

**Construction Specification for
Utility Cut and Restoration**

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TS 4.60.01 SCOPE

This specification covers the requirements for utility cutting, excavating, backfilling, and repair of City streets.

TS 4.60.02 REFERENCES

This specification refers to the following standards, specifications or publications:

City of Toronto Standard Specifications

TS 1.00	Construction Specification for Maintenance of Traffic
TS 3.40	Construction Specification for Concrete Road Base
TS 3.45	Construction Specification for Repair of Concrete Pavement and Base
TS 3.50	Construction Specification for Concrete Curb and Concrete Curb and Gutter
TS 3.70	Construction Specification for Concrete Sidewalk and Concrete Raised Median
TS 4.70	Construction Specification for Keyhole Excavation and Permanent Reinstatement of Keyhole Cores
TS 5.00	Construction Specification for Sodding
TS 5.10	Construction Specification for Growing Medium
TS 13.10	Construction Specification for Unshrinkable Fill
TS 310	Construction Specification for Hot Mixed, Hot Laid Asphaltic Concrete Paving
TS 501	Amendment to OPSS.MUNI 501 – Construction Specification for Compacting
TS 1010	Amendment to OPSS.MUNI 1010 – Material Specification for Aggregates – Base, Subbase, Select Subgrade, and Backfill Material
TS 1350	Amendment to OPSS.MUNI 1350 – Material Specification for Concrete – Materials and Production

City of Toronto Standard Drawings

T-508.010-1	Anchored Hook Bolt Dowel and Concrete Repair
T-509.010-1	Composite Pavement Patching for Utility Cuts (Sheet 1 of 2)

City of Toronto Publications

MCR	Municipal Consent Requirements
	Tree Protection Policy and Specifications for Construction Near Trees
	Utility Cut Repair Guidelines

Ontario Provincial Standard Specifications

OPSS 180	General Specification for the Management of Excess Materials
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Ontario Ministry of Transportation

Ontario Traffic Manual Book 7 Temporary Conditions

American Concrete Pavement Association

Utility Cuts in Concrete Pavements

TS 4.60.03 DEFINITIONS

For the purpose of this specification, the following definitions apply:

12-Bag Mix means a type of concrete containing 480 kilograms of cement in one cubic metre of volume which yields to properties that allow the concrete road base to gain sufficient strength in 4-hours and receive an asphalt layer on the top for quick reopening of traffic lanes. This material only to be used for the permanent restoration of utility cuts.

Applicant means a person applying for a permit or other consent to cut a street. This shall be extended, where applicable, to include the Applicant's direct employees and its agents, consultants and contractors.

Boulevard means that part of a public street that is not used, or intended to be used, for vehicle travel by the general public, and that is situated between the travelled portion of the road and the adjoining Property line.

Contraction Joint means a cut or formed joint to regulate the location and degree of cracking in the plane of the pavement.

Deep trench means a trench deeper than 1.2 m.

Emergency Work means work within a street that must be completed immediately due to health or safety concerns or because the provision of essential services is endangered.

Essential Services means energy (including natural gas, steam, and electricity), water, sanitary sewage, traffic control, and the following communication services: 911 service; communications for financial transactions; business networks; and Internet.

Excavating means the breaking, digging up, tearing up, tunneling, boring, coring, cutting into or removing any portion of the surface or subsurface of the street, including pavement, sidewalk, curbs, gutter or landscaping.

Expansion Joint means a physical separation between the concrete and appurtenances, or between parts of the sidewalk or raised median, which allows both horizontal and vertical movement.

City means the City of Toronto.

General Manager means the General Manager of Transportation Services for the City of Toronto and his or her designate or successor.

Municipal Consent Requirements (MCR) means the document specifying the requirements for the installation of plant within city of Toronto streets.

Narrow trench means the width of a trench is less than or equal to 350 mm.

Native Material means excavated material for placement into the exact location from which it was removed.

Shallow trench means the depth of trench is less than or equal to 1.2 m.

Permanent Repair means the process whereby a cut and/or excavation is reinstated to a condition which requires no further repair.

Plant means any poles, cables, pipes, conduits, ducts, pedestals, regulators, antennas, towers, wires, amplifiers, vaults, maintenance holes, hand holes, support structures and or other appurtenances or ancillary facilities or structures used for the provision of telecommunications, internet, energy, water, waste water, steam, fuel and/or other materials. Any encasement, steel plating or other non-excavatable material shall be considered to be part of the plant.

Road means the portion of the street designed, improved and ordinarily used by vehicle traffic. The terms pavement and roadway shall have the same meaning as road.

Sidewalk means that part of a public street located within the Boulevard that is improved for the exclusive use of pedestrians.

Street means a common and public highway, street, avenue, parkway, driveway, square, place, bridge, viaduct or trestle, any part of which is intended for or used by the general public for the passage of vehicle and includes the area between the lateral property lines thereof. The terms City's public road allowance, right-of-way and highway shall have the same meaning as street.

Suitable Backfill Material means the native materials or imported granular materials that can be used as utility trench backfill materials in lieu of unshrinkable fill.

Temporary Repair means the process whereby a cut and/or excavation is reinstated as a temporary measure pending completion of a permanent repair.

Tree Protection Zone means the area of the tree roots must be protected during construction according to Tree Protection Policy and Specifications for Construction Near Trees.

TTC means the Toronto Transit Commission

Unshrinkable Fill means a mixture of aggregates, cementing material and water, with or without chemical admixtures, according to TS 13.10.

Utility Company means a company owning, operating and maintaining plant in the public right-of-way.

Wide trench means a trench wider than 350 mm.

TS 4.60.04 DESIGN AND PERMIT REQUIREMENTS

For submission and permit requirements to make an installation within the City streets refer to the Municipal Consent Requirements:

TS 4.60.05 MATERIALS

TS 4.60.05.01 Supply of Materials

The Applicant / Contractor shall supply all materials necessary for the execution and completion of the work.

TS 4.60.05.02 Unshrinkable Fill

The materials for the production of unshrinkable fill shall be according to TS 13.10.

The supplied unshrinkable fill may be tested, and any material that does not meet the requirements of TS 13.10 shall be removed and replaced at the Contractor's expense. All costs associated with the removal and replacement of deficient unshrinkable fill shall be borne by the Applicant / Contractor, including the cost of administration and retesting.

Temporary plating shall be used to support loads from pedestrian and vehicular traffic until the temporary asphalt is laid. Traffic shall not be permitted to travel directly onto the surface of the unshrinkable fill.

TS 4.60.05.03 12-Bag Mix Concrete

The materials for the production of 12-bag mix concrete shall be according to TS 3.40.

TS 4.60.05.04 Suitable Backfill Materials

TS 4.60.05.04.01 *Imported Granular Materials*

Granular materials – free of RAP; reclaimed asphalt pavement – may be imported for use as trench backfill provided the imported materials shall be according to TS 1010.

TS 4.60.05.04.02 *Existing Material in Trench*

Materials excavated during trench construction may be considered for reuse as trench backfill where permitted under clause 4.60.07.02.03, herein. The materials shall have suitable physical and environmental properties; and the materials should be properly managed during construction. The excavated materials that may be considered for reuse as backfill include either a suitable existing granular material or a suitable existing cohesive material. The physical properties of the materials shall meet the following requirements:

- a) the material is free of any obvious objectionable or deleterious materials such as topsoil, organics, wood chips, reclaimed asphalt pavement and metal pieces if the material is to be used in trenches located under a pavement

Note: Material containing topsoil, organics, or wood chips, is acceptable when backfilling within sodded or soil surfaces in the boulevard.

- b) the material is free of large pieces of rock or boulders
- c) the material is free of shale pieces

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- d) the compaction equipment deployed on site is able to compact the material to its required density
 - e) the material is not considered to be frost susceptible
 - f) the material is not wet, frozen or lumpy

All excavated materials to be reused as trench backfill shall be managed to prevent contamination, and shall be protected to preserve or maintain its moisture condition.

Where the excavated material has been identified to be contaminated, the Contractor shall comply with all applicable legislation. Contaminated soil shall not be used as backfill and shall be disposed of off-site according to the applicable requirements.

When the suitability of excavated material for reuse is in dispute, the City, in its sole discretion, shall determine the suitability of the material based on the physical properties mentioned in this section and as recommended in a report, submitted by the Applicant, from a geotechnical consultant.

TS 4.60.06 EQUIPMENT – Not Used

TS 4.60.07 CONSTRUCTION

Table 1: Repair responsibility according to surface types

Surface type	Material	Repair responsibility	
		Temporary repair	Permanent repair
road pavement	asphalt	Applicant	Applicant
	concrete	Applicant	Applicant
sidewalk	asphalt	- - -	Applicant
	concrete	Applicant	Applicant
curb	asphalt	- - -	Applicant
	concrete	Applicant	Applicant
boulevard	asphalt	- - -	Applicant
	concrete	Applicant	Applicant
	interlocking bricks/flagstone on a granular base	- - -	Applicant
	interlocking bricks/flagstone on a concrete base	Applicant	Applicant
	sod	- - -	Applicant
	gravel or soil	- - -	Applicant
driveway	asphalt with abutting concrete repair	Applicant	Applicant
	asphalt with no abutting concrete repair	Applicant	Applicant
	concrete	Applicant	Applicant
	interlocking bricks/flagstone on a granular base	- - -	Applicant
	interlocking bricks/flagstone on a concrete base	Applicant	Applicant

Notes: Any repairs on private property shall be the responsibility of the Applicant.

All work performed by the Applicant or its contractor shall be carried out according to City standards and specifications.

Restoration of areas with decorative or specialized surfaces, landscaping, and subsurface treatments such as patterned / impressed concrete, snow melting systems, sprinkler systems, granite pavers and so forth shall be the responsibility of the Applicant.

Where interlocking bricks/flagstone on a granular base are adjacent to sidewalk that must be replaced as a result of the Applicant's work, the City will remove and relay the interlocking bricks/flagstone at the Applicant's expense as part of the restoration work.

TS 4.60.07.01 General

Where keyhole excavation is being proposed to complete utility installations or repairs or both, the work shall be carried out according to TS 4.70.

TS 4.60.07.02 Installation of Plant

TS 4.60.07.02.01 *Sawcutting of Pavement, Sidewalk, Curb and Driveway*

Unless judged unfeasible, the sawcut area shall have a maximum of four sides that are all parallel or perpendicular to the direction of travel. Sawcuts shall be straight and vertical to the full depth of the asphalt and concrete layers of the pavement.

Sawcutting operations shall be performed with suitable equipment and methods and not with heavy machinery or jackhammers that may cause damage to the surrounding road.

Saw cutting shall stop at, or just short of, corners to avoid overcutting. After sawcutting the edges, removal of pavement materials shall be performed with care to avoid lifting and breaking the road pavement beyond the sawcut borders.

Sawcutting of TTC surface track structure, including track base, shall not be permitted without the written consent of the TTC.

TS 4.60.07.02.02 *Excavation*

During the installation of any Plant, excavation equipment with stabilizers shall be suitably outfitted to prevent damage to the pavement surface or else wood or rubber pads shall be placed on the road to support the stabilizers. Any damage to the street attributable to the Applicant's work shall be repaired, at the Applicant's expense, in conjunction with the utility cut.

Excavation shall not extend beyond the limits of the sawcut area. Care is to be taken to ensure that undermining of the adjacent pavement, curb and sidewalk is minimized. Where the pavement, curb and/or sidewalk are undermined by construction activities or from other causes, these undermined areas shall be filled and the settled structures shall be restored to their original grades at the expense of the Applicant.

Where necessary, bracing, shoring and/or sheeting shall be according with any occupational health and safety regulations, to support the sides of the excavation and to prevent any movement that could damage other services, adjacent pavements, sidewalks and so on. This excavation support system shall be removed as backfilling proceeds to eliminate voids between the fill and adjacent soils. Appropriate restoration of all displaced services to their original positions is the responsibility of the Applicant.

The Applicant / Contractor shall, at its own expense, provide adequate support and protection of the underground and above ground plant and structures that exist inside the excavation and in the vicinity of the excavated area. Any damage to plant or structures attributable to the Applicant / Contractor's work shall be repaired to the satisfaction of the City and/or the owner(s) of the damaged plant or structures, at the Applicant / Contractor's expense, in conjunction with the utility cut.

Except where native cohesive material is to be used for backfill, as permitted by the City and/or under the conditions of this specification, stockpiling of excavated material within City Streets is not permitted under any circumstances for any length of time. All excavated material shall be loaded directly into appropriate haulage trucks and disposed of off-site immediately upon removal. The Applicant shall remove, transport and dispose of all excavated materials in accordance with the latest *Ontario Environmental Protection Act* and, where appropriate, the *Occupational Health and Safety Act*.

All excavations shall have a minimum horizontal clearance of one metre from the edge of a TTC surface track structure, including track base, unless otherwise authorized by written consent from the TTC.

All tunnelling shall maintain a minimum vertical clearance of 500 mm below the TTC track structure including granular sub base, all concrete construction, and, where present, track subdrains.

Inspection of Excavation

Prior to backfilling, the Applicant shall inspect the utility cut excavation to ensure the following requirements are met:

- a) the edges of the pavement have been saw cut in a straight line and to the full depth of the pavement, or if permitted, to partial depth in composite pavement
- b) the bottom of the trench has been compacted and is free of water before the bedding material is placed
- c) all loose or wet material at the bottom of the trench has been removed and replaced with suitable bedding materials
- d) pipe bedding and pipe cover materials are free of reclaimed asphalt and compaction of the bedding and cover have been carried out to City's or utility agency's requirements
- e) necessary shoring/bracing meeting *Ontario Occupational Health and Safety Act* and regulations has been used to prevent the trench from cave-in and to protect adjacent services, pavement and sidewalk
- f) undermining of the adjacent pavement and sidewalk has been prevented/repaired.

Excavation near Trees

Refer to the City's Tree Protection Policy and Specifications for Construction Near Trees.

Protection of Excavation

All excavations must be backfilled to match the adjacent grade or properly protected at the end of each working day.

When temporary steel plates are used to maintain vehicular, bicycle and pedestrian traffic flow, the plates shall have a skid resistant surface treatment and shall be fastened down to prevent moving. The plates shall be set flush with the surface of the pavement. The recessed plates should overlap the cut by no less than 300 mm on all sides. Asphalt mix shall be used to fill the voids on the outside edges of the plates.

Plates shall be used only as a temporary measure during construction and shall not be used for extended periods of time.

TS 4.60.07.02.03 *Backfilling*

Bedding and covering material shall be compacted to at least 98% of standard proctor maximum dry density, or according to the Applicant's installation requirements, whichever is greater.

If unshrinkable fill is used, backfill trench with unshrinkable fill to within 80 mm of the top of the existing surface.

If temporary shoring or bracing has been used to support adjacent infrastructure, it shall be removed in a safe manner continuously as backfilling proceeds.

Backfilling in Pavements

If suitable backfill material is to be used, backfilling shall be carried out in uniform lifts not exceeding 150 mm loose thickness with the layer thickness decreased to 100 mm around obstacles. Each lift of suitable backfill material shall be compacted to a minimum of 98% of standard proctor maximum dry density, or in accordance with the Applicant's utility agency installation requirements, whichever is greater.

For temporary restoration of pavements, suitable backfill materials shall be brought to within 80 mm of the top of the existing surface.

The type of backfilling required in utility cuts made in road pavements shall be as follows:

- a) Unshrinkable fill shall be used for all cuts made in road pavements unless otherwise approved by the City.
- b) The City, in its sole discretion, may allow an Applicant to apply, in writing, for an exemption from using unshrinkable fill where a utility cut is to be located at the shoulder area or for backfilling of a wide and deep trench. No such exemptions will be granted on roads for reconstruction or resurfacing within the current construction season as advised by the City.
- c) Where an exemption from using unshrinkable fill has been granted, the Applicant or its Contractor shall provide Geotechnical Certificates from a geotechnical consultant within 30 days of completion of work certifying that the trench backfill meets the backfill materials requirements and compaction requirements as specified in this specification.
- d) Where suitable native backfill is used, a 400 mm layer of Granular A, compacted to 98% of maximum dry density, shall be placed immediately below the asphalt in flexible pavements and immediately below the concrete base in composite pavements.

Backfilling in Boulevards

The use of unshrinkable fill is strictly prohibited for backfilling in boulevards except in the following two scenarios:

- 1) Where cuts are in close proximity to the road and the limits of the excavation encroach into the 1H:1V structural prism commencing from the bottom of the adjacent curb, unshrinkable fill shall be used within the envelope of the structural prism; or
- 2) Where cuts are made in hard surfaces such as curbs, public sidewalks, concrete driveways, and interlocking bricks/flagstone on a concrete base that are immediately adjacent to the road, unshrinkable fill shall be used under these hard surfaces.

Where an excavation extends beyond the areas described above, the Applicant / Contractor shall ensure that the unshrinkable fill is contained within the appropriate area.

Note: Notwithstanding the above, unshrinkable fill is strictly prohibited for any excavation within a Tree Protection Zone (TPZ) regardless of the surface treatment.

For areas of sod or soil, see clause TS 4.60.07.04.05, herein.

For all boulevard areas other than those specifically described above, only suitable native material or Granular B Type II shall be used. Backfill materials shall be placed in lifts not exceeding 200 mm loose thickness and each lift shall be compacted to 95% of standard proctor maximum dry density. Permanent restoration of sodded area shall be performed according to TS 5.00.

Backfilling in Tunnels

Any facility that is placed underground in any method other than open cut trenching shall be considered as tunnelling.

In backfilling a tunnel, the final density of the backfill must match or exceed that of the surrounding soil. All voids resulted from tunnelling shall be completely backfilled using suitable materials as defined in this specification.

TS 4.60.07.03 Temporary Repair

Backfill material shall be brought to within 80 mm below the existing surface. The remainder of the trench shall be filled with compacted hot mix asphalt as a mean for temporary pavement restoration.

All temporary repairs shall be Superpave 12.5, Traffic Category B, PG 58-28 hot mix asphalt. The Superpave 12.5, Traffic Category B, PG 58-28 shall be mechanically compacted according to TS 310 and neatly match the finished grade of the existing pavement or sidewalk. Prior to placement of the asphalt, all faces, including vertical saw cut surfaces, shall be tack coated using SS-1 emulsified asphalt or equivalent.

Temporary utility cut repairs shall be stenciled by the Applicant with a 75 mm x 75 mm thermoplastic identifier logo. The colour of the logo shall be according to the unique colour assigned for the Applicant.

No permanent repairs shall be carried out between November 1st to May 1st of the calendar year.

TS 4.60.07.04 Permanent Repair

TS 4.60.07.04.01 *Extent of Permanent Restoration*

Notwithstanding the following, the nature and extent of the required reinstatement of the cuts will be at the sole discretion of the City based upon field assessment of the section of roadway prior to the permanent reinstatement.

TS 4.60.07.04.01.01 *Pavement*

Wherever a utility cut is parallel to and coincides with a wheel path, the cut shall be extended to include the wheel path.

If a utility cut is located within one metre of a curb or construction joint, such that the integrity of the adjacent pavement/base may be compromised, the permanent restoration will include the removal of the adjacent road base to the edge of the curb or construction joint. In all cases, the permanent repairs shall match the cross-section of the adjacent pavement.

Where keyhole cores are densely located in one area, less than 2 m apart, they will be treated as a trench cut.

Pavements with extensive trenching or numerous cuts may require milling and paving to address one or more of the following issues: to restore the quality of the driving surface; to eliminate visual impact of significant road cutting; and/or to better preserve the service-life of a pavement that has experienced excessive cutting.

For longitudinal trenches, whether in the wheel path or otherwise, the affected lane will be milled and paved for the length of the trench plus an additional 5 m at either end of the trench. If however, the total length of all trenches within a street block is: equal to or greater than 75 per cent of the block's length (for block lengths exceeding 250 m) or equal to or greater than 60 per cent (for block lengths less than or equal to 250 m), then the total length of the block will be milled and paved, that is to say between block intersections.

Milling of the surface course, in any of the aforementioned cases, will be a minimum of 3 m width in order to accommodate the placement of the asphalt surface course with a mechanical spreader.

If the longitudinal trench affects two lanes, then both lanes will be milled and paved for lengths defined above.

Where a series of transverse cuts, pits or shafts occur in close proximity along a roadway—that is within 12 m of each other or less—with a flexible pavement structure, the permanent restoration will include milling of the asphalt surface to a depth of 40 mm for the full width of the lane (or to a minimum width of 3 m) to accommodate the placement of hot-mix asphalt using a mechanical spreader.

Where a series of transverse cuts, pits or shafts occur in close proximity along a roadway—that is within 12 m of each other or less—with a composite pavement structure, the concrete road base shall be restored and the asphalt surface shall be milled to a depth of 40 mm for the full width of the lane or lanes, as the case may be, (or to a minimum width of 3 m) to accommodate the placement of hot-mix asphalt using a mechanical spreader.

Transverse Cuts

If there are multiple transverse cuts and the distance between trenches is less than or equal to 12 metres, then continuous milling and paving of the transverse cuts shall be performed.

For every transverse grind and pave, allow 5 metres on each end of permanent repair trench.

TS 4.60.07.04.01.02 *Sidewalk and Curb*

Wherever a side of a cut falls between expansion joints, the removal and subsequent restoration shall be extended to the nearest expansion joint.

Where the concrete sidewalk is monolithic with the curb, the sidewalk and the curb shall be cut and removed as a unit.

Wherever space for concrete forms are required to perform sidewalk or curb repairs adjacent to an existing driveway or pavement, the Contractor shall saw cut the driveway or pavement neatly parallel to the sidewalk or curb.

TS 4.60.07.04.01.03 *Driveway*

The surface asphalt restoration shall be extended 300 mm on all sides of the cut.

If the edge of the restoration area is less than or equal to one metre from the nearest edge of the driveway or edge of a previously repaired cut, the restoration area shall be extended to that edge.

Whenever the restoration area is more than half of the width of the driveway, the restoration shall be extended to include the entire width of the driveway.

Whenever a cut of any size is made in the driveway apron—the area between the edge of sidewalk and the back of curb—the entire area shall be restored.

The Applicant may request an exemption from this requirement by demonstrating that site-specific existing conditions warrant a reduced level of restoration. Any exemption shall be at the sole discretion of the City.

TS 4.60.07.04.02 *Permanent Repair to Utility Cut Surfaces*

All permanent repairs to utility cut surfaces that include sidewalks, curbs, boulevards, and driveways shall be constructed to meet the current City standards and to match the material and thickness design of the structure.

The permanent reinstatement for a roadway pavement structure that consists of asphalt over granular base/subbase—flexible pavement structure—or asphalt over concrete road base—composite pavement structure—shall be constructed to match the material and thickness design of the existing structure.

The Superpave mix to use for utility cut repairs when asphalt will be hand laid shall be according to Table 2.

Table 2: Superpave mix selection for any hand laid jobs

Surface type	Laneway	Local	Collector	Minor Arterial	Major Arterial
Surface Course		SP 12.5 B PG 58-28		SP 12.5 FC 1 C PG 58-28	
Base Course			SP 19.0 D PG 58-28		

Utility cuts backfilled with suitable native backfill material or imported materials will typically be subjected to one full freeze-thaw cycle before permanent repairs are completed.

All hot-mix asphalt materials shall be supplied and placed in according to TS 310. Prior to placement of the asphalt layers, the existing pavement shall be tack coated using SS-1 emulsified asphalt or equivalent. The perimeter of the permanent restoration shall be routed and sealed with a bead of rubberized asphalt.

TS 4.60.07.04.03 *Placing Asphalt for Permanent Repair*

In addition to TS 310 the following shall be adhered to:

Before asphalt is laid, the aggregate base shall be inspected and locations with loose material shall be re-compacted to the recommended density level. Whenever space permits, a steel roller with vibration capability shall be used on the final surface of the aggregate base. Caution shall be exercised in moving the equipment into the trench to avoid damage to the edges of the road. Prior to placement of the asphalt, the vertical faces of the saw cut shall be tack coated using SS-1 emulsified asphalt or equivalent.

The hot mix asphalt delivered to site shall be visually inspected and removed if the hot mix asphalt is non-uniform, lean or dry characterized by brown colour and fat or over-asphalted recognized by sticky or greasy appearance.

The temperature of the hot mix asphalt delivered to site shall be checked with an appropriate temperature-measuring device. Any hot mix asphalt with temperature that has fallen below 120°C at the point of discharge before spreading shall be rejected.

Asphalt shall be laid in lifts of 50 mm or less. Each lift shall be thoroughly compacted by the suitable compaction method and allowed to cool to 50°C before the next lift is laid on top. Density check shall be carried out using a nuclear gauge device. Coring is to be used only in case of doubt or disagreement or both about the accuracy of measurements made by the nuclear gauge.

After compaction, the hot asphalt surface shall be protected from the potential for accumulating excessive deformation. Cuts restored using hot mix asphalt should be protected from direct traffic for enough time to gain adequate strength before allowing traffic on the restored cut. Lanes affected by the cut are kept closed to traffic until the temperature of the air-cooled asphalt drops below 40°C. Alternatively, whenever safety considerations allow, the hot asphalt surface should be covered with steel plates until the temperature of the asphaltic concrete layer drops below 40°C.

Regardless of the thickness of the asphalt found in the existing road, proper asphalt thickness shall be re-laid without compromising cross-fall drainage requirements of the road. All construction joints of the cut shall be sealed with a joint sealant to impede the flow of surface water to the cut.

TS 4.60.07.04.04 *Permanent Restoration of Cuts in Composite Pavements*

Where the existing roadway pavement structure consists of an asphalt concrete surface over concrete base (composite pavement structure), the pavement reinstatement shall be completed according to TS 3.45.

The aggregate base upon which the concrete is poured shall be free of ice and snow, and shall not be frozen.

When permanent restoration is performed on concrete composite pavement, the asphaltic concrete and Portland cement concrete layers of the road shall be cut back beyond the intended cut width to a minimum of 300 mm on each side. Cutting shall only be performed after backfilling of the utility trench reaches the level of the bottom of the concrete slab. The T-section configuration facilitates bridging of backfill layers in the cut where the concrete slab transmits critical levels of traffic-induced stresses directly to the undisturbed granular road base next to the trench.

If inspection of the cutback revealed that the granular road base in the cutback section is undisturbed, the two ends of the concrete slab should rest directly on top of the existing granular base of the road. The granular base layer in the cut shall be constructed at the same level of the road granular base for the cut structure to benefit from load distribution facilitated by this T-section design configuration.

If the road base material is disturbed during cutting, excavation or construction of layers below the concrete base, or if there is no granular base in the road structure, an additional 150 mm depth shall be excavated from the road as part of the cut back and backfilled with compacted Granular A.

The concrete slab shall be allowed to cure for a minimum of seven days in order to reach its specified strength before the road is allowed to reopen to traffic. High early strength concrete shall be used if the road is expected to reopen to traffic in less than seven days. 12-bag mix concrete shall be used if the road is expected to reopen to traffic after four hours.

TS 4.60.07.04.05 *Permanent Restoration of Cuts in Sodded Areas*

Sod shall not be laid when ground is in a frozen condition or when the site is in adverse conditions such as high wind, frozen soil or soil covered with snow, ice or standing water.

All surface areas designated for sodding shall be fine graded to a uniform surface to meet all design requirements. The surface shall be uniformly cultivated according to TS 5.00.

The Applicant or its contractor shall:

- Carry out regular inspection of utility cuts during a 2-year warranty period.
- Immediately correct any and all settlements during the 2-year maintenance warranty period.
- Maintain the sod according to subsection 5.00.07.05 of TS 5.00.

TS 4.60.07.05 Traffic Control

Compliance with all City traffic control standards, including the latest editions of the Ontario Traffic Manual Book 7 and the Municipal Consent Requirements is required

TS 4.60.07.06 Management and Disposal of Excess Materials

Management and disposal of excess material shall be according to OPSS 180.

TS 4.60.08 QUALITY ASSURANCE

The quality assurance requirements for all materials used for the temporary and permanent utility cut restoration shall be in full conformance the quality assurance requirements specified for the respective materials:

- The supply and placement of unshrinkable fill shall be according to TS 13.10.
- The supply and placement of concrete shall be according to TS 3.40, TS 3.45, TS 3.50, TS 3.70, and TS 1350.
- The supply and placement of hot mix, hot laid asphalt shall be according to TS 310.

The supply and placement of aggregates and backfill materials shall be according to TS 1010.

TS 4.60.08.01 Warranty

The Applicant will warrant the utility cut repairs it undertakes in accordance with the repair responsibility—Table 1 in TS 4.60.07—for 2-years. The Applicant shall maintain a rigorous control and assurance program such that each utility cut repair will be inspected once every 12 months, during the warranty period.

TS 4.60.09 MEASUREMENT FOR PAYMENT

TS 4.60.09.01 Restoration

Where the permanent restoration of the utility cut is not included in the any items, the measurement of the restored area shall be according to TS 3.45, except:

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- a) The width of the restoration for composite or concrete pavement shall be measured from the edges of the remaining concrete base or concrete pavement.
 - b) The width of the restoration for asphalt pavement shall be measured from the edges of the remaining bottom course of asphalt.

TS 4.60.10 BASIS OF PAYMENT

TS 4.60.10.01 Restoration – Item

Where the permanent restoration of the utility cut is not included in any items, the payment shall be according to TS 3.45 using the appropriate repair item