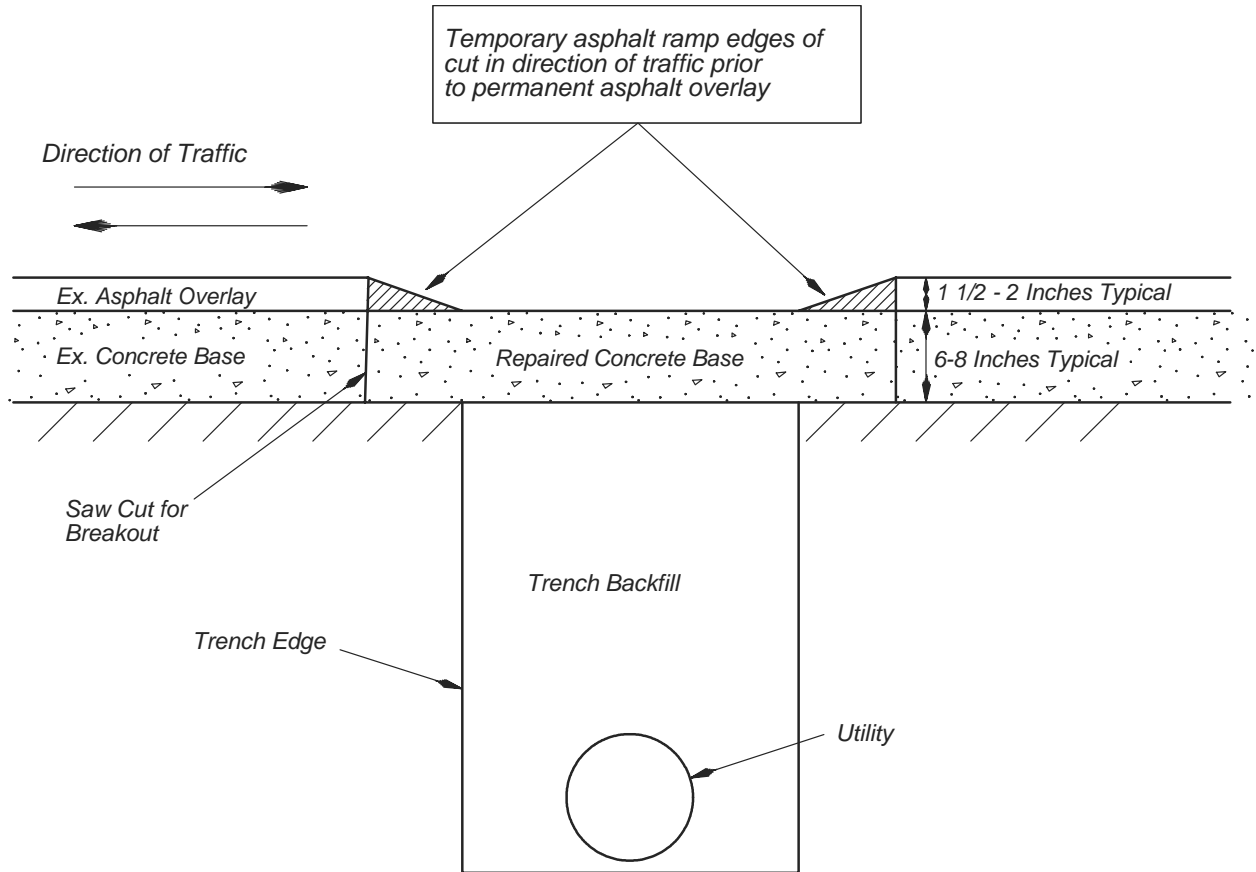
2. Excavation in city street or alley pavements should begin with an air-hammer shovel, a pavement breaker, or other equipment that will not damage the pavement outside an approximate width of the ditch prior to beginning trenching operations.

If the excavation is to pass under an existing curb in which there is no dummy/expansion joint, the utility/contractor may saw cut a smooth line one (1) foot beyond each side of the disturbed base. If no damage to curb is evident to the City Inspector, the utility/contractor may pump concrete under curb and gutter for cuts less than one (1) foot wide. The City Inspector, prior to concrete being placed under existing curb and gutter, will make this determination.

3. The following additional requirements shall govern installation:
 - a. No portion of pipe, conduit, line or other conveyance of utility service shall be placed less than 12 inches below the bottom of the existing pavement base or subgrade. All lines, pipes, conduits, etc. shall be marked with standard marker tape (Terra-Tape by Reef Industries, 1-800-231-2417, or equal).
 - b. All excavations shall be backfilled with acceptable materials in the required lifts and to the required densities provided in the Backfill Operations section of this manual.

- c. All subgrades and pavements excavated or damaged by the repair activity shall be restored as provided in the Pavement Repairs and Restoration Details sections of this manual.
- d. The responsible person shall provide a landscape protection plan during the term of the construction to minimize damage to existing landscape and facilities. All damaged trees, shrubs or ground covers shall be restored or replaced. Replaced ground cover and seeded areas shall be fertilized and watered and maintained as required until lawn areas are reestablished. Irrigation systems shall be repaired to pre-construction condition and extent.
- e. The responsible person shall repair or replace all damaged or removed traffic control devices in accordance with City standard to the pre-construction condition and extent as required by the engineer.
- f. In the event that it is necessary to place a temporary surface on any cut opening, the temporary surface shall be composed of hot mix asphalt or cold mix paving materials. Gravel or flexbase surface material shall not be used as a temporary surface on any cut unless the preexisting street surface was gravel or flexbase. Hot mix asphalt may be required by the inspector for certain repairs where deemed necessary to maintain good driving conditions. Temporary surfaces shall be adequately compacted to prevent deterioration of repair during the temporary period.
- g. If the cut is to be covered, the contractor shall use steel plates of sufficient strength and thickness to support all traffic. The plates must be sufficiently secured in place so as not to become dislodged or in any way cause a hazard to traffic. Asphalt transitions shall be placed as required to provide an acceptably smooth riding surface.
- h. When a cut to a street with an asphalt overlay is left open to traffic after the base repairs are complete and while waiting to be “topped out” with a permanent asphalt surface, the edges of the cut overlay shall be ramped with asphalt in the direction of traffic at an angle that provides a smooth transition through the cut and shall be maintained in place until the permanent asphalt surface is placed. (See illustration next page) This shall apply only to non-residential streets.
- i. Any temporary surface that fails to provide a non-deteriorating riding surface or fails to meet the requirements of these specifications shall be removed and replaced at the director’s discretion, at the responsible person’s expense.

The director must approve any exceptions to these provisions. Failure to make repairs in accordance with these standards may result in correction of the defects, by the City, with all response and repair performed at the contractor’s expense. All billing to the contractor for work performed by the City due to contractor noncompliance with this manual, and the ordinance shall be at actual City cost for materials, labor, equipment and overhead plus actual indirect costs, as determined by the director, and such cost shall be considered to reflect the actual cost for the work performed.



Cross-Section Illustration for Repair to Asphalt Street W/Concrete Base

III. JACKING, BORING, OR TUNNELING

Where pipe is to be installed under a roadway structure using jacking, boring, directional drilling, or tunneling methods, the construction will be in compliance with the provisions of Item 6.4 “Jacking, Boring, or Tunneling” of the Standard Specifications for Public Works Construction and the Department of Public Works addendum thereto. The following will be a guide of procedure for boring operations:

1. Prior to scheduled boring operations, plans for the proposed construction must be submitted to the City for approval.
2. All water mains must be located in advance of construction by potholing when crossing over or under the water mains or where the water main is running in the same direction and is within five (5) feet of the proposed facility.
3. Construction shall be made in such a manner that will minimize interference with vehicular traffic and shall not weaken or damage the existing street.
 - a. The location of the boring pits shall be of sufficient distance from the roadway to prevent undermining of the curb, gutter or shoulder section (normally 5 feet).
 - b. The pit shall be dug to a depth sufficient to maintain a minimum boring depth of 24 inches below the traffic surface. Jetting types of boring equipment will not be allowed.
 - c. Over cutting in excess of approximately two (2) inches shall be remedied by pressure grouting the entire length of the installation.
 - d. The pits or trenches excavated to facilitate this operation shall be backfilled immediately after work has been completed. The backfill shall be compacted to a density equal to the requirement for installation of City storm drainage facilities as specified on the City’s Standard Construction Details. During construction operations, barricades, flashers, signs and other appropriate traffic control devices to safeguard traffic and pedestrians shall be furnished and maintained, in accordance with the 1980 Texas Manual on Uniform Traffic Control Devices, as currently amended until the job has been completed, at which time they shall be removed.
4. The contractor shall be able to locate the bore head at all times.

IV. BACKFILL OPERATIONS

The following requirements pertain to backfill operations:

1. The director shall have the authority to direct any entity or contractor to use flowable fill to backfill a trench or excavation in the public right-of-way in the interest of preserving the public convenience or safety.
2. All excess water and mud must be removed from the trench prior to backfilling. Any backfill placed during a rainy period or at other times where excess water cannot be prevented from entering the trench shall be considered temporary and must be removed as soon as weather permits. All backfills shall be compacted and surfaced with a minimum of one (1) inch cold mix or hot mix asphalt to improve traffic surface until permanent repair can be accomplished.
3. Following removal of any excess water and mud from the trench, the utility can be installed and bedded with granular material per utility requirements. The trench shall then be backfilled with selected materials from the excavation or with flowable backfill material as follows:
 - a. For all excavation and pavement cuts exceeding width and length of five (5) feet, backfill shall use select materials from the trench excavation. Excavated material used in backfilling shall be an earth free of all hard rock, stones, or boulders, having dimensions greater than six (6) inches and frozen earth, debris and roots larger than two (2) inches. Excavated material may not be used if it is water saturated. If trench excavation materials are not acceptable, then flowable backfill material shall be used for backfill as provided in this manual. In the event rock is encountered, the rock excavation can be used for backfill provided it is processed as required in this manual. During freezing weather where repairs must be made to restore or maintain service, crush stone may be used when approved by the director for backfill.

That portion of backfill, which will not support any portion of any sidewalk, driveway, or roadway, shall be placed in layers not exceeding 10 inches in depth (loose measurement) and compacted to a density comparable with the adjacent, undisturbed material.

That portion of the backfill which lies more than 12 inches below any portion of any sidewalk, driveway, alley, or roadway or other pavement shall be compacted by mechanical compaction to a density of 95% of Standard Proctor density to minus 2% to plus 4% of optimum moisture of samples of the backfill material as determined by the “maximum density optimum moisture test” as provided in ASTM designation D698. If hand pneumatic tampers are used, the backfill shall be placed in layers not exceeding three (3) inches and thoroughly tamped in place.

If heavier tampers (that is, operated by combustion engines, electric motors, or hydraulic cylinder) or mechanically driven compaction equipment are used, the thickness of the layers may be increased to a maximum of eight (8) inches provided the required density is obtained. The backfill shall be placed in uniform layers completely across the trench and compaction shall progress in an orderly and uniform manner. Utmost care must be taken in tamping in this manner to prevent damage to the conduit. All layer thicknesses shall be as measured by loose measurement.

Instead of backfilling with excavated material as provided above, the contractor may backfill the trench with flowable backfill material as provided in this manual.

- b. All pavement excavations equal to or less than five (5) feet in length or width shall be backfilled with flowable backfill material, unless the director authorizes an alternate backfill method and material.
- c. Flowable Backfill material shall meet the following requirements.

Flowable Backfill material, also called unshrinkable fill and slurry concrete, shall be a controlled density material consisting of cement and/or fly ash, sand and water meeting the requirements of high strength fast fix flowable fill or low strength fast fix flowable fill.

- 1) High strength fast fix flowable fill (H.S. Four F) shall consist of an appropriate amount of cement (with other additives as necessary) mixed wet with mortar sand to flow and fill all voids in the excavation. This fill shall develop a minimum compressive strength of 2,160 pounds per square foot (15 psi) one hour after placement, and a 28-day compressive strength within the range of 300 psi to 500 psi. The material must be such that it can be capped in one and one-half (1.5) to two (2) hours.
- 2) Low strength fast fix flowable fill (L.S. Four F) shall consist of an appropriate amount of cement (with other additives as necessary) mixed with mortar sand to flow and fill all voids in the excavation. This fill shall develop a compressive strength of 1120 pounds per square foot (7.8 psi) one hour after placement, and a 28-day compressive strength within the range of 25 to 100 psi. The material must be such that it can be capped in one and one-half (1.5) to two (2) hours.

Any materials used shall be primarily granular, with a plasticity index less than 12 and with 100% passing a 3/4" sieve.

- d. Flowable Fill Base shall be a flowable fill meeting the requirements of high strength fast fix flowable fill.
- e. The use of flooding as a means of obtaining compaction of backfill shall not be allowed on existing public streets, alleys or sidewalks.

4. In addition to the provisions above, the portion of the backfill which lies within 12 inches below any portion of any driveway or “improved” roadway shall be compacted to secure a density of not less than 98% of standard proctor density to minus 2% to plus 4% of optimum moisture of samples of the material as determined by the “maximum density optimum moisture test” ASTM designation D 698. The backfill material shall be moistened when required to obtain satisfactory moisture content and compaction. If the flowable fill method of backfill is used, the flowable fill material shall be placed to the base of the pavement.
5. The permittee will be required to provide a certified construction materials testing lab acceptable to the City of Dallas to perform the appropriate tests, to ensure quality control for the backfill and pavement construction phases, at their expense. The results from compaction tests shall be supplied to the City within three days of the backfill work completion and before pavement construction begins. The results from pavement tests shall be supplied to the City within one week of completion of the project.
6. If the backfill or pavement repairs do not meet these requirements, they shall be considered unacceptable and shall be removed and replaced. In cases where backfill or pavement repairs is unacceptable and the permittee refused to make them acceptable, the work may be accomplished by the City and all the direct and indirect costs back charged to the permittee responsible for the work.
7. The City may perform, or have performed, any material tests needed as indicated by the situations described below:
 - a. Visual inspection by the inspector shows poor quality of workmanship or materials.
 - b. Any other unusual circumstances that cause the Inspector to doubt the quality of work.

All laboratory tests or retests shall be the responsibility of the permittee doing the work, at his sole expense.
8. Compaction testing will not be required where flowable fill is used and accepted for the trench backfill.
9. Specifications for pavement testing shall meet the requirements contained in the applicable provisions of the Standard Specification for Public Works Construction – North Central Texas.

V. PAVEMENT REPAIRS

1. Pavement repairs are to be made as rapidly as is consistent with high quality workmanship and materials. Use of fast setting concrete and similar techniques is encouraged insofar as possible without sacrifice of the quality of the repair. Unless otherwise allowed by the director, excavations on thoroughfares must be filled and compacted or properly plated within 24 hours.
2. Core holes shall and utility potholing be repaired as follows:
 - a. For core holes exceeding one-foot depth, the hole shall be filled with a nonshrink grout having a compressive strength of 4500 psi after 28 days. The grout material used shall be compatible with the existing surface in color and texture and shall seal the hole to prevent the intrusion of moisture into the subgrade.
 - b. For core holes not exceeding one-foot depth, which pass into the subgrade, the subgrade shall be tamped to provide pavement support first and the hole shall be filled with the required nonshrink grouts as in no. 1 above.
 - c. Excavations for potholing to expose underground utilities shall be backfilled with HS Four F flowable fill.
 - d. On asphalt streets, hot mix fine graded surface course asphaltic concrete tamped in place shall be used in place of the non-shrink grout.
 - e. The surface of the completed repair shall have no indentions, pockets or recesses that may trap and hold water, nor have bumps or high places but the completed surface shall match the grade of the existing pavement surface.
 - f. Repair of cored holes 12-inches in diameter or less for subsurface geotechnical investigation, materials testing, or utility relocations are not subject to the repair extent standards, but shall be repaired as noted above.
 - g. All excavations considered destructive or disturbing to the surrounding pavement such as the use of a backhoe to break the pavement will be subject to the repair extent standards no matter the reason for the excavation.
3. After placement of temporary repairs is completed, the utility/contractor shall clean and remove all debris and barricades from the area, and maintain the pavement cut until permanent repairs are made. Final pavement repairs shall be made by the utility/contractor within a 14 calendar day period after temporary repairs are made.

All permanent patches and repairs shall be appropriate to the surface. For example, reinforced concrete pavement repairs shall be required for streets with concrete surfaces, reinforced concrete base with asphalt hot mix overlay pavement repairs shall be required for “overlaid” concrete streets, etc. In no case shall there be an asphalt repair in a concrete street or a concrete repair in an asphalt street.

4. Replacement of Curb and Gutter, Sidewalk and Alleys shall be as follows:

Construction of support base and curb and gutter, sidewalk and alley pavement shall be as required by the Standard Specifications for Public Works Construction, the Department of Public Works and Transportation Addendum to the Standard Specifications and the Department of Public Works and Transportation Standard Construction Details File 251D-1.

Class “Hand Finish” concrete shall be used to replace cuts in concrete alley pavement and “Sidewalks, Separate Curb and Gutter, and Median Pavement” class of concrete shall be used to replace curb and gutter, sidewalk and median concrete pavement.

Alley pavements shall be restored using like materials in accordance with the pavement details provided in this manual.

5. All materials used to replace pavement base and pavement shall be in accordance with the requirements of this manual, the Standard Specifications for Public Works Construction, the City Addendums thereto, and the City Standard Construction Details, File 251D-1.

VI. RESTORATION DETAILS

The size of the street repair area will typically always be larger than the size of the excavated area. Parts A. and B. of this section provide the detail and specifications for the horizontal dimensions of the street repair area. Part C. provides information regarding the street repair including the backfill and pavement specifications by showing the cross-section detail for the most typical cases that may be encountered in the field.

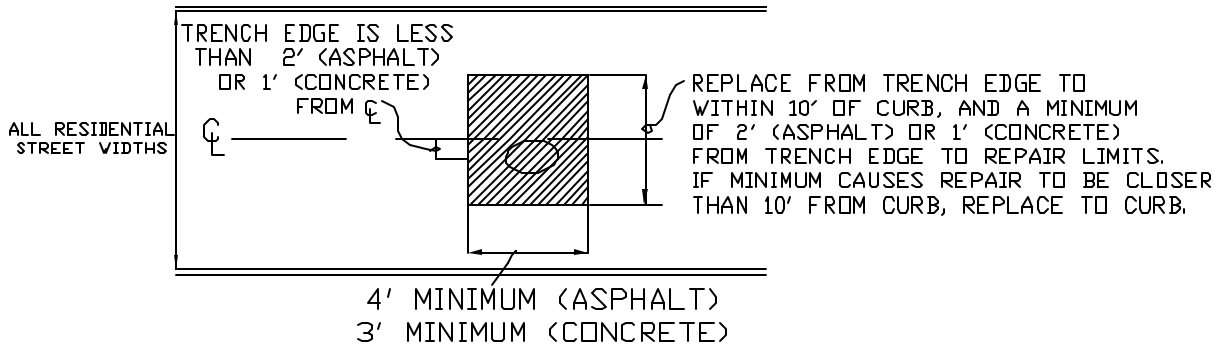
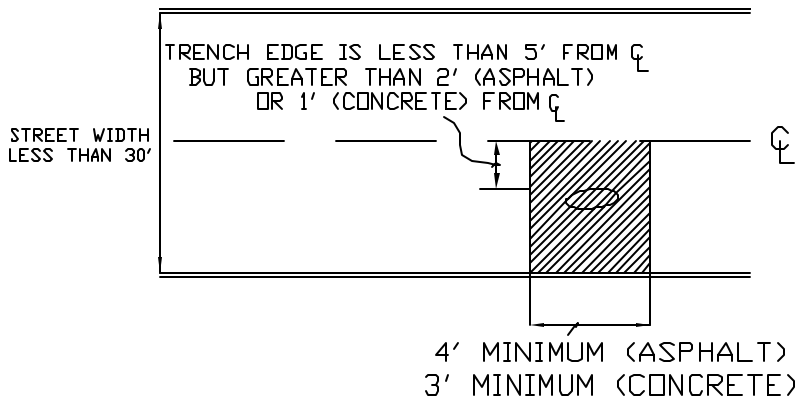
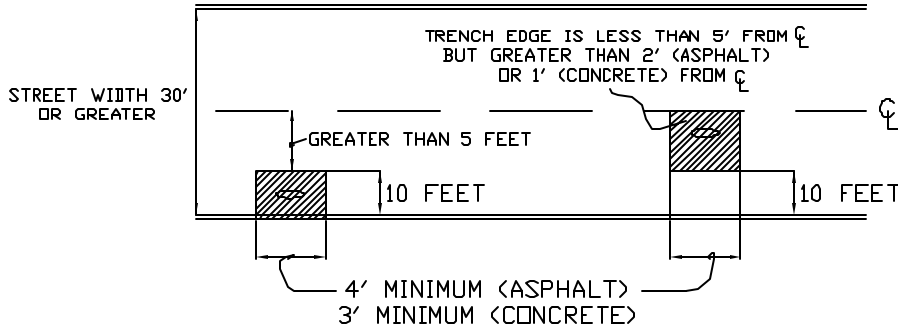
The street repair area specifications are shown by variable width residential street and by multiple lane streets. This should cover most typical cases encountered in the field. If any questions should arise regarding the size of the street repair area, contact the Cut Control inspection section of the Department of Public Works and Transportation for a final determination.

A. PAVEMENT CUT AND REPAIR EXTENT – RESIDENTIAL

The following detail entitled “Pavement Cut and Repair Extent – Residential, Standard Drawing 3070C” shall be used to determine the extent to which pavement repairs are required to be made when repairing an excavation to a street that is older than 5 years. This standard applies to all excavation street repairs on residential streets not covered by section VI. Restoration Details for Newly Constructed, Reconstructed, or Resurfaced Streets addressed in this manual.

GENERAL NOTES

1. REMOVE AND REPLACE A MINIMUM OF 4' (ASPHALT) OR 3' (CONCRETE) LONGITUDINAL, OR 2' (ASPHALT) 1' (CONCRETE) FROM THE EDGE OF THE TRENCH, WHICHEVER IS GREATER
2. IF WITHIN 3' OF AN EXISTING JOINT, THEN REMOVE TO THE EXISTING JOINT
3. MULTIPLE LOCATIONS ARE TO BE A MINIMUM OF 10' APART FROM EDGE OF REPAIR TO EDGE OF REPAIR, IF LESS THAN 10' APART, A CONTINUOUS SECTION MUST BE REPLACED.
4. A GUTTER OF AT LEAST 12" MAY REMAIN, PROVIDED THAT THE CURB AND GUTTER IS NOT DAMAGED BY THE CONSTRUCTION ACTIVITY.
5. EXACT PAVEMENT REMOVAL LOCATIONS TO BE APPROVED BY OWNER PRIOR TO CONSTRUCTION.



VARIABLE WIDTH
RESIDENTIAL STREET

PAVEMENT CUT AND REPAIR

EXTENT - RESIDENTIAL

North Central Texas Council of Governments



STANDARD SPECIFICATION REFERENCE

402

DATE

DEC '02

STANDARD DRAWING NO.

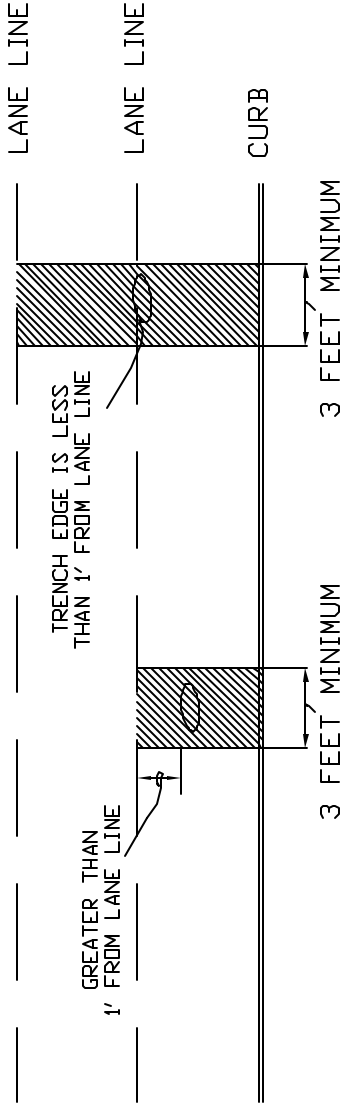
3070C

B. PAVEMENT CUT AND REPAIR EXTENT – MULTIPLE LANE STREETS

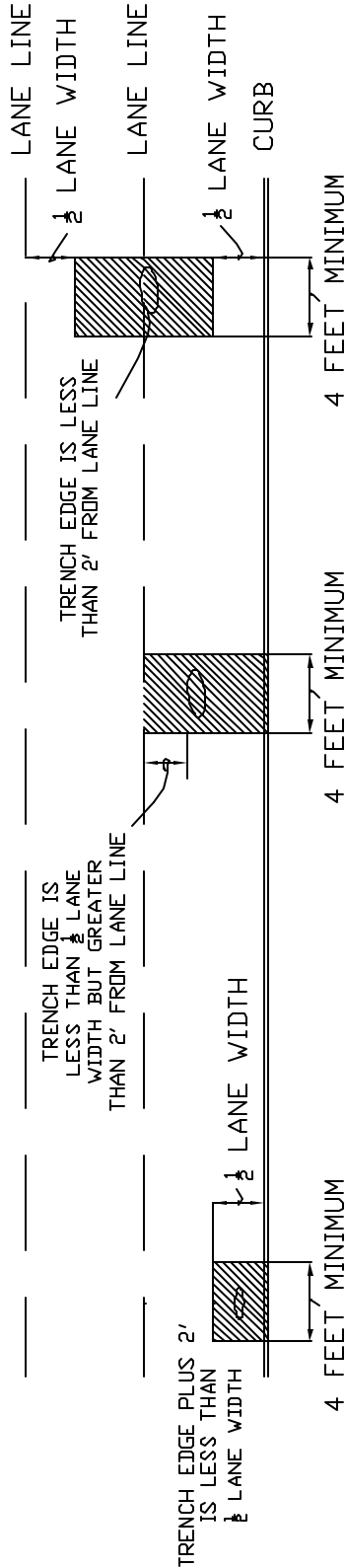
The following detail entitled “Pavement Cut and Repair Extent – Multiple Lanes, Standard Drawing 3070D” shall be used to determine the extent to which pavement repairs are required to be made when repairing an excavation to a street that is older than 5 years. This standard applies to all excavation street repairs on multiple lane streets not covered by section VI. Restoration Details for Newly Constructed, Reconstructed, or Resurfaced Streets addressed in this manual.

GENERAL NOTES

1. REMOVE AND REPLACE A MINIMUM OF 3" (CONCRETE) OR 4" (ASPHALT) LONGITUDINAL, OR 1" (CONCRETE) OR 2" (ASPHALT) FROM THE EDGE OF THE TRENCH, WHICHEVER IS GREATER
2. IF WITHIN 3' OF AN EXISTING JOINT, THEN REMOVE TO THE EXISTING JOINT
3. MULTIPLE LOCATIONS ARE TO BE A MINIMUM OF 10' APART FROM EDGE OF REPAIR TO EDGE OF REPAIR. IF LESS THAN 10' APART, A CONTINUOUS SECTION MUST BE REPLACED.
4. A GUTTER OF AT LEAST 12" MAY REMAIN, PROVIDED THAT THE CURB AND GUTTER IS NOT DAMAGED BY THE CONSTRUCTION ACTIVITY.
5. EXACT PAVEMENT REMOVAL LOCATIONS TO BE APPROVED BY OWNER PRIOR TO CONSTRUCTION.



VARIABLE WIDTH CONCRETE STREET WITH MULTIPLE LANES



VARIABLE WIDTH ASPHALT STREET WITH MULTIPLE LANES

STANDARD DRAWING NO.
3070D

PAVEMENT CUT AND REPAIR
EXTENT - MULTIPLE LANES



STANDARD SPECIFICATION REFERENCE
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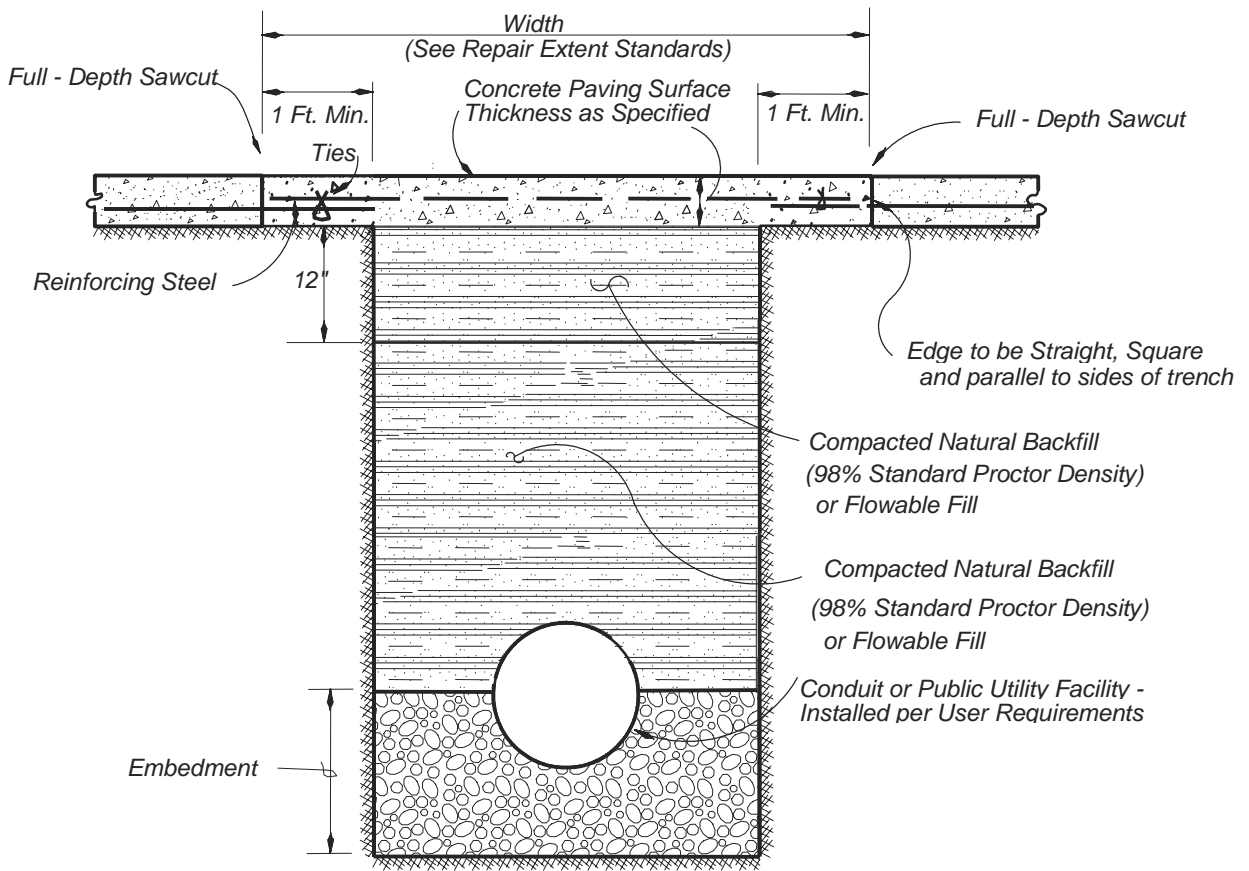
C. TYPICAL CROSS-SECTIONS

1. Replacing Concrete Pavement

The existing pavement shall be removed in accordance with this manual to a line at least twelve (12) inches back of the firm banks of the trench. The backfill shall be brought up to the elevation of the bottom of the existing pavement and satisfactorily densified in accordance with section IV of this manual. Reinforcing bars shall be replaced with like-size bars lapping 30 diameters with a minimum of 18 inches on splices. If splices cannot be made with the existing pavement reinforcing bars or if there are no existing reinforcing bars apparent, the existing concrete pavement shall be drilled 12 inches deep and like size dowel bars with a minimum length of 30 inches shall be epoxy grouted into the existing slab 12 inches deep on 24-inch centers along the sides of the exposed existing concrete pavement cut and lapped with the new reinforcing bars. If no existing reinforcing bars are apparent, the spacing and bar size of the new reinforcing bars shall be #4 bars on 24-inch centers. The concrete pavement shall be replaced using the appropriate class of concrete. Classes of concrete shall be as provided in Item 5.8.1.1 of the Department of Public Works Addendum to the Standard Specifications. All concrete construction specified herein shall be protected from vehicular traffic, including vehicles of the contractor, until the concrete is not less than 7 days old unless quick set concrete materials are approved for use. A compressive strength of at least 3000 psi shall be achieved before vehicular traffic is allowed on the new pavements. "Sidewalks, Separate Curb and Gutter, and four (4) inch Median Pavement" class of concrete shall be used to replace these concrete pavements. "Hand Finish" class of concrete shall be used to replace street, alley and driveway pavement. The pavements and structures provided shall match the finish and thickness of the existing pavements and structures, but street and alley pavements shall be not less than the following:

- Six (6) inches for local streets, alleys and driveways. (Local streets are typically residential streets with a width not exceeding 26 feet and not on a bus route.)
- Eight (8) inches for residential collectors and commercial driveways.
- Nine (9) inches for thoroughfares and collectors.
- Ten (10) inches for streets located in the Central Business District.

See Detail 1 - Replacing Concrete Pavement below:



Replacing Concrete Pavement

2. Replacing Asphaltic Concrete Pavement with Concrete Base

The existing pavement shall be removed to a neat line at least 12 inches back of the firm banks of the trench. The backfill shall be brought up to the bottom of the pavement and satisfactorily densified in accordance with section IV of this manual.

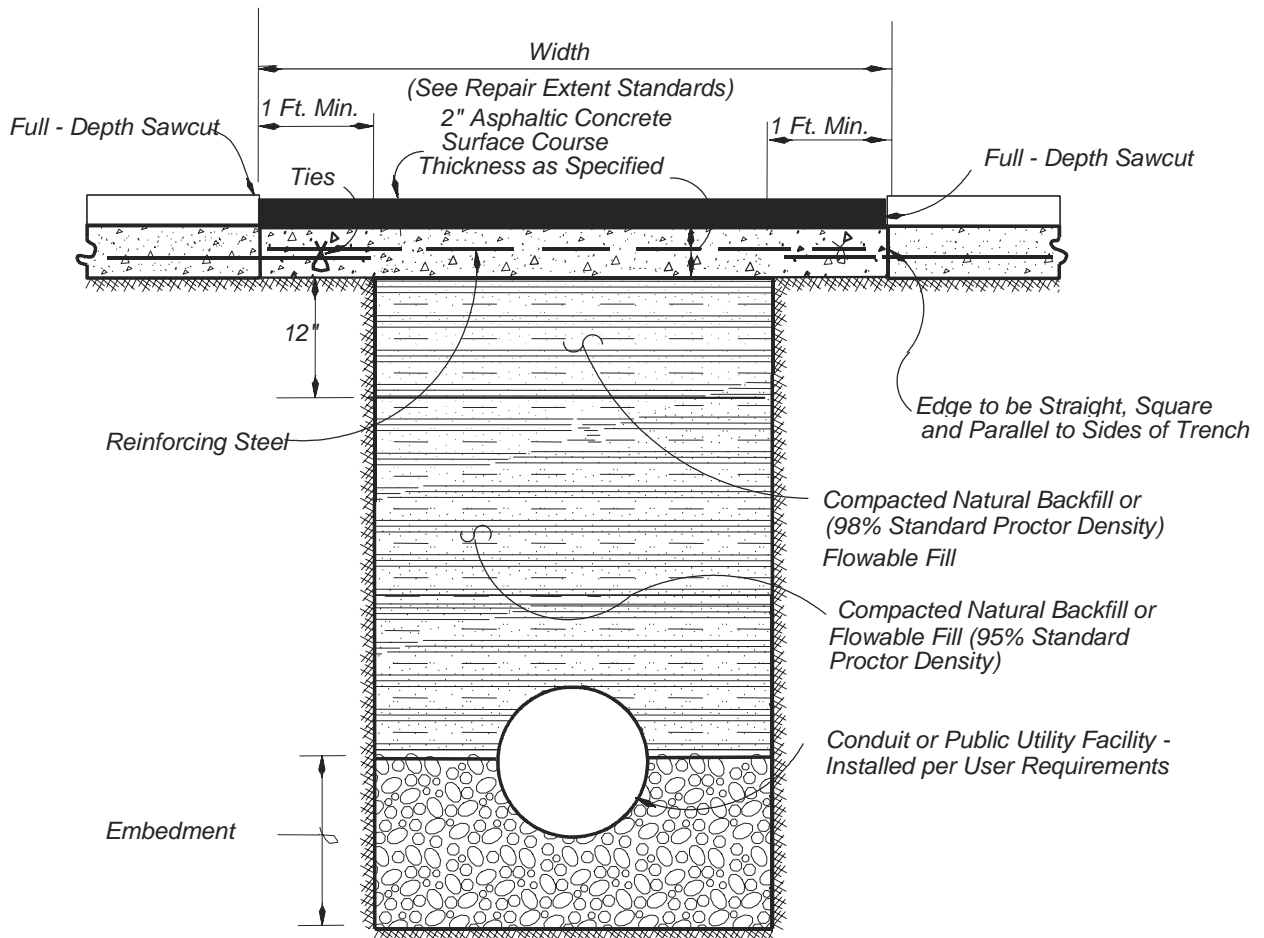
Reinforcing bars shall be replaced with like-size bars lapping 30 diameters or a minimum of 18 inches on splices. If splices cannot be made with the existing pavement reinforcing bars or if there are no existing reinforcing bars apparent, the existing concrete pavement shall be drilled 12 inches deep and like size dowel bars with a minimum length of 30 inches shall be epoxy grouted into the existing slab 12 inches deep on 24-inch centers along the sides of the exposed existing concrete pavement cut and lapped with the new reinforcing bars. If no existing reinforcing bars are apparent, the spacing and bar size of the new reinforcing bars shall be # 4 bars on 24-inch centers. The concrete base shall be replaced with "Hand Finish" class concrete to a line two inches below the asphaltic concrete surface of the street and a thickness matching the existing concrete base except that the thickness shall be no less than the following:

- Six (6) inches for local streets. (Local streets are typically residential streets with a width not exceeding 26 feet and not on a bus route.)
- Eight (8) inches for residential collectors.
- Nine (9) inches for thoroughfares and collectors.
- Ten (10) inches for streets located in the Central Business District.

Upon completion and curing of the concrete base, the final 2 inches of permanent pavement repair shall be made as follows:

- Using fine graded surface course hot mix asphalt on residential streets.
- Using coarse graded surface course hot mix asphalt on collector and arterial streets.

The construction of the “Hand Finish” class concrete base and the final two thickness of fine or coarse graded surface course hot mix asphaltic concrete shall be in accordance with Item 5.8.1.1 of the Department of Public Works Addendum to the Standard Specifications and the Standard Specifications. See Detail 2 - Replacing Asphaltic Concrete Pavement with Concrete Base below:



Pavement with Concrete Base

3. Replacing “Full Depth” Asphaltic Concrete Pavement on Natural Soil Base

Unless otherwise or specified, when a street surfaced with asphaltic concrete on natural soil base is cut, the pavement shall be replaced as follows. The backfill shall be brought up to the bottom of the pavement or the required depth to provide the required section of flowable fill and topping and satisfactorily densified in accordance with section IV of this manual. The edges of the existing asphaltic concrete paving shall be cut back so as to produce a vertical edge for the full depth of the paving. The cut shall then be based with flowable fill to a line two inches below the top of the asphaltic concrete surface. The thickness of the flowable fill base shall not be less than the following:

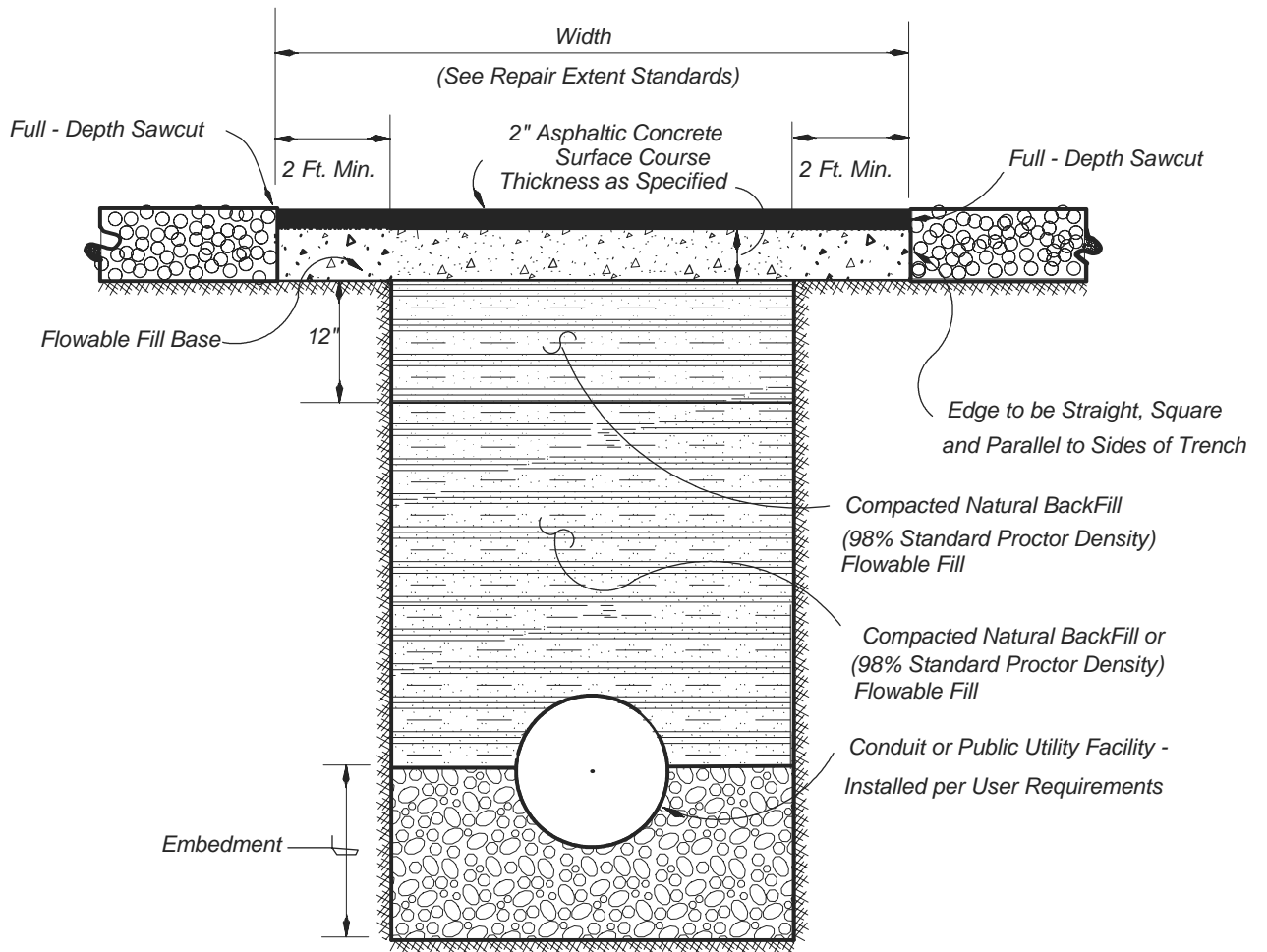
- Six (6) inches for local streets, alleys and driveways. (Local streets are typically residential streets with a width not exceeding 26 feet and not on a bus route.)
- Eight (8) inches for residential collectors and commercial driveways.
- Nine (9) inches for thoroughfare and collectors.
- Ten (10) inches for streets located in the Central Business District.

Whenever the flowable fill method is used for trench backfill the flowable fill shall be placed in the trench and brought to a line two (2) inches below the top of the asphaltic concrete surface.

Upon completion and curing of the flowable backfill, the final 2 inches of permanent pavement repair shall be made as follows:

- Using fine graded surface course hot mix asphalt on residential streets.
- Using coarse graded surface course hot mix asphalt on collector and arterial streets.

The construction of the final two-inch thickness of asphaltic concrete surface over the flowable fill shall be in accordance with Item 5.8.1.1 of the Department of Public Works Addendum to the Standard Specifications and the Standard Specifications. See Detail 3 – Replacing “Full Depth” Asphaltic Concrete Pavement on Natural Soil below:

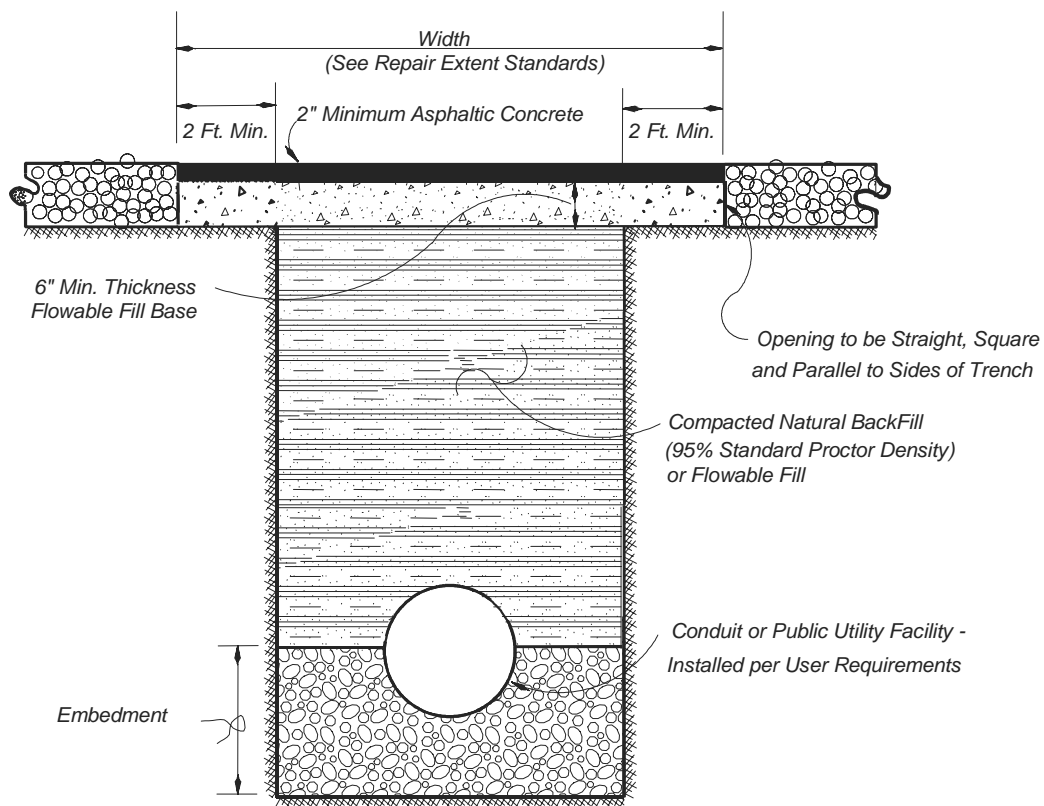


Replacing "Full Depth" Asphaltic Concrete Pavement on Natural Soil

4. Replacing Asphaltic Concrete Pavement on Flexible Base

Unless otherwise indicated or specified, when a street surfaced with asphaltic concrete on flexible base is cut, the pavement shall be replaced as follows: The backfill shall be brought up to the bottom of the flexible base and satisfactorily densified in accordance with section IV of this manual. The edges of the existing asphaltic concrete paving shall be cut back so as to produce a vertical edge for the full depth of the paving. The cut shall then be based with flowable fill to a depth matching the existing thickness of flexible base but in no case less than 6 inches. The construction of the final two inches of pavement shall be fine or coarse graded surface course hot mix asphaltic concrete as provided in Item 3 “Replacing Full Depth Asphaltic Concrete Pavement on Natural Soil Base” of this Manual and shall be in accordance with the Standard Specifications for Public Works construction.

Whenever the flowable fill method of backfill is used the material shall be placed, full depth, to a line two (2) inches below the top of the asphaltic concrete surface. The final asphaltic concrete hot mix shall be placed as required in this item over the flowable fill to a thickness not less that two (2) inches. See Detail 4 - Replacing Asphaltic Concrete Pavement on Flexible base below:

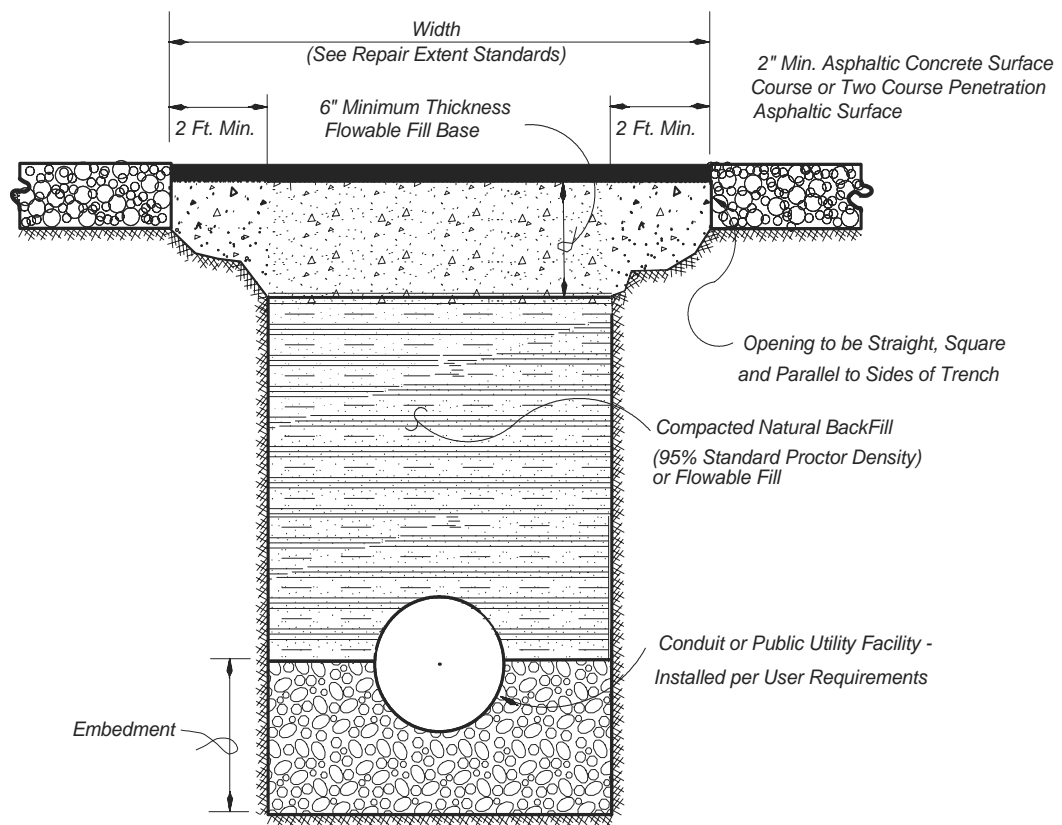


Replacing Asphaltic Concrete Pavement on Flexible Base

5. Replacing Penetration Type Pavement on Flexible Base

Unless otherwise indicated or specified, when a street surfaced with penetration type pavement on flexible base is cut, the pavement shall be replaced as follows. The backfill shall be satisfactorily densified in accordance with section IV of this manual. The cut shall then be based with flowable fill to a depth matching the existing thickness of flexible base but in no case less than six (6) inches. The installation of the final two inches of asphalt surface shall be surface course hot mix asphaltic concrete as provided for in Item 3 “Replacing ‘Full Depth’ Asphaltic Concrete Pavement on Natural Soil Base” of this Manual and shall be in accordance with the Standard Specifications for Public Works Construction.

Whenever the flowable fill method is used, backfill shall be used full depth and brought to a line not to exceed two (2) inches below the top of the existing asphaltic concrete surface. The flowable fill method is preferred and shall be used to limit the inconvenience to the general public. See Detail 5 - Replacing Penetration Type Pavement on Flexible Base below:



Replacing Penetration Type Pavement on Flexible Base

6. Replacing Special Pavement

Special Pavements are those with a surface of brick, stone, exposed aggregate, manufactured paving blocks or other surfaces designed to present unique visual images, color or designs. Cuts or excavations in these special pavements shall be avoided whenever possible, by accomplishing repairs through boring or tunneling.

When a cut or excavation in a special pavement in a street, alley, median or sidewalk of the public street right of way is unavoidable, the contractor shall, in addition to complying with the requirements of all applicable preceding repair standards, take whatever additional measures are necessary to restore the pavement area to a condition equal to or better than the preexisting condition. Removals shall be from joint or back of curb to joint or back of curb. Saw cutting of special pavements shall not be permitted.

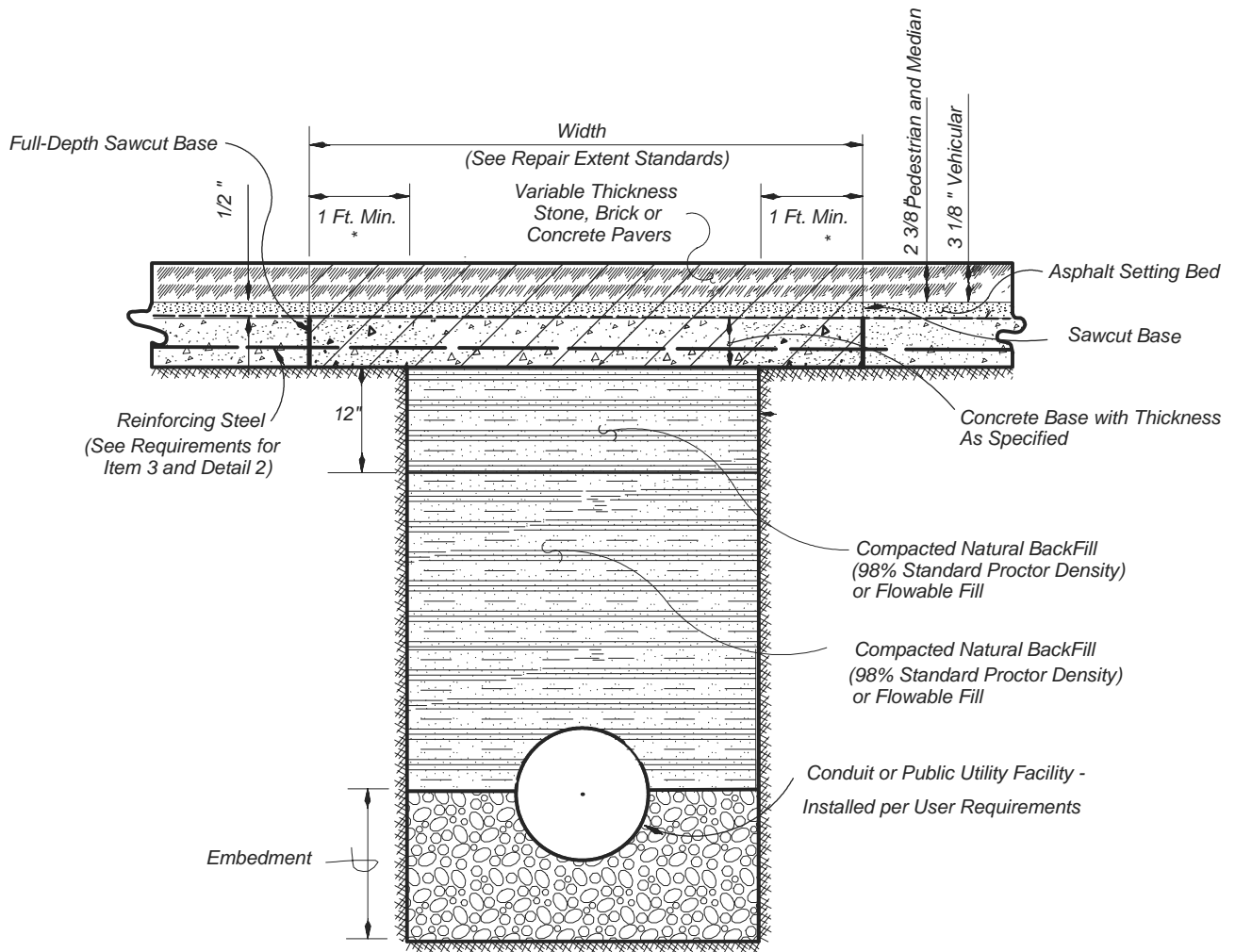
To establish the preexisting condition of the pavement prior to the cut or excavation, the contractor may take pictures before the work begins. The presence of a photograph taken prior to the actual repair activity shall not relieve the contractor of the responsibility to correct any damage to special pavements caused by the condition of the utility facility or the repair activity. However, all pavement restoration shall be to the satisfaction of the director and entirely at the contractor's expense. The contractor shall match the color, texture and pattern of the existing pavement.

Concrete base shall be "Hand Finish" class concrete for streets, alley and driveways and "Sidewalks, Separate Curb and Gutter, and Four (4) Inch Thick Median Pavement" class concrete for other non-vehicular traveled pavements.

Thicknesses shall be:

- 5" for pedestrian (non-vehicular traveled) pavements.
- 8" for local and residential collectors.
- 9" for thoroughfares and collectors.
- 10" for streets in the Central Business District.

Paver reinstatement shall be as required by the City of Dallas Department of Public Works and Transportation Specifications. Classes of concrete and construction shall be as provided in Item 5.8.1.1 of the Department of Public Works Addendum to the Standard Specifications. See Detail 6 - Replacing Special Pavement below:



Replacing Special Pavement

Note: * Removal of Pavers shall be at least the minimum shown to the next whole paver block.

VII. RESTORATION DETAILS FOR NEWLY CONSTRUCTED, RECONSTRUCTED, OR RESURFACED STREETS

Replacement of pavement in a newly constructed, reconstructed, or resurfaced street may not be made for 60 months after substantial completion of the work unless repairs are made in compliance with the preceding details in section VII. RESTORATION DETAILS and to the extent described below.

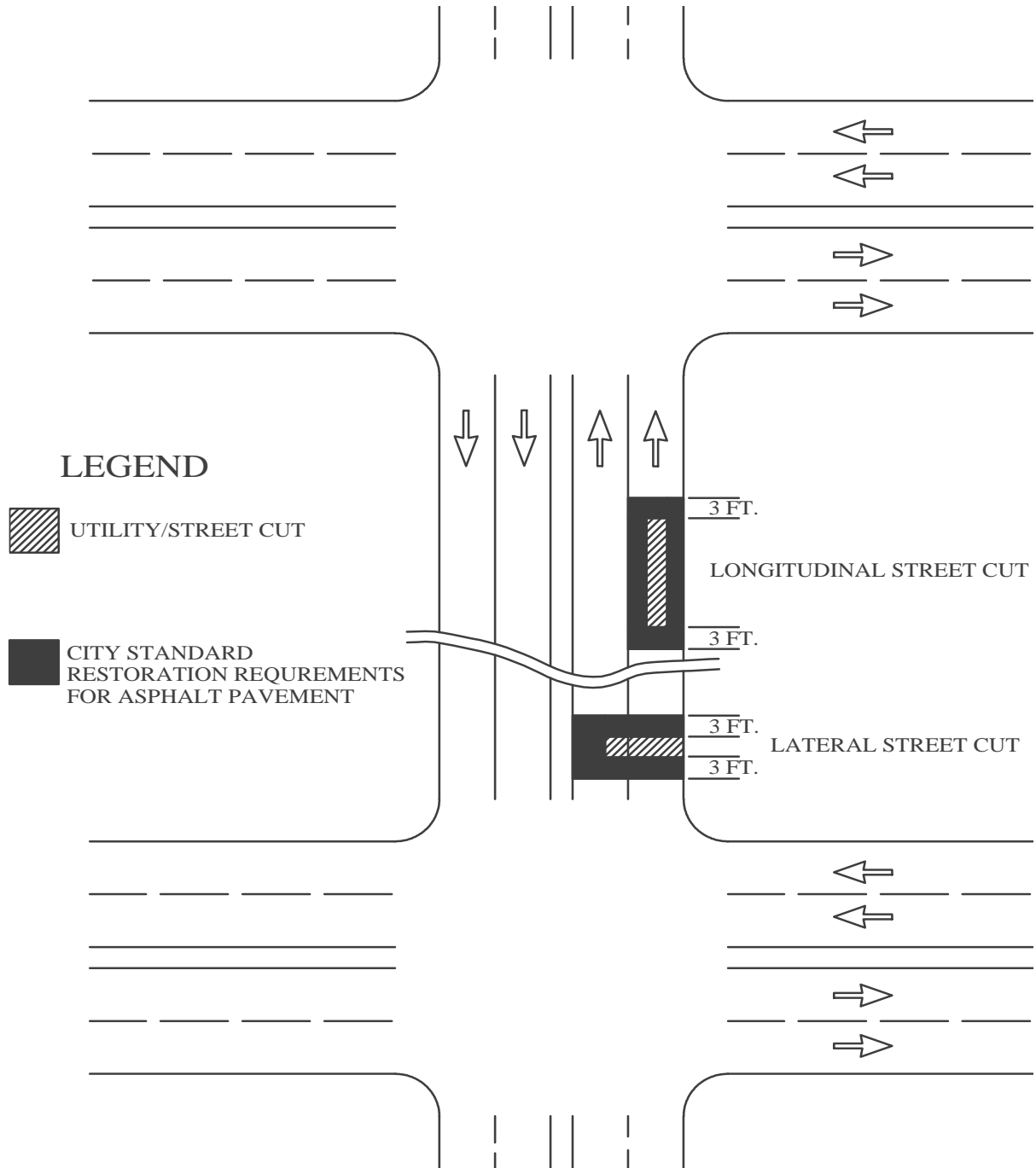
The contractor should not proceed with pavement restoration until the Public Works and Transportation inspector approves the replacement limits. For asphalt streets, restorations will be no less than one lane width and extend no less than three feet in the longitudinal direction from the edge of the cut. For concrete streets, the removal limit will extend beyond the edge of the cut to the nearest expansion, construction or dummy joint or to the point halfway between the two joints where the edge of the cut terminates, whichever is less. The cut width includes the required 1-2 feet ledge to undisturbed soil on both sides to of the trench excavation.

For asphalt streets, the contractor will be required to Slurry Seal or Micro-surface the asphalt pavement for uniformity, or other acceptable method to match pavement color. The determination of treatment type will be made by the City. The treatment will be for the entire block in which the cut was made.

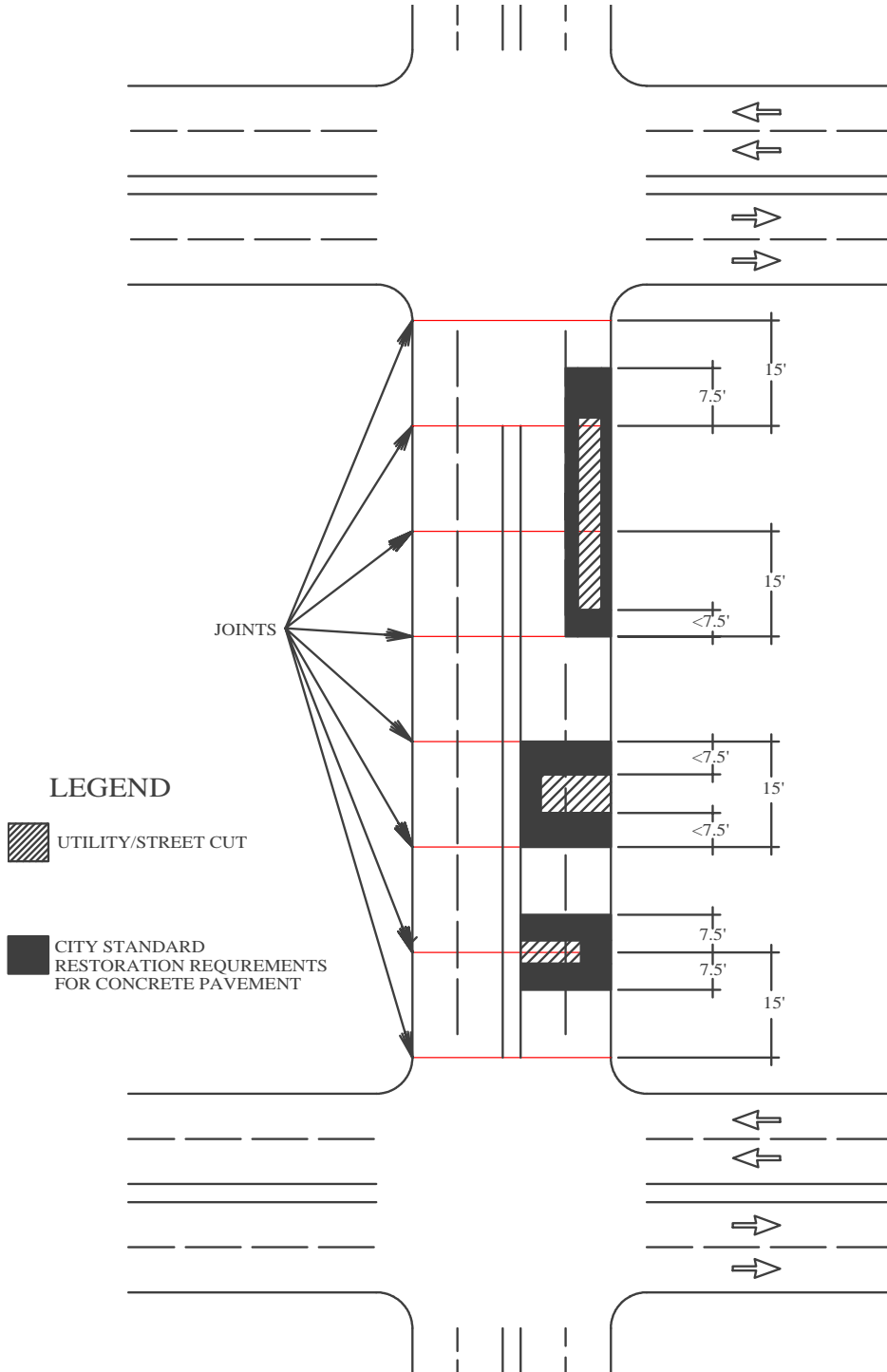
City of Dallas Slurry Seal and Micro-surfacing specifications as currently amended by the Department of Street Services shall govern the design, material, testing and construction.

Some examples of restorations to cuts made on newly constructed, reconstructed, or resurfaced streets are shown on the following pages:

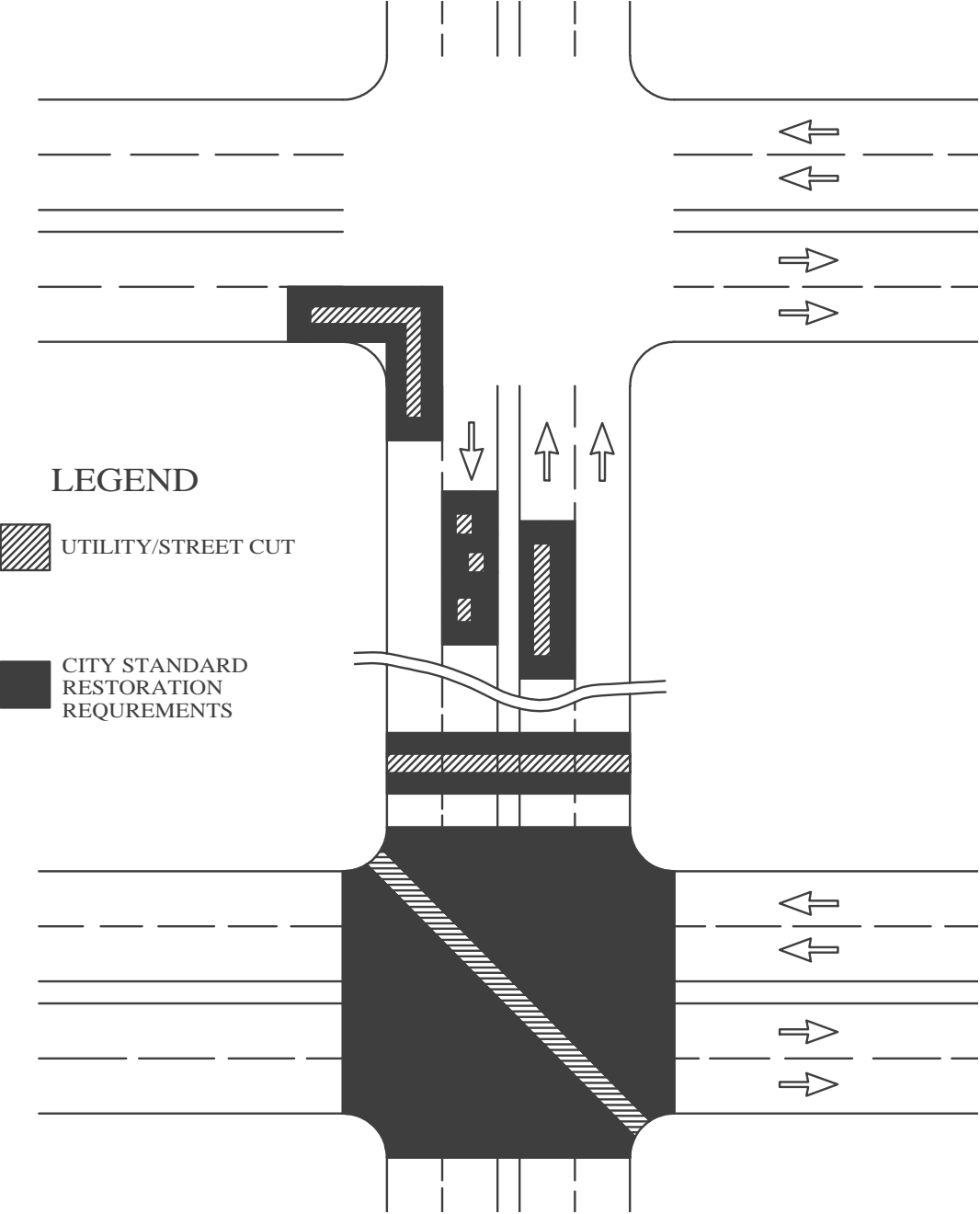
**TYPICAL RESTORATION LIMITS FOR ASPHALT PAVEMENT
TO REPAIR CUTS TO STREETS 5 YEARS OLD OR LESS**



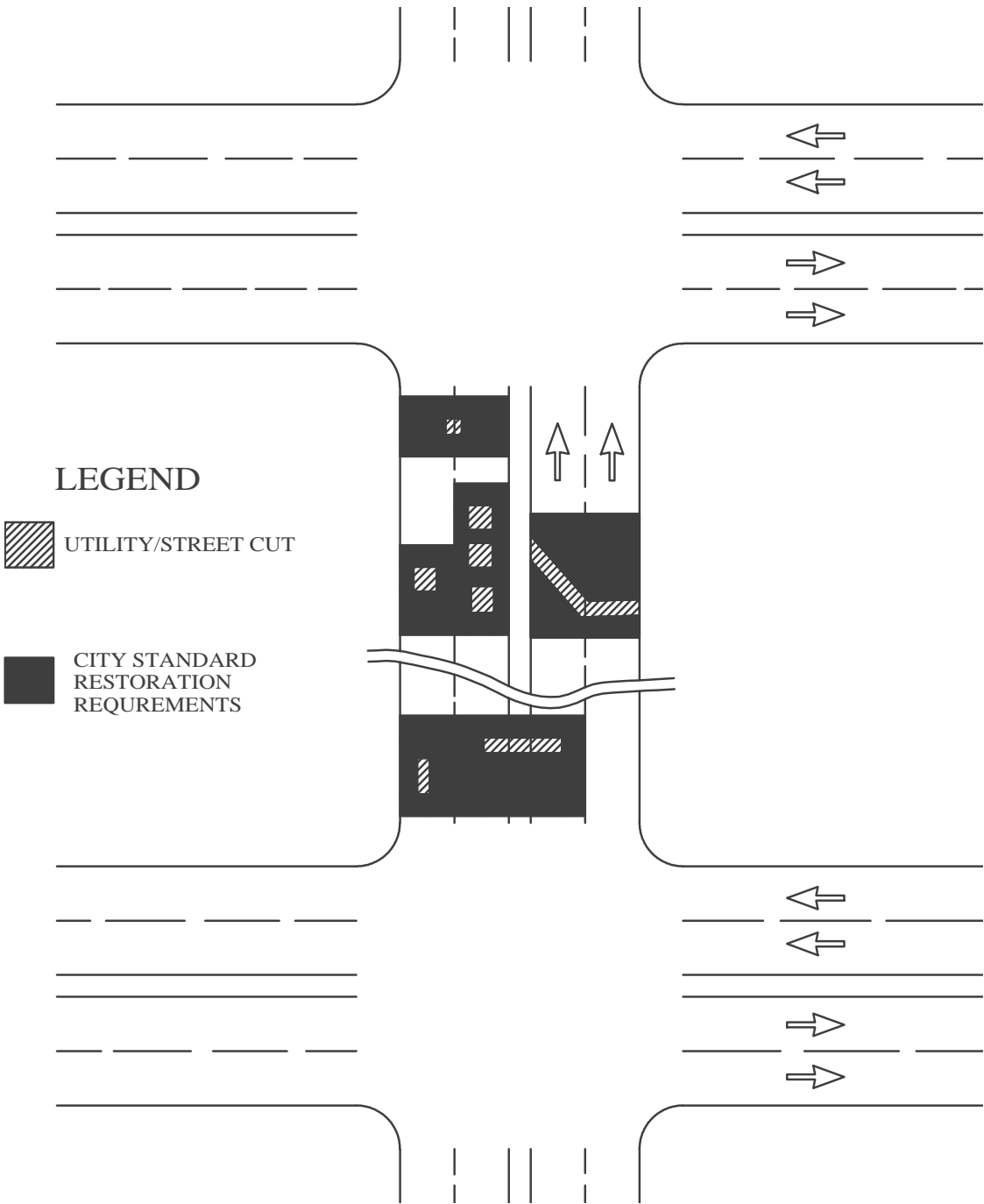
**TYPICAL RESTORATION LIMITS FOR CONCRETE PAVEMENT
TO REPAIR CUTS TO STREETS 5 YEARS OLD OR LESS**



EXAMPLES OF RESTORATION LIMITS FOR NEWLY CONSTRUCTED, RECONSTRUCTED, OR RESURFACED STREETS

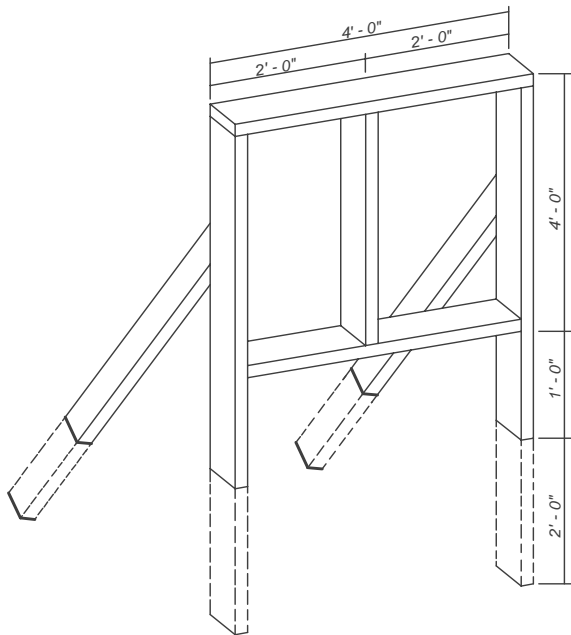
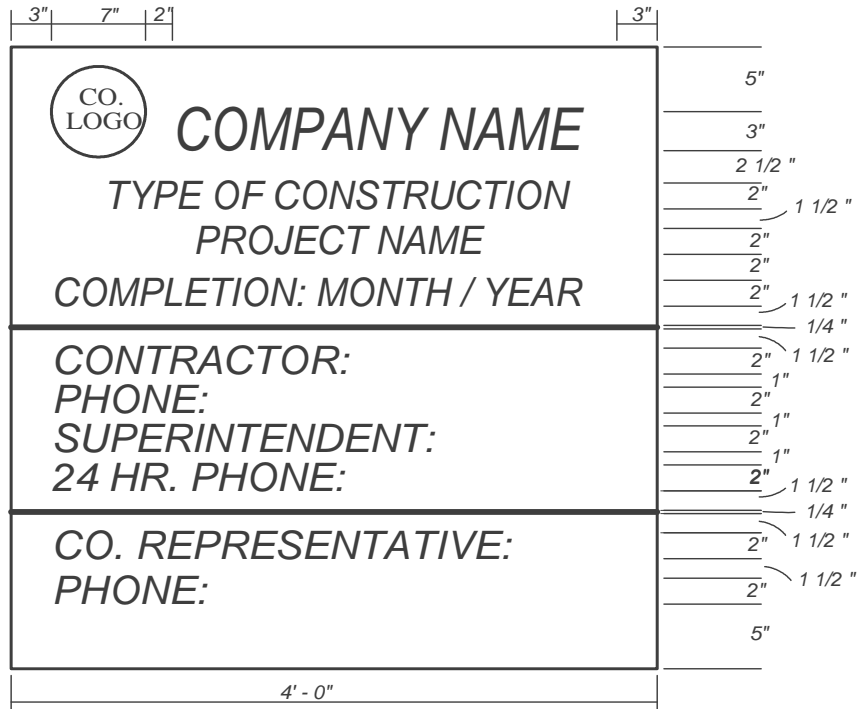


EXAMPLES OF RESTORATION LIMITS FOR NEWLY CONSTRUCTED, RECONSTRUCTED, OR RESURFACED STREETS (CONT.)



VII. PROJECT SIGN

A project sign is required for work where there will be any closure of a traffic lane or blocking of a sidewalk or alley for longer than one day. The sign must be built to the specification contained in this manual. The sign must be posted at or in close proximity to the worksite. The sign may be attached to the barricading used at the project site in lieu of the specified wooden stand. A previously used sign with updated information may be used at a project site subject to the discretion of the inspector.



NOTES:

1. BOARD - 3/4 " EXTERIOR OR MARINE GRADE PLYWOOD OR APPROVED EQUAL, PAINTED WHITE.
2. COMPANY SYMBOL - REFLECTIVE VINYL APPROX. 6" HIGH
3. STRIPES - DARK REFLECTIVE VINYL APPROX. 1/4 " WIDE.
4. LETTERING - HELVETICA REGULAR 3" & 2" SIZES. USE PREMANUFACTURED VINYL, DARK.
5. FRAME OF 2"X4" STOCK TO BE PAINTED BLACK.
6. ALL PAINT TO BE OUTDOOR TYPE.

SIGN DETAIL