

## S-6

# CONCRETE SIDEWALK AND DRIVEWAY APPROACHES

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#### 6.01 SCOPE OF WORK

This specification covers the requirements for the construction of concrete sidewalk, including commercial and residential driveway approaches.

#### 6.02 REFERENCES

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

- S-9 Concrete
- S-4 Granular Base and Aggregates
- AS-204
- AS-222
- AS-401 to AS-404
- AS-506
- OPSS 351 and OPSS.MUNI 351
- OPSS 501
- OPSS.MUNI 1308

## **6.03 MATERIALS**

The Contractor will supply all materials. Materials shall meet the following requirements:

- a) Concrete shall be as per City of Windsor Standard Specification S-9 for Concrete.
- b) Joint filler material shall be according to OPSS 1308

## **6.04 CONSTRUCTION**

Prior to starting the work, documentation shall be submitted, verifying that the Contractor's representative of the placing crew shall be on site and shall have valid Municipal Exterior Flatwork Certification, ACI Flatwork Certification or an approved equivalent.

### **6.04.01 Removal of Existing Materials**

All existing sidewalks and driveway approaches, as indicated, shall be removed, and the Contractor shall dispose of the material at his own discretion.

The Contractor shall indemnify the owner from all damage caused by him to any private or public services at any time during the construction of the sidewalk or drive and for any other damage caused by any neglect on his part of this or any other condition of this contract.

Any private walks that are cut, damaged, or altered in any way shall be repaired in a manner satisfactory to the City Engineer.

The Contractor shall remove the existing sidewalk in small portions only, sufficient to carry on the day's work and so as to interfere with the business of the street as little as possible.

The Contractor may remove larger sections than stated above upon approval of the City Engineer. The Contractor shall provide accessible access to all affected properties adjacent to where the removals have taken place at the end of each working day before leaving the site, to insure safety to the public.

### **6.04.02 Location**

Where the location and elevation of the sidewalk is not indicated specifically on a plan, a location and elevation shall be established in the field as per the applicable City of Windsor AS drawing and approved by the City Engineer. The cross fall on the boulevard from the sidewalk to the curb shall not be less than 2%, and not be more than 8% or as directed by the Engineer. In all cases, positive drainage of the boulevard shall be maintained.

When sidewalks are to be constructed or reconstructed and drive approaches are present, the sidewalk shall be placed through the existing drives or drive approaches. This will ensure that the finish and colour of the sidewalk will be consistent through all drives and drive approaches.

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When sidewalk are constructed or reconstructed in close proximity to existing buildings, steps shall be taken, whenever possible, to construct the sidewalk so as to provide unrestricted wheelchair access. Any sidewalk which can be constructed within the minimum and maximum cross fall specified herein shall be so constructed to provide wheelchair access. All requests for wheelchair access shall be considered by the City Engineer.

Unless the distance between the curb and the front of the sidewalk exceeds 1.2 metres, the sidewalk will be poured integral with the driveway. Transverse deep-cut trowel joints or saw cuts will delineate the driveway from the walk. No longitudinal trowel joints or saw cuts to delineate the sidewalk will be permitted. If the driveway requires contraction joints, the saw cuts will be placed to provide panels of generally equal size. Where possible, the jointing shall generally conform to match the jointing pattern of the existing driveway. Where the distance between the back of curb and sidewalk exceeds 1.2 metres, the Contractor will have the option of placing the sidewalk independently of the remaining driveway section. Both the panel in front of the sidewalk and the panel in back of the sidewalk shall be at least 1.2 metres wide. Consideration will be given to the size of the panels being matched. The condition of the existing drive will be taken into consideration. If the sidewalk is poured independent of the driveways, care will be taken to ensure that the grade is generally an extension of the driveway. The grade of the remaining driveway line will be considered and care taken that the transition is smooth and an acceptable grade is achieved. When placing the sidewalk independent of the driveway, care will be taken to stay consistent with the method used for driveways on the remainder of the block (i.e., integral or independent). When replacing all driveways on a block as part of the restoration of road or sewer work, one method will be used for the entire block.

When the distance between the back of curb and front of sidewalk is less then 600mm, the sidewalk shall extend to the back of the curb with a minimum width of 1.5m.

#### **6.04.03      Excavation**

Excavation shall be to the depth as shown on the plans or as required during the course of the work by the City Engineer, and the disturbed material in the bottom of the excavation shall be thoroughly consolidated to the satisfaction of the City Engineer. Water shall be used as an aid to compaction where required. The base of the excavation shall be compacted and shall be witnessed and documented by the site inspector. Surplus excavated materials, not required for backfilling, shall be disposed of at the Contractor's cost. The work of excavation shall include any clearing and grubbing encountered.

The Contractor shall ensure that during excavation no damage to any existing trees or the root systems of any trees occurs. Should damage occur due to the negligence of the contractor, the City Forester will be notified to assess the damage. The monetary value of the damage shall be borne by the Contractor.

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Additional excavation to remove unsuitable sub grade material shall be at the direction of the City Engineer and shall be paid at the direction of the City Engineer. Any additional Granular 'A' or required engineered fill shall also be paid at the direction of the City Engineer.

**6.04.04 Base**

On the sub-grade, brought to the correct line and elevation, as above described, shall be placed a layer of Granular 'A' Base Course, which shall have a minimum uniform thickness of at least fifty (50) millimetres. The Granular 'A' Base Course shall be compacted according to OPSS 501 and S-4 and shall be witnessed and documented by the site inspector.

The field density determination will be made in accordance with OPSS 501 and S-4. The surface of the base shall have a minimum 2% cross fall towards the road. The subgrade shall be well wetted prior to the placing of the concrete. At no time shall the Contractor place concrete on a frozen granular sub-base.

**6.04.05 Forms**

Forms shall be of wood or metal and of sufficient strength to resist springing, tipping or other displacement due to the placing of concrete and such other loads as may be superimposed during construction. Forms shall be free from warps, splits, holes, and bulges and all bolts, rivets and fittings shall be countersunk. Forms shall be erected without the use of internal ties and shall be sufficiently tight to prevent the leakage of mortar. The faces of forms against which concrete is to be placed shall, before the placing of concrete, be thoroughly cleaned and coated with an approved release agent or other approved material. Forms when tested with a 3-metre straight edge or curved template shall not deviate on the top surface more than 3mm nor on the inside faces more than 6mm from the testing edge of the template.

**6.04.06 Contraction Joints**

Transverse weakened-planed contraction joints shall be constructed at right angles to the sidewalk line.

Contraction joints shall be placed transversely as shown on drawing AS-401 and AS-403. The width of the contraction joint shall be 3 to 5 mm and a minimum depth of 65 mm or at least one fourth of the thickness of the concrete depth.

Contraction joints maybe sawed, hand-formed, or made by 3mm thick division plates in the formwork. Sawing shall be done early after the concrete has set to prevent the formation of uncontrolled cracking. The joints may be hand-formed either by (1) using a narrow or triangular jointing tool or a thin metal blade to impress a place of weakness into the plastic concrete, or (2) inserting 3mm thick steel strips into the plastic concrete temporarily. Steel strips shall be withdrawn before final finishing of the concrete. Where division plates are used to make contraction joints, the plates shall be removed after the concrete has set and

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while the forms are still in place. All longitudinal contraction joints and transverse contraction joints longer than 1.8m in length shall be sawcut.

Deep trowel joints must be constructed in a workman like manner, to the satisfaction of the City Engineer.

**6.04.07 Full Depth Expansion (Isolation) Joints**

Full depth isolation joints shall be used on all driveways, change in sidewalk direction, and where the sidewalk meets the curb at all intersections. Isolation joints will be placed at both the curb and where the new driveway approach abuts an existing hard surface at or toward private property. Existing surfaces will be cut to a true, full depth vertical face so that the jointing material will fit flush to the existing surfaces. Extra full-depth saw cutting and chipping may be required to achieve this. Full-depth isolation joint material will be placed between all buildings, driveways, change in sidewalk direction, and sidewalks. Transverse full-depth isolation joints will be required from time to time to intercept or change contraction joint patterns, at areas of expected differential movement, or where directed by the City Engineer.

Isolation joints shall be formed with 12mm thick full-depth joint filler material meeting the requirements of OPSS 1308, except that cork expansion fillers will not be accepted. Preformed sponge rubber expansion joint material shall be 12mm thick and may only be used in conjunction with the areas outlined in Section 6.04.09. In all other areas, non-extruding and resilient bituminous type expansion joint is to be used, unless approved by the City Engineer.

Panels of expansion joint shall be pre-cut from a single piece to the shape of the cross-section as shown on the standard drawings, but so as to provide a 5 mm recess on the exposed surfaces. Cutting and tolerances shall conform to OPSS 1308.

Transverse expansion joints shall have a maximum spacing of 18 metres. In addition to the foregoing, expansion joints shall be constructed wherever shown on the standard plans.

**6.04.08 Construction Joints**

A 5-mm bituminous fibre joint filler shall be placed at the point of interruption before recommencing the placement of concrete sidewalks or driveways.

**6.04.09 Appurtenances in the Sidewalk and Driveways**

The Contractor must carefully fit the sidewalk and/ or driveways around all permanent openings and must take special care to prevent damage to any utility, which may be in or under the sidewalk and/ or driveways. The Contractor shall remove iron gratings, covers, etc., for areaways, etc., and shall replace them in position in a neat and competent manner.

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Any and all appurtenances to the sidewalk and/ or driveways shall be designed and constructed in such a manner so as not to negatively affect the longevity, performance, and safe use of the sidewalk and/ or driveways. Poles, hydrants, structures, and driveways shall be isolated with full-depth isolation joint material. Manholes, junction boxes, water valves, cleanouts etc. shall be set to exactly match the finished grade of the sidewalk and/ or driveways

Raised planters and landscaped curbs shall be a minimum of 150mm high and shall be permitted only in areas where a minimum 1.5m clear walkway can be maintained.

Any and all appurtenances shall not adversely affect the drainage pattern of the sidewalk/boulevard areas. The installation of catchbasins shall be considered an option when the placement of a sidewalk and/ or driveways adversely affect the drainage pattern by restricting or altering any drainage areas.

A minimum clearance of 300mm from the closest edge of the sidewalk and/ or driveways, shall be provided for street lighting/hydro poles, fire hydrants and other vertical obstructions.

Street furniture installation on a sidewalk shall be as per City of Windsor Street Opening permit requirements or as approved by the City Engineer.

#### **6.04.10 Concrete Placement**

Concrete placement shall be according to City of Windsor Standard Specification S-9 and the following requirements:

Concrete shall not be placed until the foundation and the forms have been inspected and approved by the City Engineer.

Concrete is to be placed at or near its permanent location and consolidated such that segregation of the aggregate does not occur. The concrete shall be placed and consolidated against all formwork; all entrapped air shall be eliminated.

Concrete shall be placed continuously. Contact with partially set concrete shall be avoided. When placement of concrete is interrupted, it shall be at a vertical form. 5 mm bituminous fibre joint filler shall be placed at the point of interruption before recommencing placement of concrete.

The concrete shall be placed true to the lines and grades specified in the Contract Documents.

The restriction of concrete placement shall be as per City of Windsor Standard Specification S-9 – General Concrete Specification

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**6.04.11 Finishing**

The surface of concrete sidewalks and driveways shall be given a broomed finish, after finishing with a magnesium or aluminum float, unless otherwise specified by the City Engineer. The protection of concrete structures until their acceptance onto maintenance by the Corporation shall be the sole responsibility of the Contractor. The presence of footprints or other markings on the completed sidewalk/driveway shall require saw cutting, removal, and replacement of the complete section at the Contractor's expense. Exterior paths of travel shall only be given a broom finish and never a "stamped" concrete finish. When a "stamped" concrete finish has been specified for a drive approach or a specific accent area not intended for pedestrian traffic, it shall be imperative that water does not pond due to improper application and finishing procedures with the specified patterns. Areas adversely affected by the application of stamping moulds shall be removed and replaced at the Contractors expense.

Unless otherwise provided, back edges shall be rounded by use of a 6mm radius-edging tool. While it is not necessary to remove the edger mark, the method will be consistent for the entire contract. Care shall be taken to ensure that the plastic concrete is firm enough to prevent ridges from forming from the concrete slurry while finishing the edging.

In no cases shall sidewalks pond water or exceed the specified grade to be accepted. All areas which pond water or have insufficient/excessive cross fall, including those caused by poor construction and finishing methods, shall be removed and replaced at the Contractor's expense.

**6.04.12 Curing and Protection**

The curing and protection of the completed sidewalk and driveway shall conform to the requirements contained in the Standard Specification for Concrete (S-9).

**6.04.13 Backfilling and Shouldering**

As soon as the City Engineer will permit, the Contractor shall backfill at each edge of the walk and shall place earth shouldering at the edges of the sidewalk with an approved backfill material to grades approved by the City Engineer. If the forms are stripped from the concrete, but not immediately backfilled behind the removal operation, the Contractor shall cure or protect all exposed areas where the forms were removed, as outlined in Standard Specification for Concrete (S-9), unless otherwise directed by the City Engineer.

**6.05 PROTECTION OF THE SIDEWALK AND DRIVEWAY FROM TRAFFIC**

The Contractor shall by barricades, guards, or by other means, protect all sidewalk surfaces from harm by traffic until the City Engineer authorizes the sidewalk to be opened to public

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use. This period shall, for pedestrian traffic, not exceed 72 hours and for the opening of lane or driveway crossing, not exceed 7 days.

The Contractor shall at all times, prior to the opening to traffic, provide suitable bridging as other means of access to adjacent properties, but will only be required to do so at existing traffic points.

The Contractor shall be held responsible for any damage or defacing done to the finished work by other parties until the finished work is accepted by the City Engineer and shall repair or replace any damaged or defaced portion of the work as required by the City Engineer.

## **6.06 DAMAGE TO ADJACENT BOULEVARDS AND PAVEMENTS**

The Contractor will be required to make good, as directed, all damage done to the roadway or pavements while the work is in progress.

The Contractor will be required to remove all rubbish and material from the boulevards adjoining the sidewalk and restore the same to as good and clean condition as they were before commencing the work. Should the Contractor choose to use plastic as their method of protection, when removed from the concrete, all plastic is to be removed and disposed of at the Contractor's expense. If any of the sod beyond the area of construction is destroyed by the Contractor or his employees, he will be required to replace it, at his expense, with new sod to the approval of the City Engineer.

## **6.07 QUALITY ASSURANCE**

The quality assurance for all concrete poured for sidewalks and driveways shall conform to the requirements contained in the Standard Specification for Concrete (S-9).

The Contractor shall be responsible for the line and grade of the forms as provided by the City Engineer or will be responsible to match existing conditions when required.

Prior to any concrete being poured, the forms and granular base shall be inspected by the City Engineer. The Contractor shall notify the City Engineer a minimum 24 hours before the concrete pour is to take place to allow sufficient time to review the granular base and forms.

The Contractor shall be responsible for the concrete work during the curing time and when the forms are removed until the work is accepted by the City Engineer.

Positive drainage shall be constructed and maintained in all finished work areas including sidewalks, adjacent driveway & boulevard, and wheelchair ramps.



## **6.08 MEASUREMENT FOR PAYMENT**

### **6.08.01 Sidewalk**

Measurement will be made in square metres of the total area of sidewalk installed.

### **6.08.02 Driveway Approaches**

Measurement will be made in square metres of the total area of driveway approaches installed.

### **6.08.03 Granular Base Course**

This item shall be included in the unit price submitted for the placement of the new concrete unless otherwise stated in the tender documents.

### **6.08.04 Water**

No measurement for payment required for this item.

### **6.08.05 Removal of Old Sidewalk and Driveway Approaches**

Measurement will be made in square metres of the total area removed as directed by the City Engineer.

## **6.09 BASIS OF PAYMENT**

### **6.09.01 Sidewalk and Driveway Approaches**

The Contract prices for the various components making up the sidewalk or the driveway approaches will be full compensation for supplying all labour and equipment and completely installing in accordance with this specification, the sidewalk or driveway approach as called for in the plans and for supplying all material.

Excavation required to set the various components to the required line and grade will be considered as part of the work of installing the sidewalk or driveway approach; however, should such excavation overlap excavation required for any other work under the contract, then payment shall be made in accordance with the specification for such other work as though no excavation were required for sidewalk or driveway approach construction.

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**6.09.02 Granular Base Course**

This item shall be included in the unit price submitted for the placement of the new concrete unless otherwise stated in the tender documents.

**6.09.03 Water**

This item shall be included in the unit price submitted for the placement of the new concrete.

**6.09.04 Removal of Old Sidewalk and Driveway Approaches**

Payment will be made at the contract unit price per square metre for the measured quantities.