



MARICOPA COUNTY
Department of Transportation

MEMORANDUM

Date: June 4, 2014 Revised 2015-05-18
To: MAG Specifications and Details Committee
From: Robert Herz, MCDOT Representative
Subject: Revisions to Sections 336, 321.10.3, 601.2.7, 601.2.10, and **Case 14-12**
Detail 200-1

PURPOSE: Add pavement removal criteria to prevent full depth pavement cuts from being located within a lane wheel path and to prevent creation of narrow pavement edge strips.

REVISIONS:

1. Identified location restrictions for full depth longitudinal joints for asphalt pavement widening and for asphalt pavement trench repairs.
2. Defined vertically offset joint as an alternative for full depth sawed joint.
3. Added pavement removal requirements when replacing existing curb or gutter.
4. Added requirement for asphalt pavement edge replacement to have a safety edge or thickened edge constructed per Detail 201 except when the asphalt edge abuts a concrete curb or gutter.
5. Trenching into portland cement concrete pavement, sidewalk, or other concrete flatwork shall require complete joint to joint replacement of damaged panels. Type C Trench Repair in Detail 200-1 is to be deleted.
6. Adjusted the measurement for trench surface replacement to include extra area required to eliminate narrow edge remnants and to move full depth asphalt cuts outside of defined lane wheel paths.

SECTION 336

PAVEMENT MATCHING AND SURFACING REPLACEMENT

336.1 DESCRIPTION:

This specification identifies requirements for removing and replacing or widening ~~Street and alley~~ pavement and replacing other surfacings within ~~the Contracting Agency's public rights-of-way, removed by construction activities or to be widened or matched in connection with the improvement of Public Works, shall be placed as shown on the plans and applicable standard details, in accordance with this specification and/or the special provisions.~~

Asphalt concrete roadway ~~pavement replacement~~ trench repairs shall be constructed in accordance with Type A, B, or T-Top Trench Repair of Standard Detail 200-1 and as indicated on the plans or in the special provisions.

Trench repairs for unpaved alleys, roadways, and designated future roadway prism shall be constructed in accordance with Type E Trench Repair of Standard Detail 200-1.

Trenching into ~~P~~portland cement concrete pavement, sidewalk, or other concrete flatwork shall require complete joint to joint replacement of damaged panels unless an alternative repair is required by contract documents or is authorized in writing by the Engineer. ~~replacement shall be in accordance with Type C of the Standard Detail 200-1 and as required by Section 324.~~

~~All other s~~Surface replacement in the right-of-way ~~but~~ not in paved roadways shall be constructed in accordance with Type D Trench Repair of Standard Detail 200-1 and as indicated on the plans ~~or in the special provisions.~~

Temporary pavement replacement shall be constructed as required herein.

~~Asphalt p~~Pavements to be matched by construction of new pavements adjacent to or at the ends of a project shall be milled or saw cut in accordance with these specifications and where shown on the plans.

Pavement and surfacing replacement within ADOT rights-of-way shall be constructed in accordance with their permits and/or specification requirements.

336.2 MATERIALS AND CONSTRUCTION METHODS:

Materials and construction methods used in the replacement of pavement and surfacing shall conform to the requirements of all applicable standard details and specifications, latest revisions.

336.2.1 Pavement Widening or Extensions: Existing pavements which are to be matched by pavement widening or pavement extension shall be trimmed to a neat true line with straight vertical edges free from irregularities with a device specifically designed for this purpose. ~~The minimum depth of cut shall be 1 ½ inches or D/4, whichever is greater.~~

~~The e~~Existing asphalt pavement shall be cut and trimmed after placement of required ABC and just prior to placement of asphalt concrete for pavement widening or extension, and the trimmed edges shall ~~be have painted with a light coating of asphalt cement or emulsified asphalt tack coat applied to the vertical edges~~ immediately prior to constructing the new abutting asphalt concrete pavements. No extra payment shall be provided for these items and all costs incurred in performing this work shall be incidental to the pavement widening or pavement extension.

The location of longitudinal match points shall depend on the type of asphalt joint being constructed (full depth or offset) and the location of the pavement lane striping to be in place at completion of construction. Full depth longitudinal joints shall be located within one foot of a post construction lane line stripe or within the center two feet of a post construction travel lane. The location restriction for full depth longitudinal joints does not apply to multi-layer pavements when a vertically offset joint with the existing pavement is constructed. An acceptable offset joint shall have at least a six-inch horizontal offset with the nearest joint in the underlying asphalt layer. An offset joint may be obtained by edge milling to a depth that meets the minimum lift thickness identified in section 710 for the asphalt surface course to be placed.

The exact point of matching, termination, and overlay may be adjusted in the field, ~~if necessary,~~ by the Engineer or designated representative.

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336.2.2 Pavement to be Removed: Existing asphalt pavement to be removed for trenches or for other underground construction or repairs shall be cut by a device capable of making a neat, straight and smooth cut without damaging adjacent pavement that is not to be removed. The Engineer's decision as to the acceptability of the cutting device and manner of operation shall be final.

In lieu of cutting trenches across driveways, curbs and gutters, sidewalks, alley entrances, and other types of pavements, the Contractor may, when approved by the Engineer, elect to tunnel or bore under such structures and pavements.

When installations are within the street pavement and essentially parallel to the center-line of the street, the Contractor, with approval of the Engineer, may elect to bore or tunnel all or a portion of the installation. In such installations, the seal coat requirements, as discussed in Section 336.2.4, will be modified as follows:

(A) If the pavement cuts (bore pits, recovery pits, etc.) are 300 feet or more apart, the bore or tunneled distance will not be considered as part of the open trench and the seal coat ~~may~~ will not be required.

(B) If the pavement cuts (bore pits, recovery pits, etc.) are less than 300 feet apart, the distance between the cuts will be considered the same as a trench cut and the distance will be added to any trench cut distances.

Pavement removal limits when replacing existing curb or gutter shall be as follows. For curb or gutter replacement adjacent to a designated bike lane or paved shoulder area wider than three feet, the asphalt pavement removal and replacement shall extend to within 6 inches of the travel lane edge stripe. For curb or gutter replacement when no travel lane edge stripe exists, the asphalt pavement match point shall extend two feet or less from the pavement edge into the vehicle travel lane.

Asphalt pavement damaged by the Contractor during trenching or other activities shall be removed after adjacent aggregate base has been placed and compacted and prior to placement of the adjacent permanent pavement. The replacement of the damaged asphalt pavement shall occur at the same time as the permanent pavement replacement is constructed.

336.2.3 Temporary Pavement Replacement: Temporary pavement replacement, as required in Section 601, may be with cold-mix asphalt concrete, with a minimum thickness of 2 inches, using aggregate grading in accordance with Marshall mix design of Section 710. Permanent pavement replacement shall replace temporary repairs within 5 working days after completion of temporary work.

Temporary pavement replacement shall be used in lieu of immediate placement of single course permanent replacement or the first course of two course pavement replacement only on transverse lines such as spur connections to inlets, driveways, road crossings, etc., when required by the Engineer, by utilities or others who subcontract their permanent pavement replacement, under special prior arrangement; or for emergency conditions where it may be required by the Engineer. Temporary pavement replacement shall be placed during the same shift in which the backfill to be covered is completed.

Rolling of the temporary pavement replacement shall conform to the following:

(A) Initial or breakdown rolling shall be followed by rolling with a pneumatic-tired roller. Final compaction and finish rolling shall be done by means of a tandem power roller.

(B) On small areas or where equipment specified above is not available or is impractical, the Engineer will approve the use of small vibrating rollers or vibrating plate type compactors provided comparable compaction is obtained.

The surface of the temporary pavement shall be finished ~~off~~ flush with the adjacent pavement.

336.2.4 Permanent Pavement Replacement and Adjustments:

336.2.4.1 Permanent Asphalt Pavement Replacement: All asphalt pavement replacement shall match gradation and thickness of the existing pavement. ~~Immediately preceding the placement of permanent pavement the density of the base material shall comply with requirements of Table 601-2. Asphalt concrete pavement replacement shall be compacted to the same density specified for asphalt concrete pavements in Section 321. The compacted thickness of all courses shall conform to the recommended thicknesses requirements of Table 710-1.~~

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Unless otherwise noted, **asphalt concrete** pavement replacement shall comply with the following:

(A) Single course pavement replacement shall consist of a 1/2" or 3/4" mix in accordance with Section 710.

(B) The base course(s) of a multi-course pavement replacement shall consist of a 3/4" mix in accordance with Section 710.

(C) The surface course of a multi-course pavement replacement shall consist of a 3/8" or 1/2" mix in accordance with Section 710 to match the existing surface.

(D) Where the base course is to be placed with non-compactive equipment, it shall be immediately rolled with a pneumatic-tired roller.

(E) **Pavement replacement over trenches** ~~where the pavement replacement width trench is 6 feet or more in width~~, all courses shall be placed with self-propelled spreading and compacting equipment. When the **pavement replacement width trench** is from 6 to 8 feet ~~in width~~, self-propelled spreading and compacting equipment shall not be wider than 8 feet.

(F) Placement of the surface course is to be by means which will result in a surface flush with the existing pavement. The pavement replacement surface shall not vary more than 1/4 inch from the lower edge of a straightedge placed across the replacement pavement surface between edges of the existing matched surfaces. When the pavement replacement includes replacement of the roadway crown, the surface smoothness shall comply with requirements of Section 321.

(G) **Pavement replacement extending to the edge of asphalt pavement not abutting concrete shall have a safety edge or thickened edge constructed per Detail 201 as deemed appropriate by the local jurisdiction.**

~~Laying a single course or the base course(s) of the asphalt concrete pavement replacement shall never be more than 600 feet behind the ABC placement for the pavement replacement.~~

~~The trench must be compacted to its required density, and required ABC must be in place and compacted prior to the placement of the asphalt concrete.~~

For **trench cuts, pavement widening, or other partial pavement installations** greater than 300 feet in length the entire area shall ~~then~~ be slurry seal coated in accordance with Section 332 or as otherwise specified. ~~The~~ seal coat shall extend from the edge of pavement or lip of gutter to the street centerline except that on residential streets less than 36 feet face to face of curb ~~or and~~ where the pavement patch straddles the centerline, the entire width of street shall be seal coated.

In lieu of placing the seal coat as required previously, and with approval of the ~~Contracting Agency~~ local jurisdiction, the Contractor may deposit with the **Street Maintenance Department** ~~Contracting Agency~~ for credit ~~to the Street Maintenance Department~~, a negotiated agreed upon amount. The Street Maintenance Department will incorporate this work into their street maintenance program.

336.2.4.2 Adjustments: When new or existing manholes, valves, survey monuments, clean outs, etc. fall within the limits of the permanent pavement replacement as discussed in this Section, the Contractor shall be responsible for adjusting the various items to the new pavement surface ~~or as directed by the Engineer. This will include but not be limited to slurry and chip seals.~~

The Contractor ~~will~~ shall coordinate with the Engineer and with representatives of the various utilities regarding the adjustment and inspection of the work. The Contractor shall be responsible for obtaining and complying with all specifications, special requirements, and details ~~etc. for of the adjustment of utility company facilities regarding the adjustments.~~ When adjusting the Agency's utilities, survey monuments, etc., the adjustment will comply with these specifications and details.

The work will be done in compliance with OSHA standards and regulations regarding confined space entry. The Contractor shall remove all material attached to the lids and/or covers including that of prior work. The method of removal shall be approved by the Engineer and/or the Utility Representative.

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336.3 TYPES AND LOCATIONS OF ~~PAVEMENT AND TRENCH SURFACEING~~ REPLACEMENT:

~~The trench backfill shall must be in place and compacted to the density its required in Table 601-2 density, and required ABC must be in place and compacted prior to the placement of the asphalt concrete structural section or other surfacing.~~

~~Laying a single course or the base course(s) of the asphalt concrete pavement replacement for trenches shall never be more than 1320 600 feet behind the ABC placement for the pavement replacement.~~

~~Normally, the type of pavement surface replacement and backfill required for trenches shall will be as noted on the plans or special provisions specified in other portions of the contract documents and construction will shall be in accordance with Detail 200-1 and 200-2.- If a trench repair type is not noted on the plans or specified in the special provisions, the following criteria will govern:~~

~~Type A trench repair will be used for utilized on all asphalt concrete paved streets where the excavation is essentially longitudinal or parallel to traffic. Full depth longitudinal joints shall not be located within forty-eight inches (48") of an asphalt pavement edge or within a lane wheel path. The lane wheel path for a traffic lane is the entire lane width except the area within one foot of a traffic lane line stripe and except the center two feet of the lane. The lane wheel path for a designated bike lane is the entire lane width except the area within six inches (6") of a bike lane edge stripe. When the surface match point is located within 48" of an asphalt pavement edge, all asphalt surfacing shall be removed to the asphalt edge, the replacement surfacing shall extend to the asphalt edge. The traffic lane wheel path restrictions for full depth longitudinal joints do not apply for offset joints that provide at least a six-inch horizontal offset between the surface course joint and the joint in the underlying asphalt layer. The depth of the asphalt surface course shall be equal to or greater than the minimum thickness recommended in Table 710-1.~~

~~T-Top trench repair will be utilized on all streets used where the excavation is essentially transverse or not parallel to traffic, including trenches that go through an intersection.~~

~~Type B trench repair may shall only be used to repair transverse trenches if when specified by the local jurisdiction Agency.~~

~~Type C trench repair will be used to repair existing Portland cement concrete pavement.~~

~~Type D trench repair will be utilized used to repair surfaces other than asphalt concrete or P portland cement concrete pavement. When a trench cut is in aggregate surfaced area, t The surfaceing replacement shall be of a like type and depth as the existing material, compacted to the densities required in Section 601. It may also be used when the condition of the existing pavement does not justify construction of Type A, Type B or T-Top trench repair. Prior written approval of the Engineer is required for this condition.~~

~~Where a longitudinal trench is partly in pavement, the pavement shall be replaced to a neat straight line located at the outside limits edge of the existing pavement., -on a straight line~~

~~Where asphalt pavement replacement extends to an uncurbed asphalt edge, the agency designated edge treatment, as indicated on the plans shown in Detail 201- (Type A, Type B, or Safety Edge) shall be installed. Measurements for payment shall be from the inner limit of pay width allowed below, to the outside edge of the existing pavement as defined herein.~~

~~Where no part of a trench is in a landscaped or graded area outside of pavement, no special surfaceing treatment is required except replacement will only be as indicated by plans or specifications specified where existing surfacing materials have been removed.~~

~~When a trench cut is in aggregate surfaced area, the surfaceing replacement shall be of a like type and depth as the existing material, compacted to the densities required in Section 601.~~

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336.4 MEASUREMENT:

Measurement for ~~payment and surfacing~~ replacement shall be by the square yard, based ~~up~~ on actual field measurement -of the area covered except as noted below.

(A) In computing pay quantities for ~~surface~~ replacement of Types B ~~and~~ E trench repair, the default pay widths will be based on the ~~actual field measured width; however the boundaries of the measurement will not extend further than ½ the distance, either side, from the centerline of the pipe as depicted on~~ dimension calculated from Table 601-1, for the "Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel". The pay width will be adjusted to the minimum required field width when relocation of the pavement match point is due to the remnant requirement or when pavements less than 4" thick are required to be adjusted outside of a wheel path.

(B) In computing pay quantities for ~~surface~~ replacement of a Types T-Top or, Type A, ~~C and D~~ trench repair, ~~pay~~ the default widths will be based on the dimension calculated from ~~actual field measured width, however the boundaries of the measurement will not extend further than ½ the distance plus 12 inches, either side, from the centerline of the pipe as depicted on~~ Table 601-1, for the "Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel" plus 24 inches. The pay width will be adjusted to the minimum required field width when relocation of the pavement match point is due to the remnant requirement or when pavements less than 4" thick are required to be adjusted outside of a wheel path. In all cases, the minimum pay width for ~~replacement Types T-Top, or Type A and D~~ surface replacement shall be 48 inches.

(C) In computing pay quantities of surface replacement for Type D trench repair, pay widths will be based on the dimension calculated from Table 601-1 for the "Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel". In all cases, the minimum pay width for Type D surface replacement shall be 48 inches.

(~~C~~D) Where a longitudinal trench is partly in asphalt pavement, ~~computations of~~ pay quantities shall ~~be based on~~ not exceed ~~the~~ actual pavement replacement quantities. The measurement shall be the area as allowed for the respective Type A or Type B trench repair limited to that portion located within the existing pavement. ~~limitations specified above.~~ The minimum 48 inch pay width for the Type A pavement replacement does not apply when the trench is partially in pavement.

(~~D~~E) The length of pavement and surfacing replacement shall be measured through any manhole, valve box, or other structure constructed in the pipe line, and any pavement or surface replacement and/or seal treatment in excess of the ~~above pay~~ trench ~~repair~~ widths shall be considered and included in the bid item for such structure.

(~~E~~F) Any pavement replacement in excess of the specified pay widths necessitated by the installation of valves, tapping sleeves and valves, valve by-passes, and concrete thrust blocks shall be included in the bid price for these items.

(~~F~~G) ~~When special provisions allow deviations from the trench widths specified in Section 601, the above allowed pay widths for pavement replacement may be altered where so specified.~~

(~~G~~) Measurement of pavement and surfacing replacement shall be made along the finished surface ~~excluding any extra replacement required due to Contractor caused damage. -of the ground to the nearest foot, and~~ The measured quantity shall be computed to the nearest square yard.

(H) No separate measurement or payment will be made for the required construction of a Detail 201 edge treatment.

336.5 PAYMENT:

Direct payment for pavement or ~~other surfacing~~ replacement will be made for replacement over all pipe trench cuts except as otherwise ~~allowed~~ noted in the special provisions. Payment for ~~surface~~ replacements over other work shall be included in the cost of constructing that work, ~~in accordance with the applicable standard details and specifications.~~

Payment for temporary pavement replacement shall be included in the cost of the pipe.

Payment for pavement replacement shall include the replacement cost of any existing pavement markings that have been ~~degraded, obscured, obliterated or removed~~ by ~~underground trench construction or repairs.~~

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When a Contractor has the option of jacking and/or boring or open cut construction, and elects to construct a pipeline by the jacking and/or boring method, ~~he~~ the Contractor will be paid for the replacement of such items of work as pavement, curb and gutter, sidewalk, driveway, and alley entrances, as allowed for open cut construction.

- End of Section -

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PAVEMENT MATCHING AND SURFACING REPLACEMENT

336.1 DESCRIPTION:

This specification identifies requirements for removing and replacing or widening pavement and replacing other surfacings within public rights-of-way.

Asphalt concrete roadway trench repairs shall be constructed in accordance with Type A, B, or T-Top Trench Repair of Standard Detail 200-1 and as indicated on the plans or in the special provisions.

Trench repairs for unpaved alleys, roadways, and designated future roadway prism shall be constructed in accordance with Type E Trench Repair of Standard Detail 200-1.

Trenching into portland cement concrete pavement, sidewalk, or other concrete flatwork shall require complete joint to joint replacement of damaged panels unless an alternative repair is required by contract documents or is authorized in writing by the Engineer.

Surface replacement in the right-of-way not in paved roadways shall be constructed in accordance with Type D Trench Repair of Standard Detail 200-1 and as indicated on the plans or in the special provisions.

Temporary pavement replacement shall be constructed as required herein.

Asphalt pavements to be matched by construction of new pavements adjacent to or at the ends of a project shall be milled or saw cut in accordance with these specifications and where shown on the plans.

Pavement and surfacing replacement within ADOT rights-of-way shall be constructed in accordance with their permits and/or specification requirements.

336.2 MATERIALS AND CONSTRUCTION METHODS:

Materials and construction methods used in the replacement of pavement and surfacing shall conform to the requirements of all applicable standard details and specifications, latest revisions.

336.2.1 Pavement Widening or Extensions: Existing pavements which are to be matched by pavement widening or pavement extension shall be trimmed to a neat true line with straight vertical edges free from irregularities with a device specifically designed for this purpose.

Existing asphalt pavement shall be cut and trimmed after placement of required ABC and just prior to placement of asphalt concrete for pavement widening or extension, and the trimmed edges shall have tack coat applied to the vertical edges immediately prior to constructing the new abutting asphalt concrete pavement. No extra payment shall be provided for these items and all costs incurred in performing this work shall be incidental to the pavement widening or extension.

The location of longitudinal match points shall depend on the type of asphalt joint being constructed (full depth or offset) and the location of the pavement lane striping to be in place at completion of construction. Full depth longitudinal joints shall be located within one foot of a post construction lane line stripe or within the center two feet of a post construction travel lane. The location restriction for full depth longitudinal joints does not apply to multi-layer pavements when a vertically offset joint with the existing pavement is constructed. An acceptable offset joint shall have at least a six-inch horizontal offset with the nearest joint in the underlying asphalt layer. An offset joint may be obtained by edge milling to a depth that meets the minimum lift thickness identified in section 710 for the asphalt surface course to be placed.

The exact point of matching, termination, and overlay may be adjusted in the field by the Engineer or designated representative.

336.2.2 Pavement to be Removed: Existing asphalt pavement to be removed for trenches or for other underground construction or repairs shall be cut by a device capable of making a neat, straight and smooth cut without damaging adjacent pavement that is not to be removed. The Engineer's decision as to the acceptability of the cutting device and manner of operation shall be final.

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In lieu of cutting trenches across driveways, curbs and gutters, sidewalks, alley entrances, and other types of pavements, the Contractor may, when approved by the Engineer, elect to tunnel or bore under such structures and pavements.

When installations are within the street pavement and essentially parallel to the centerline of the street, the Contractor, with approval of the Engineer, may elect to bore or tunnel all or a portion of the installation. In such installations, the seal coat requirements, as discussed in Section 336.2.4, will be modified as follows:

(A) If the pavement cuts (bore pits, recovery pits, etc.) are 300 feet or more apart, the bore or tunneled distance will not be considered as part of the open trench and the seal coat will not be required.

(B) If the pavement cuts (bore pits, recovery pits, etc.) are less than 300 feet apart, the distance between the cuts will be considered the same as a trench cut and the distance will be added to any trench cut distances.

Pavement removal limits when replacing existing curb or gutter shall be as follows. For curb or gutter replacement adjacent to a designated bike lane or paved shoulder area wider than three feet, the asphalt pavement removal and replacement shall extend to within 6 inches of the travel lane edge stripe. For curb or gutter replacement when no travel lane edge stripe exists, the asphalt pavement match point shall extend two feet or less from the pavement edge into the vehicle travel lane.

Asphalt pavement damaged by the Contractor during trenching or other activities shall be removed after adjacent aggregate base has been placed and compacted and prior to placement of the adjacent permanent pavement. The replacement of the damage asphalt pavement shall occur at the same time as the permanent pavement replacement is constructed.

336.2.3 Temporary Pavement Replacement: Temporary pavement replacement, as required in Section 601, may be with cold-mix asphalt concrete, with a minimum thickness of 2 inches, using aggregate grading in accordance with Marshall mix design of Section 710. Permanent pavement replacement shall replace temporary repairs within 5 working days after completion of temporary work.

Temporary pavement replacement shall be used in lieu of immediate placement of single course permanent replacement or the first course of two course pavement replacement only on transverse lines such as spur connections to inlets, driveways, road crossings, etc., when required by the Engineer, by utilities or others who subcontract their permanent pavement replacement, under special prior arrangement; or for emergency conditions where it may be required by the Engineer. Temporary pavement replacement shall be placed during the same shift in which the backfill to be covered is completed.

Rolling of the temporary pavement replacement shall conform to the following:

(A) Initial or breakdown rolling shall be followed by rolling with a pneumatic-tired roller. Final compaction and finish rolling shall be done by means of a tandem power roller.

(B) On small areas or where equipment specified above is not available or is impractical, the Engineer will approve the use of small vibrating rollers or vibrating plate type compactors provided comparable compaction is obtained.

The surface of the temporary pavement shall be finished flush with the adjacent pavement.

336.2.4 Permanent Pavement Replacement and Adjustments:

336.2.4.1 Permanent Asphalt Pavement Replacement: All asphalt pavement replacement shall match gradation and thickness of the existing pavement. Immediately preceding the placement of permanent pavement the density of the base material shall comply with requirements of Table 601-2. Asphalt concrete pavement shall be compacted to the same density specified in Section 321. The compacted thickness of all courses shall conform to the recommended thicknesses of Table 710-1.

Unless otherwise noted, asphalt concrete pavement replacement shall comply with the following:

(A) Single course pavement replacement shall consist of a 1/2" or 3/4" mix in accordance with Section 710.

(B) The base course(s) of a multi-course pavement replacement shall consist of a 3/4" mix in accordance with Section 710.

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(C) The surface course of a multi-course pavement replacement shall consist of a 3/8" or 1/2" mix in accordance with Section 710 to match the existing surface.

(D) Where the base course is to be placed with non-compactive equipment, it shall be immediately rolled with a pneumatic-tired roller.

(E) Pavement replacement over trenches where the pavement replacement width is 6 feet or more, all courses shall be placed with self-propelled spreading and compacting equipment. When the pavement replacement width is from 6 to 8 feet, self-propelled spreading and compacting equipment shall not be wider than 8 feet.

(F) Placement of the surface course is to be by means which will result in a surface flush with the existing pavement. The pavement replacement surface shall not vary more than 1/4 inch from the lower edge of a straightedge placed across the replacement pavement surface between edges of the existing matched surfaces. When the pavement replacement includes replacement of the roadway crown, the surface smoothness shall comply with requirements of Section 321.

(G) Pavement replacement extending to the edge of asphalt pavement not abutting concrete shall have a safety edge or thickened edge constructed per Detail 201 as deemed appropriate by the local jurisdiction.

For trench cuts, pavement widening, or other partial pavement installations greater than 300 feet in length the entire area shall be slurry seal coated in accordance with Section 332 or as otherwise specified. The seal coat shall extend from the edge of pavement or lip of gutter to the street centerline except that on residential streets less than 36 feet face to face of curb and where the pavement patch straddles the centerline, the entire width of street shall be seal coated.

In lieu of placing the seal coat as required previously, and with approval of the local jurisdiction, the Contractor may deposit with the Street Maintenance Department for credit, a negotiated agreed upon amount. The Street Maintenance Department will incorporate this work into their street maintenance program.

336.2.4.2 Adjustments: When new or existing manholes, valves, survey monuments, clean outs, etc. fall within the limits of the permanent pavement replacement as discussed in this Section, the Contractor shall be responsible for adjusting the various items to the new pavement surface. The Contractor shall coordinate with the Engineer and with representatives of the various utilities regarding the adjustment and inspection of the work. The Contractor shall be responsible for obtaining and complying with all specifications, special requirements, and details for the adjustment of utility company facilities. When adjusting the Agency's utilities, survey monuments, etc., the adjustment will comply with these specifications and details.

The work will be done in compliance with OSHA standards and regulations regarding confined space entry. The Contractor shall remove all material attached to the lids and/or covers including that of prior work. The method of removal shall be approved by the Engineer and/or the Utility Representative.

336.3 TYPES AND LOCATIONS OF TRENCH SURFACE REPLACEMENT:

Trench backfill shall be in place and compacted to the density required in Table 601-2 prior to the placement of the asphalt concrete structural section or other surfacing.

Laying a single course or the base course(s) of the asphalt concrete pavement replacement for trenches shall never be more than 1320 feet behind the ABC placement for the pavement replacement.

Type of surface replacement required for trenches shall be as noted on the plans or special provisions and construction shall be in accordance with Detail 200-1 and 200-2. If a trench repair type is not noted on the plans or specified in the special provisions, the following criteria will govern:

Type A trench repair will be used for all asphalt concrete paved streets where the excavation is essentially longitudinal or parallel to traffic. Full depth longitudinal joints shall not be located within forty-eight inches (48") of an asphalt pavement edge or within a lane wheel path. The lane wheel path for a traffic lane is the entire lane width except the area within one foot of a traffic lane line stripe and except the center two feet of the lane. The lane wheel path for a designated bike lane is the entire lane width except the area within six inches (6") of a bike lane edge stripe. When the surface match point is located within 48" of an asphalt

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pavement edge, all asphalt surfacing shall be removed to the asphalt edge, the replacement surfacing shall extend to the asphalt edge. The traffic lane wheel path restrictions for full depth longitudinal joints do not apply for offset joints that provide at least a six-inch horizontal offset between the surface course joint and the joint in the underlying asphalt layer. The depth of the asphalt surface course shall be equal to or greater than the minimum thickness recommended in Table 710-1.

T-Top trench repair will be used where the excavation is essentially transverse or not parallel to traffic, including trenches that go through an intersection.

Type B trench repair shall only be used when specified by the local jurisdiction.

Type D trench repair will be used to repair surfaces other than asphalt concrete or portland cement concrete pavement. The surface replacement shall be of a like type and depth as the existing material, compacted to the densities required in Section 601.

Where a longitudinal trench is partly in pavement, the pavement shall be replaced to a neat straight line located at the outer limits of the existing pavement.

Where asphalt pavement replacement extends to an uncurbed asphalt edge, the agency designated edge treatment shown in Detail 201 (Type A, Type B, or Safety Edge) shall be installed.

Where a trench is in a landscaped or graded area outside of pavement, no special surface treatment is required except as indicated by plans or specifications.

336.4 MEASUREMENT:

Measurement for surface replacement shall be by the square yard, based on actual field measurement of the area covered except as noted below.

(A) In computing pay quantities for surface replacement of Type B trench repair, the default pay width will be based on the dimension calculated from Table 601-1 for the "Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel". The pay width will be adjusted to the minimum required field width when relocation of the pavement match point is due to the remnant requirement or when pavements less than 4" thick are required to be adjusted outside of a wheel path.

(B) In computing pay quantities for surface replacement of a T-Top or Type A trench repair, the default width will be based on the dimension calculated from Table 601-1 for the "Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel" plus 24 inches. The pay width will be adjusted to the minimum required field width when relocation of the pavement match point is due to the remnant requirement or when pavements less than 4" thick are required to be adjusted outside of a wheel path. In all cases, the minimum pay width for T-Top or Type A surface replacement shall be 48 inches.

(C) In computing pay quantities of surface replacement for Type D trench repair, pay widths will be based on the dimension calculated from Table 601-1 for the "Maximum Width At Top Of Pipe Greater Than O.D. Of Barrel". In all cases, the minimum pay width for Type D surface replacement shall be 48 inches.

(D) Where a longitudinal trench is partly in asphalt pavement, pay quantities shall not exceed actual pavement replacement quantities. The measurement shall be the area as allowed for the respective Type A or Type B trench repair limited to that portion located within the existing pavement. The minimum 48 inch pay width for the Type A pavement replacement does not apply when the trench is partially in pavement.

(E) The length of pavement and surfacing replacement shall be measured through any manhole, valve box, or other structure constructed in the pipe line, and any pavement or surface replacement and/or seal treatment in excess of the trench repair width shall be considered and included in the bid item for such structure.

(F) Any pavement replacement in excess of the specified pay widths necessitated by the installation of valves, tapping sleeves and valves, valve by-passes, and concrete thrust blocks shall be included in the bid price for these items.

SECTION 336

(G) Measurement of pavement and surfacing replacement shall be made along the finished surface excluding any extra replacement required due to Contractor caused damage. The measured quantity shall be computed to the nearest square yard.

(H) No separate measurement or payment will be made for the required construction of a Detail 201 edge treatment.

336.5 PAYMENT:

Direct payment for pavement or other surface replacement will be made for replacement over all pipe trench cuts except as otherwise noted in the special provisions. Payment for surface replacement over other work shall be included in the cost of constructing that work.

Payment for temporary pavement replacement shall be included in the cost of the pipe.

Payment for pavement replacement shall include the replacement cost of any existing pavement markings that have been degraded, obscured, obliterated or removed.

When a Contractor has the option of jacking and/or boring or open cut construction, and elects to construct a pipeline by the jacking and/or boring method, the Contractor will be paid for the replacement of such items of work as pavement, curb and gutter, sidewalk, driveway, and alley entrances, as allowed for open cut construction.

- End of Section -

321.10.3 Surface Testing: If directed by the Engineer surface drainage test shall be performed. The completed surfacing shall be thoroughly compacted, smooth and true to grade and cross-section and free from ruts, humps, depressions or irregularities. An acceptable surface shall not vary more than 1/4 inch from the lower edge of a 12-foot straightedge when the straightedge is placed parallel to the centerline of the roadway. The straightedge shall be furnished by the contractor and shall be acceptable to the Engineer.

All streets shall be water tested for drainage in the presence of the Engineer or designated representative before final acceptance. Any areas not draining properly shall be corrected to the Engineer's satisfaction at the Contractor's expense. Water for this testing shall be provided and paid for by the Contractor.

When deviations in excess of the above tolerance are found, humps or depressions shall be corrected to meet the specified tolerance. ~~or~~ The defective pavement shall be cut out along neat straight lines or for multiple course pavements the surface course may be milled out, and the removed pavement replaced with fresh hot mixture and thoroughly compacted to conform with and bond to the surrounding area. Materials and work necessary to correct such deviations shall be at no additional cost to the Contracting Agency.

When pavement is cut out along neat straight lines, full depth longitudinal joints shall not be located within a lane wheel path or within forty-eight inches (48") of an asphalt pavement edge. Longitudinal joints shall comply with the restrictions for Type A Trench Repairs in Section 336.3.

SECTION 601 TRENCH EXCAVATION, BACKFILLING AND COMPACTION

Section 601.2.7 Last Revised 5/18/2015

601.2.7 Pavement and Concrete Cutting and Removal: Where trenchless methods are not used and trenches or other excavations lie within the portland cement concrete section of streets, alleys, driveways, or sidewalks, etc., such concrete shall be completely removed between the closest adjacent joints. sawcut to Removal methods shall produce neat, straight/vertical, true-lines in such a manner that the remaining adjoining surface concrete will not be damaged. The minimum depth of cut shall be 1 ½ inches or 1/4 of the thickness, whichever is greater.

Sidewalk, curb, gutter, and other concrete flatwork shall have complete joint to joint replacement of all damaged sections. The construction replacing damaged concrete sections and joints shall be compliant with Section 340.

The existing joint system in portland cement concrete pavement (PCCP) shall be maintained. Reconstruction of PCCP panels and joints shall be in accordance with Section 324.

Initial Asphalt pavement removal shall be clean-cut to be the minimum width required for conduit installation and proper trench compaction. No ripping or rooting will be permitted outside the pavement cut limits of cuts. Surfacing materials removed shall be hauled from the job site immediately, and will not be permitted in the backfill.

Final pavement removal for pavement matching and surface replacement shall occur after the final backfill and the aggregate base material are in place and compacted. Pavement matching and final surface replacement shall be with approved equipment and by approved methods in accordance with the requirements of Section 336.

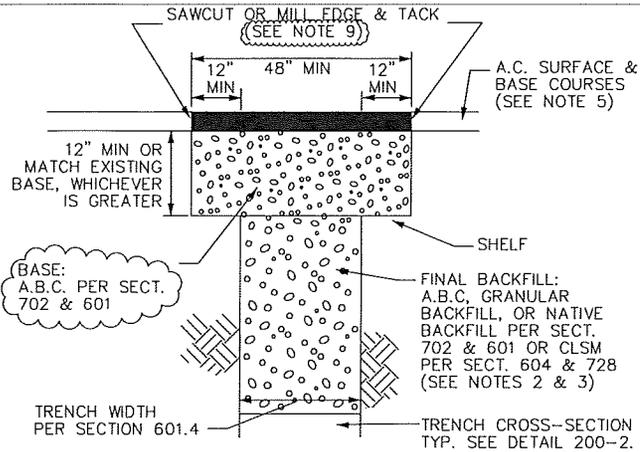
~~No ripping or rooting will be permitted outside limits of cuts. Surfacing materials removed shall be hauled from the job site immediately, and will not be permitted in the backfill.~~

Section 601.2.10 Last Revised 3/19/2015

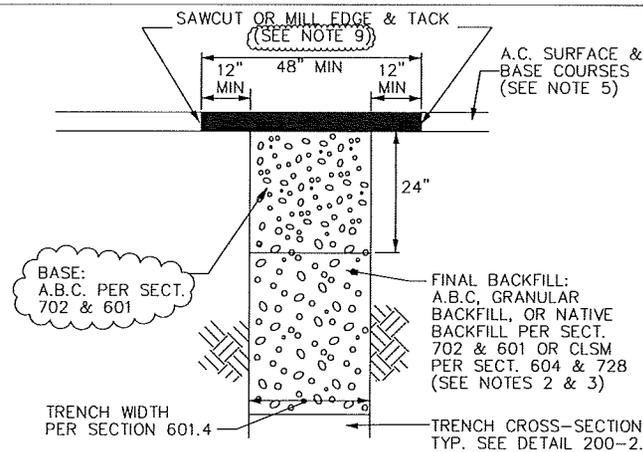
601.2.10 Open Trench: Except where otherwise noted in the special provisions, or approved in writing by the Engineer, the maximum length of open trench, where the construction is in any stage of completion (excavation, pipe laying or backfilling), shall not exceed 1320 feet in the aggregate at any one location.

Any excavated area shall be considered open trench until all ABC for pavement replacement has been placed and compacted. With the approval of the Engineer, pipe laying may be carried on at more than one location, the restrictions on open trench applying to each location. Trenches across streets shall be completely backfilled as soon as possible after pipe laying.

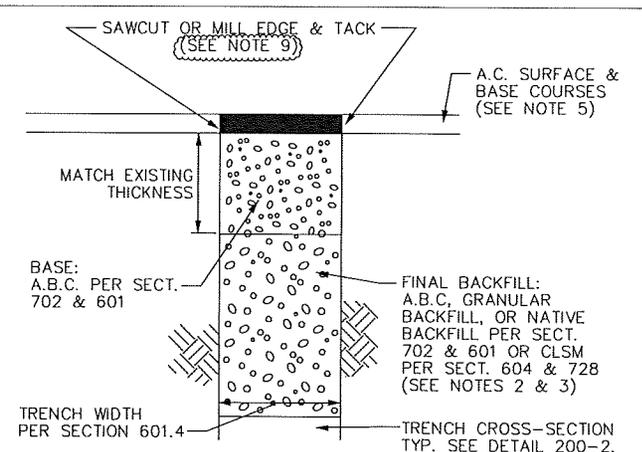
Substantial steel plates with adequate trench bracing shall be used to bridge across trenches at street crossings where trench backfill and temporary patches have not been completed during regular work hours. Steel plates shall be installed in accordance with Detail 211. Safe and convenient passage for pedestrians shall be provided. The Engineer may designate a passage to be provided at any point he deems necessary. Access to hospitals, fire stations and fire hydrants ~~must shall~~ be maintained at all times. Steel plates with adequate trench bracing shall be used to bridge across trenches as needed to provide driveway access to adjacent properties where trench backfill and temporary patches have not been completed during regular work hours.



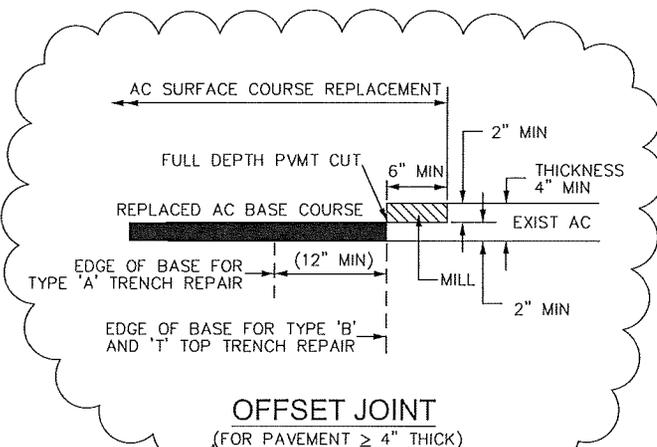
"T TOP" TRENCH REPAIR



TYPE "A" TRENCH REPAIR

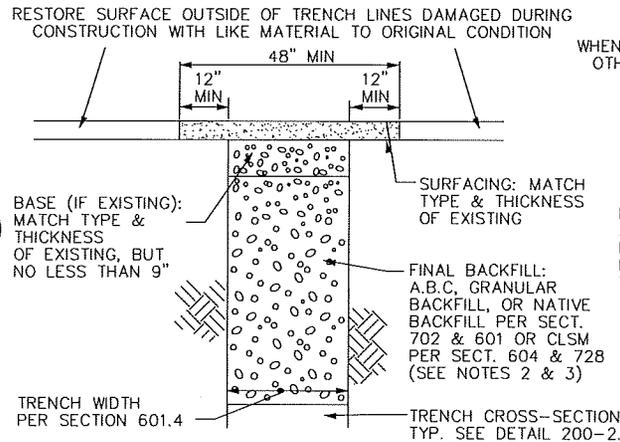


TYPE "B" TRENCH REPAIR



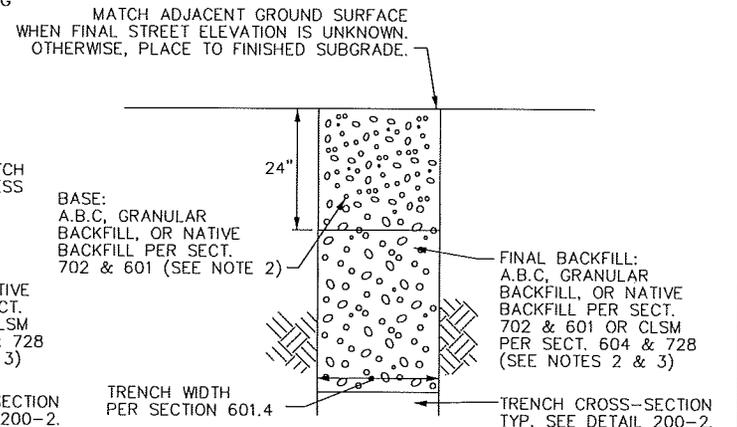
OFFSET JOINT

(FOR PAVEMENT ≥ 4" THICK)



TYPE "D" TRENCH REPAIR

(TRENCH NOT UNDER CONCRETE OR ASPHALT PAVEMENT)



TYPE "E" TRENCH REPAIR

(TRENCH IN FUTURE ROADWAY PRISM OR ALLEY)

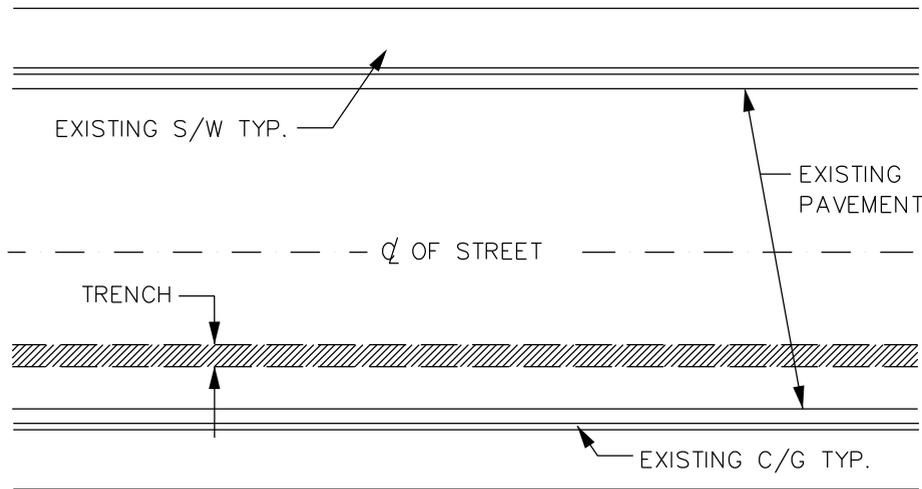
NOTES:

- PAVEMENT MATCHING AND SURFACE REPLACEMENT SHALL BE IN ACCORDANCE WITH SECTION 336.
- MATERIAL FOR FINAL BACKFILL AND BASE (IF APPLICABLE) SHALL BE AS NOTED HEREIN UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS. CLSM SHALL BE 1/2-SACK OR 1-SACK PER SECTIONS 604 AND 728.
- FINAL BACKFILL SHALL BE 1/2-SACK OR 1-SACK CLSM PER SECTIONS 604 AND 728 FOR TRENCH DEPTHS GREATER THAN 4 FEET UNLESS A SAFE (OHS COMPLIANT) WORKING SPACE AT LEAST 30" WIDE IS PROVIDED TO CONDUCT COMPACTION TESTING.
- BASE, FINAL BACKFILL, AND PIPE EMBEDMENT ZONE COMPACTION SHALL BE IN ACCORDANCE WITH SECTION 601.
- ASPHALT CONCRETE SURFACE AND BASE COURSES SHALL COMPLY WITH SECTION 336.2.4.1 UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS.
- USE TYPE "A" FOR LONGITUDINAL TRENCH REPAIR AND USE "T-TOP" FOR TRANSVERSE TRENCH REPAIR (SEE DETAIL 200-2) UNLESS OTHERWISE SPECIFIED IN CONTRACT DOCUMENTS. TYPE "B" TRENCH REPAIR MAY BE USED FOR TRANSVERSE TRENCH REPAIR IF SPECIFIED BY THE AGENCY.
- PROVIDE MINIMUM 12" WIDE SHELF AS SHOWN IN "T-TOP" TRENCH REPAIR AT ENDS OF TYPE "A" TRENCH REPAIR EXCEPT WHERE EDGE ABUTS EXISTING CONCRETE.
- USE "T-TOP" PAVEMENT REPLACEMENT WHERE A TRENCH IS NOT PARALLEL TO A STREET OR GOES THROUGH AN INTERSECTION.
- THE JOINT LOCATION OR JOINT CONFIGURATION MAY VARY FROM THAT SHOWN TO ELIMINATE REMNANTS, TO ELIMINATE FULL DEPTH SAWCUT JOINTS FROM BEING LOCATED WITHIN A WHEEL PATH AS REQUIRED BY SECTION 336, OR WHEN AN OFFSET JOINT IS CONSTRUCTED.
- SEE DETAIL 200-2 FOR REMNANT PAVEMENT REMOVAL REQUIREMENTS.
- EXPOSED COPPER OR POLYETHYLENE WATER PIPE UP TO 2" IN DIAMETER IN TRENCHES TO BE BACKFILLED WITH CLSM SHALL BE WRAPPED WITH MINIMUM 3/4" THICK PREFORMED PIPE-COVERING FOAM INSULATION BEFORE PLACING CLSM.

DETAIL NO. 200-1	MARICOPA ASSOCIATION of GOVERNMENTS	STANDARD DETAIL ENGLISH	TRENCH BACKFILL AND SURFACE REPLACEMENT	PROPOSED 01-01-2015	DETAIL NO. 200-1
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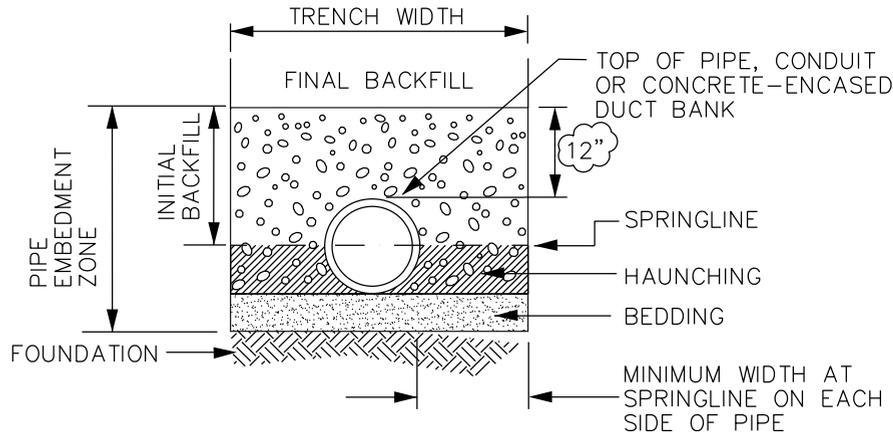
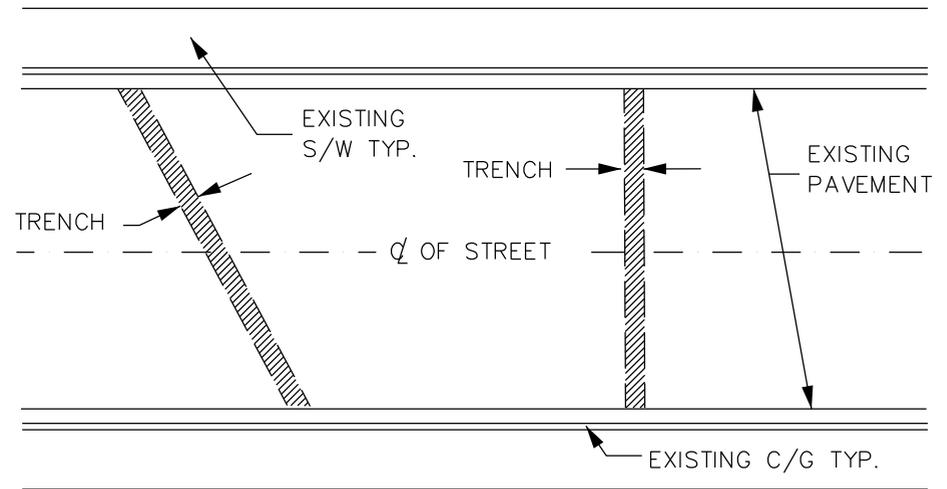
LONGITUDINAL TRENCH

(TRENCH IN PAVEMENT PARALLEL TO TRAFFIC)

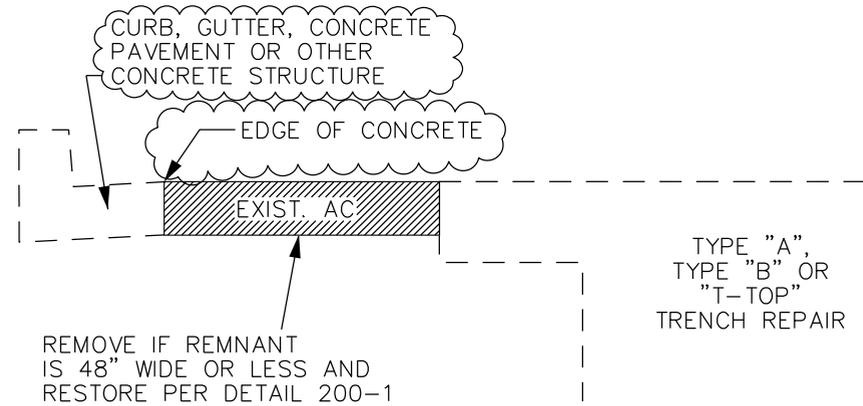


TRANSVERSE TRENCH

(TRENCH IN PAVEMENT NOT PARALLEL TO TRAFFIC)



TRENCH CROSS-SECTION DETAIL



REMNANT PAVEMENT REMOVAL

NOTES:

1. SEE SECTION 601 FOR TRENCH EXCAVATION, BACKFILLING AND COMPACTION REQUIREMENTS.
2. SEE DETAIL 200-1 FOR DETAILED TRENCH REPAIR REQUIREMENTS FOR TRENCH TYPES NOTED HEREIN.
3. SEE DETAIL 211 FOR REQUIREMENTS REGARDING THE USE OF PLATING TRANSVERSE TRENCHES. USE OF STEEL PLATES SHALL NOT EXCEED 72 HOURS AFTER COMPLETION OF BACKFILL AND PRIOR TO FINAL PATCHING.

DETAIL NO.
200-2



STANDARD DETAIL
ENGLISH

**TRENCH BACKFILL AND
SURFACE REPLACEMENT**

PROPOSED
01-01-2015

DETAIL NO.
200-2