

**Construction Specification for
the Repair of Concrete Pavement and Base**

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TS 3.45.01 SCOPE

This specification covers the requirements for the repair of concrete pavement and base.

TS 3.45.02 REFERENCES

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

City of Toronto Standard Specifications

TS 3.40 Construction Specification for Concrete Road Base
TS 1350 Amendment to OPSS.MUNI 1350 – Material Specification for Concrete –
Material and Production

City of Toronto Standard Drawing

T-508.010-1 Anchored Hook Bolt Dowel and Concrete Repair Detail

Ontario Provincial Standard Specifications

OPSS 180 General Specification for the Management of Excess Materials
OPSS 364 Construction Specification for Partial Depth Repairs in Concrete Pavement
OPSS 1212 Material Specification for Hot-Poured Rubberized Asphalt Joint Sealing
Compound

TS 3.45.03 DEFINITIONS – Not Used

TS 3.45.04 DESIGN AND SUBMISSION REQUIREMENTS

Submission and design requirements shall be according to TS 1350, except that sections on reinforcing and pre-stressing steel do not apply.

TS 3.45.05 MATERIALS

TS 3.45.05.01 General

Materials shall be according to TS 3.40, except that sections on tie bars and load transfer devices, expansion joint material and adjustment bricks do not apply.

TS 3.45.05.02 Hook Bolt Dowels

Hook bolt dowels shall according to T-508.010-1.

TS 3.45.05.03 Joint Sealant

Joint sealant shall be hot-poured rubberized asphalt cement meeting the requirements of OPSS 1212.

TS 3.45.06 EQUIPMENT

Equipment shall be according to TS 3.40, except that slipform equipment shall not apply.

TS 3.45.07 CONSTRUCTION

TS 3.45.07.01 Partial Depth Repair

Partial depth repair of concrete base and pavement shall be according to OPSS 364.

TS 3.45.07.02 Concrete Removal

All areas of concrete removal shall be as shown on the Contract Drawings.

The outer limit of the concrete removal shall be sawcut to the full depth of the existing concrete. The concrete removal method shall ensure that the concrete to be removed is not broken in place and that the adjoining concrete and underlying base remain undisturbed. Where the existing granular base is disturbed, the loosened material shall be removed, the surface compacted and replaced with an additional depth of concrete, at no extra cost to the City.

The section of concrete to be removed along an outer edge of pavement or base shall be a minimum of one metre wide and a minimum of one metre long. An interior section of concrete to be removed shall be a minimum of 600 mm in each direction. Concrete removal shall be configured so as not to leave small areas and excessive joints in close proximity in the final pavement.

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

TS 3.45.07.03 Joints

The outer edges of the repair, except for those abutting curb or gutter shall be considered dowelled contraction joints. Any edge formed by staging shall be considered as an undowelled contraction joint. All joints shall be constructed according to TS 3.40 and sealed with an approved joint sealant. Joints shall be formed in the repair section to match any and all joints in the existing concrete pavement or base.

TS 3.45.07.04 Dowel Bars

Dowel bars shall be installed along the face of the repair abutting the existing concrete road base or pavement. Joints formed due to staging shall be constructed with a keyed joint.

Dowel bars shall be installed at depth equal to half the thickness of the existing concrete and spaced at 300 mm centre to centre for transverse joints.

TS 3.45.07.05 Hook Bolt Dowels

Hook bolt dowels shall be installed along the face of the repair abutting the existing concrete road base or pavement. Joints formed due to staging shall be constructed with a keyed joint.

Hook bolt dowels shall be installed at a depth equal to half the thickness of the existing concrete and spaced at 600 mm centre to centre for longitudinal joints.

TS 3.45.07.06 Concrete Placement

Concrete placement for full depth repair of concrete road base or pavement shall be according to TS 3.40.

The surface of the concrete repair shall be flush with the existing concrete road base or pavement.

TS 3.45.07.07 Concrete Finishing

Concrete finishing for full depth repair of concrete road base or pavement shall be according to TS 3.40.

TS 3.45.07.08 Surface Texturing

Concrete pavement shall be textured to match the existing surface, or shall be broom finished according to TS 3.40.

TS 3.45.07.09 Concrete Curing

Concrete curing for full depth repair of concrete road base or pavement shall be according to TS 1350.

TS 3.45.07.09.01 *Curing with Burlap and Water*

Burlap mats shall be pre-soaked by immersion in water for at least 6 hours immediately prior to placing. The mats shall cover the entire width and edges of the exposed concrete. The mats shall overlap 300 mm and shall be held down to prevent displacement. The mats shall be maintained in place and kept saturated for a minimum period of 7 Days. The Contractor may constantly water the mats or cover them with opaque polyethylene film, or a combination of both, in order to keep the mats saturated.

Alternatively, this method shall be used for a minimum period of 3 Days following which the surface shall be cured with curing compound according to TS 1350.

TS 3.45.07.09.02 *Curing with Geotextile Fabric and Water*

Geotextile fabric shall be pre-soaked by immersion in water for at least 6 hours immediately prior to placing. Two layers of fabric shall be applied to the surface of the concrete and shall cover the entire width and edges of the exposed concrete. Strips shall overlap 100 mm and shall be held down to prevent displacement. The fabric shall be maintained in place and kept saturated for a minimum period of 7 days. The Contractor may constantly water the mats or cover them with opaque polyethylene film, or a combination of both, in order to keep the mats saturated.

Alternatively, this method shall be used for a minimum period of 3 Days following which the surface shall be cured with curing compound according to TS 1350.

TS 3.45.07.09.03 *Curing with Polyethylene Film*

White, opaque polyethylene film (100 µm thick) shall be placed such that air flow between it and the concrete surface is prevented. The film shall be held down at the edges and laps, and shall be overlapped a minimum of 150 mm, to prevent displacement. The film shall be kept in place for a minimum period of 7 Days.

Alternatively, this method shall be used for a minimum period of 3 Days following which the surface shall be cured with curing compound according to TS 1350.

TS 3.45.07.09.04 *Curing with Membrane Compound*

Immediately prior to application, the curing compound shall be agitated by mechanical means to provide a homogeneous mixture. Curing compound shall be spray applied in two coats to the concrete surface, with the second coat applied at right angle to the first coat, such that the membrane formed is uniform in thickness and colour and is free of breaks and pinholes. The surface shall be maintained in this condition for a minimum period of 7 Days. The rate of application shall not be less than that specified by the manufacturer of the compound.

TS 3.45.07.10 *Concrete Protection*

Concrete protection for full depth repair of concrete road base or pavement shall be according to TS 3.40 and TS 1350.

TS 3.45.08 *QUALITY ASSURANCE*

Quality assurance shall be according to TS 3.40 and TS 1350, except that the requirements for concrete thickness shall not apply for partial depth repairs.

If the tests on the concrete cylinders show that the concrete does not meet the requirements of this specification, the area represented by the tests shall be removed and replaced at the Contractor's expense.

TS 3.45.09 *MEASUREMENT FOR PAYMENT*

**TS 3.45.09.01 *Concrete Road Base Repair
Concrete Pavement Repair***

Measurement of concrete repairs shall be by the surface area in square metres (m²).

TS 3.45.10 *BASIS OF PAYMENT*

**TS 3.45.10.01 *Concrete Road Base Repair – Item
Concrete Pavement Repair – Item***

Payment at the Contract Price for the above tender item(s) shall be full compensation for all labour, Equipment and Material to do the work. Payment shall include the sawcutting, removal, disposal of asphalt, concrete and aggregates, the supply and installation of hook bolt dowels and round dowel bars, the supplying, placing, curing and protection of concrete and the sealing of all joints.