

**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 specifications and publications:

Ontario Provincial Standards

OPSS 180 – Management and Disposal of Excess Material

OPSS 364 – Partial Depth Repairs in Concrete Pavement

OPSS 1212 – Hot-Poured Rubberized Asphalt Joint Sealing Compound

City of Toronto Standard Specifications

TS 3.40 – Construction Specification for Concrete Road Base

TS 1350 – Amendments to OPSS 1350 – Material Specification for Concrete – Material and Production

TS 3.45.03 DEFINITIONS – Not Used

TS 3.45.04 SUBMISSION AND DESIGN REQUIREMENTS

Submission and design requirements shall be as specified in TS 1350, except that sections on reinforcing and prestressing steel do not apply.

TS 3.45.05 MATERIALS

TS 3.45.05.01 General

Materials shall be as specified in 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 be as specified in TS 3.40.

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 as specified in 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 as specified in OPSS 364.

TS 3.45.07.02 Staged Repair

Where the operation requires a staged repair, additional hooked dowels shall be installed to connect the repair stages, as required.

TS 3.45.07.03 Concrete Removal

All areas of concrete removal shall be as shown on the contract drawings or as directed by the City.

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 the Contractor's expense.

The section of concrete to be removed along an outer edge of pavement or base shall be a minimum of 1m wide and a minimum of 1m 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 excess material shall conform to OPSS 180.

TS 3.45.07.04 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 as specified in 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 3.45.07.05 Hook Bolt Dowels

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

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 and 300 mm centre to centre for transverse joints.

TS 3.45.07.06 Concrete Placement

Concrete placement for full depth repair of concrete road base or pavement shall conform 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 conform 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 as specified in TS 3.40.

TS 3.45.07.09 Concrete Curing

Concrete curing for full depth repair of concrete road base or pavement shall conform 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 as specified in 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 as specified in 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 as specified in 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 conform to TS 3.40 and TS 1350.

TS 3.45.08 QUALITY ASSURANCE

Quality assurance shall conform 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 for the above item(s) shall be by the surface area in square metres (m²) of the concrete repair.

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 item(s) shall be full compensation for all labour, equipment, materials and incidentals to do the work. Payment shall include, but not be limited to, the sawcutting, removal, disposal of asphalt, concrete and aggregates, the supply and installation of hook bolt dowels, the supplying, placing, curing and protection of concrete and the sealing of all joints.