DRAFT B366 - REPAIRING CONCRETE PAVEMENT AND CONCRETE BASE - OPSS 366

366.1 GENERAL

366.1.1 Introduction

OPSS 366 covers the requirements for full depth and partial depth repair of concrete pavement and concrete base using conventional concrete, high early strength concrete, and fast-track concrete (full depth repairs only).

Full depth concrete pavement or concrete base repairs are typically recommended for severe distresses associated with slab cracking (transverse or longitudinal), joint spalling where spalling extends 75 mm or 1/3 of the thickness of the slab below the surface of the slab, D-cracking corner breaks, and joint faulting.

Partial depth repairs in concrete pavement are recommended where surface defects, such as spalling and scaling, are limited to a maximum depth of 1/3 the thickness of the existing concrete pavement or concrete base.

366.1.2 Definitions

Conventional Concrete Repair

Conventional concrete repair means a concrete pavement or concrete base repair process excluding high early strength concrete repair or fast-track concrete repair.

Conventional concrete repair can be used for full depth or partial depth repairs.

High Early Strength Concrete Repair

High early strength concrete repair means a process in which a section of concrete pavement or concrete base is closed to traffic, concrete is removed, and concrete repairs are completed, and the section re-opened to traffic within 72 hours or within the timeframe specified.

High early strength concrete repair can be used for full depth or partial depth repairs.

Fast-Track Concrete Repair

Fast-track concrete repair means a process in which a section of concrete pavement or concrete base is closed to traffic, concrete is removed, concrete repairs are completed, and the section re-opened to traffic within a specified time period of 24 hours or less.

When the lane closure period does not allow the use of conventional or high early strength concrete repairs, fast-track concrete repair may be used as determined by the Regional Geotechnical Section.

Fast-track concrete repair can be used for full depth repair and shall not be used for partial depth repairs.

366.2 REFERENCES

- CDED B510-5, Removal - Pavement Work
- Pavement Design Report

366.3 TENDER ITEMS

Item Code	Title	Col Type	U.O.M.	PQP
0366-0020	Fast-Track Concrete Repair	Variation	m²	N
0366-0030	Conventional Concrete Repair (Full Depth)	Variation	m²	N
0366-0035	Conventional Concrete Repair (Partial Depth)	Variation	m²	N
0366-0040	High Early Strength Concrete Repair (Full Depth)	Variation	m²	N
0366-0045	High Early Strength Concrete Repair (Partial Depth)	Variation	m²	N

366.4 SPECIFICATIONS

The requirements for repairing concrete pavement and concrete base are specified in OPSS 366.

The requirements for the sawcutting, cleaning and sealing of joints are specified in OPSS 369, Construction Specification for Sealing or Resealing of Joints and Cracks in Concrete Pavement and Concrete Base.

366.5 SPECIAL PROVISIONS

Special Provision No. 103S57

366.6 STANDARD DRAWINGS

The designer must base their work on highway engineering standards pertaining to the above tender items. Repairing concrete pavement and concrete base and other pavement design related standards are contained in the 500 series Ontario Provincial Standards Drawings (OPSD) and Ministry of Transportation Ontario Drawings (MTOD). Cross section elements are illustrated in the 200 series of the Standard Drawings.

366.7 DESIGN

366.7.1 General

Investigation of the existing concrete pavement and concrete base structure including the existing concrete type (i.e., Joint Plain Concrete Pavement (JPCP) and/or Joint Reinforced Concrete Pavement (JRCP)), pavement joint detail, layer thicknesses and type of underlying materials should be carried out prior to the design.

When conducting concrete base repairs, the removal of the surface covering the concrete base should be as directed in the Pavement Design Report. See CDED B510-5 for more information. Repair materials are limited to those identified in the Materials section of OPSS 366.

Existing shoulders are to be repaired and restored with similar shoulder material.

In general, unless otherwise noted in the Pavement Design Report, full depth concrete repairs shall be carried out for a full lane width and a minimum length of 2 m and partial depth concrete repairs may be less than a full lane wide. Details of the repair area and depth are documented in the Pavement Design Report.

Consideration for combining repair areas should be given, where the frequency and spacing of repair areas may impact the performance. When the defects intersect any joints that have dowel bars or tie bars, partial depth repair should not be used. If in doubt, designers are recommended to revert to full depth repair.

366.7.2 Fast-Track Concrete Repairs

Fast-track concrete repairs require specially designed concrete mixes. Consideration should be given to specifying a trial repair area that can be easily accessed and monitored to verify the performance of the concrete mix and the contractor's operation. The selected trial repair area shall be a minimum of 2 m long by 3.75 m wide and 0.25 m deep.

The specification does not permit fast-track concrete repair for partial depth concrete repairs.

366.7.3 Re-Texturing of Pavement Surface

The Regional Geotechnical Section shall be consulted to determine whether diamond grinding and grooving are needed.

366.7.2 Source of Information

The Regional Geotechnical Section and the Pavement Design Report are the main sources of information for the above tender items. The Regional Geotechnical Section shall provide recommendations on the type of repair, size of the repair area(s), depth of repair and type of concrete to be used.

The types and thicknesses of existing concrete pavement, concrete base and underlying materials are established and confirmed by the Regional Geotechnical Section.

The Pavement Design Report shall be used to estimate quantities, lengths, widths, depths, etc., for bidding purposes, with adjustments made in the field as required.

366.8 COMPUTATION

These are measured items.

The unit of measurement for these items is square metre. Quantities are based on the length by width surface areas of the repairs.

366.9 DOCUMENTATION

366.9.1 General

Depending on the type of concrete repair, the duration of repairs and the associated concrete curing time should be considered when estimating the number of repairs and crew size needed for the work time estimate. For concrete base repairs, staging, removal of the surface covering the concrete base, visual inspection and falling weight deflectometer (FWD) testing should also be considered when estimating the work duration.

The contract documents must specify the permitted lane closure times to carry out the construction. Consideration should be given to traffic staging and shown in the contract documents if considered.

366.9.2 Contract Drawings

The designer shall prepare a plan view drawing to detail the location of the repair areas for review and approval by the Regional Geotechnical Section.

The location of each repair area is indicated on the contract drawings by station and offset.

Existing pavement structure details, including the types and thickness of existing concrete pavement or base (i.e., JPCP and/or JRCP) and underlying materials, are to be shown on the Contract Drawings.

Theoretical tie bar and dowel bar locations and requirements are shown on the Standard Drawings. Typically, the tie bars are required at longitudinal joints except where the new concrete abuts existing concrete. Tie bars are required at longitudinal joint for a long stretch of repair area (more than five concurrent slabs) where the new concrete abuts existing concrete. The requirements for tie bars should then be included in the contract drawing.

Typically, the existing transverse expansion joints are removed and replaced. In the case where the transverse expansion joints are not to be replaced, it should be noted in the Contract Drawing.

366.9.3 Quantity Sheets

The locations and quantities are documented on a “Quantities - Miscellaneous 1” sheet.

The locations are identified by entering the station-to-station limits in the Location and Position column.

Conventional Concrete Repair (Full Depth), Conventional Concrete Repair (Partial Depth), High Early Strength Concrete Repair (Full Depth), High Early Strength Concrete Repair (Partial Depth) and Fast-Track Concrete Repair are variation items. Each variation is entered in a separate column and heading on the quantity sheet. Individual quantities are entered in the appropriate column.

The variation parameter is: Approximate Depth (mm), Actual Depth Will Vary

A column note: “For bidding purpose only, actual depth to be field verified.” shall be added for the above items in the Quantity Sheet.

366.9.4 Documentation Accuracy

Stations are recorded to the nearest whole metre.

Individual quantities are recorded to an accuracy 0.1 m².

The item total is rounded to the nearest whole number and transferred to the Tender Item List.

366.9.5 Non-Standard Special Provision (NSSP)

If the Regional Geotechnical Section determines that the diamond grinding and grooving are required, a NSSP shall be prepared.