Administration and Inspection Activities for Repairing ~~Rigid~~Concrete Pavement and Concrete Base with Precast Concrete Slabs

(As Specified in OPSS 363)

363.01 SCOPE

This CAIS covers the construction administration and inspection requirements for ~~Repairing Rigid Pavement~~repairing concrete pavement and concrete base with ~~Precast Concrete Slabs~~precast concrete slabs as specified in OPSS 363, November ~~2014~~2025.

363.02 REFERENCES

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

Ontario Provincial Standard Specifications, Construction:

OPSS 363 Repairing ~~Rigid~~Concrete Pavement and Concrete Base with Precast Concrete Slabs

Ontario Provincial Standard Specifications, Material:

OPSS 1350 Concrete – Materials and Production
OPSS 1355 Precast Concrete – Materials and Production

Construction Administration and Inspection Specifications (CAIS):

CAIS ~~350~~ 366 Repairing Concrete Pavement and Concrete Base
~~CAIS 360 Full Depth Repair of Concrete Pavement or Base~~
CAIS 369 Sealing or Resealing of Joints and Cracks in Concrete Pavement and Concrete Base
CAIS 510 Removal
~~CAIS 904 Concrete Structures~~
~~CAIS 905 Steel Reinforcement for Concrete~~
CAIS 929 Abrasive Blast Cleaning - Concrete Construction
CAIS ~~1002 Aggregates -~~1355 Precast Concrete
~~CAIS 1302 Water~~
~~CAIS 1350 Concrete -~~ – Materials and Production
~~CAIS 1440 Steel Reinforcement for Concrete~~
~~CAIS 1441 Load Transfer Assemblies~~

~~**Ontario Ministry of Transportation Publications:**~~

MTO ~~Materials Engineering and Research~~**Forms:**

PH-CC-322 Concrete Construction Report~~:~~
~~MERO-053 Falling Weight Deflectometer (FWD)~~PH-CC-885 Concrete Referee Testing ~~Guideline~~Request

363.03 DEFINITIONS

For the ~~purpose~~purposes of this CAIS, the definitions shall be as specified in OPSS 363.

363.04 DESIGN AND SUBMISSION REQUIREMENTS

363.04.01 ~~Submission~~Design Requirements

~~**363.04.01.01 Precast Concrete Pavement Slab Repair Plan**~~

Administrative Activities:

1	-	Check that the design of the precast concrete ~~pavement slab repair operation plan~~slabs and other materials is ~~received within a~~as specified ~~timeline and prior to the start of the work~~in OPSS 363.	-
~~2~~	~~-~~	~~Review the details and check for compliance as specified.~~	~~-~~

363.04.~~01.~~02 Submission Requirements

363.04.02.01 Precast Concrete ~~Mix Design~~Slab Repair Plan

Administrative Activities:

1	-	Check ~~that~~ the precast concrete ~~mix design~~slab repair plan is received ~~within a~~as specified ~~timeline and~~ prior to the start of the trial or start of the work if the trial is not required.	-
2	-	Review the ~~mix design~~details and ~~check~~Check for compliance as specified.	-

363.04.~~01.03~~02.02 Flowable Fill Mix Design - Michigan Method

Administrative Activities:

1	-	When flowable fill is used as a levelling material, ~~check~~Check that flowable fill mix design ~~and trial batch documentation are~~is received ~~within a~~as specified ~~timeline and~~ prior ~~to~~ the trial or start of work~~/placement~~ if the trial is not required.	-
2	-	Review the mix design and ~~trial batch document and check~~Check for compliance as specified.	-

363.04.~~01.04~~02.03 Proprietary ~~Concrete Repair Material (PCRM)~~Patching

Materials - Product Details

Administrative Activities:

1	-	Check that the product details ofand information for proprietary concrete repairpatching material (PCRM) isPPM) are received within aas specified timeline and prior to the commencementtrial or start of work if a trial is not required.	-
2	-	Review the product details and checkinformation and Check for compliance and acceptance as specified.	-

~~363.04.01.05 Chipping Hammer~~
363.04.02.04 Bedding Grout Mix Design – Fort Miller Super-Slab® Method

Administrative Activities:

1	-	When bedding grout is used, Check that chipping hammer manufacturer's published specifications arethe bedding grout mix design is received within aas specified timeline and prior to the commencementtrial or start of the work if the trial is not required.	-
2	-	Review the specificationsmix design and checkCheck for compliance and acceptance as specified.	-

363.04.02.05 Chipping Hammaer

Administrative Activities:

1	-	Receive and Review the specifications for the chipping hammer, and Check that it is as specified in the Equipment section of OPSS 363.	-

363.04.02.06 Test Results for the Trial Precast Concrete Slab Repair

Administrative Activities:

1	-	Receive and Review the test results for the trial precast concrete slab repair, and Check that the results are as specified in OPSS 363.	-

363.05 MATERIALS

Administrative Activities:

1	-	Check that materials are as specified in OPSS 363.	-

~~1~~2	--	~~Review and check~~Check that ~~materials to be used meets the materials requirements. Additional~~ precast concrete slabs are as specified in OPSS 1355 in its entirety. For precast concrete slabs, additional inspection and administrative ~~and inspection~~ activities shall be ~~according to the CAIS specified below:~~ ~~• Concrete General as specified in CAIS 350 and CAIS 1350.~~ ~~• Concrete Aggregate~~ as specified in CAIS ~~1002.~~ ~~• Tie Bars as specified in CAIS 1440.~~ ~~• Dowel Bars as specified in CAIS 1441.~~ ~~• Joint Materials as specified in CAIS 369.~~ ~~• Water as specified in CAIS 1302~~1355.	--

363.06 EQUIPMENT

Inspection Activities:

1	M	~~Check that equipment to be used meets the equipment requirements. For hand finishing equipment and straight edges, administered and inspected according to CAIS 904.~~Check that equipment is as specified in OPSS 363.	25%

363.07 CONSTRUCTION

363.07.01 General

Inspection Activities:

1	M	Check that construction is as specified in OPSS 363 and the Contract Documents.	100%

363.07.~~01.03 Trial Slab Repair~~02 Trials

Inspection Activities:

1	-	Check that the trial slab repair is conducted ~~on~~for both the intermittent slab and continuous slab, if applicable.	100%
2	M	Based on a visual assessment of the trial, ~~check~~Check that ~~if~~ the ~~contractor~~Contractor has demonstrated the ability to conduct the slab repair. If acceptable, ~~notify~~Notify the ~~contractor~~Contractor to proceed with the slab repair work. If rejectable, ~~notify~~Notify the ~~contractor~~Contractor that additional trial slab shall be performed until the slab repair meets the requirement.	100%
3	M	Check unacceptable trial repair slabs are repaired, removed, or reinstated as required.	100%

Administrative Activities:

1	-	Check that the strength gain charts for PPM are developed.	-
~~1~~2	M	Check that a notice from the Contractor specifying the location of trial slab repair is received as specified and the location is within the contract limits.	-
~~2~~3	M	In lieu of a trial slab repair, ~~CA~~the Contract Administrator may allow the ~~contractor submits evidence~~Contractor to submit information demonstrating the ability to successfully conduct the slab repair using the same equipment, placing ~~crew~~personnel, and methodology to meet the ~~Contract~~contract requirements ~~for conducting the slab repair on any~~from another MTO Contract within the ~~limits~~ specified time limit. Check and ~~review~~Review the ~~evidence~~information submitted and ~~notify~~Notify the Contractor ~~for~~of acceptance/rejection.	-

363.07.~~02~~03 Operational Constraints

Inspection Activities:

1	-	Check that perimeter saw cutting of the removal area is not carried out more than a specified day in advance of the expected repair date.	25%
2	-	Check that bedding grout and dowel grout are carried out as soon as possible after the installation of precast concrete pavement slab.	50%
3	-	Check that the flowable fill mix temperature and predicted ambient air temperature meet the specified requirement.	50%
4	-	Prior to the placement of ~~PCRM, check~~PPM, Check that the Contractor demonstrates that the existing concrete temperature and the ambient air temperature meets the manufacturer's recommendation and requirement for ~~PCRM~~PPM placement.	50%
5	-	Check that construction vehicles, equipment, or traffic is not permitted onto the repair sections until ~~PCRM~~PPM has achieved the required strength.	100%
6	-	Check if the precast concrete slab repair is progressing at a rate that will permit the full restoration of traffic within the allowable time period.	50%

Administrative Activities:

1	-	Receive notification from the Contractor of the intent to repair concrete pavement or concrete base 7 Days prior to commencement of repairs.	-
~~1~~2	-	When the precast concrete slab replacement work rate does not allow for traffic restoration, communicate to the contractor that temporary measures need to be used to fully restore traffic in the timeline.	-
~~2~~3	-	Review the ~~contractors~~Contractor's proposed measures and ~~notify~~Notify the ~~contractor if~~Contractor whether the plan is acceptable or unacceptable.	-

363.07.~~03~~04 Removals

Inspection Activities:

1	M	Delineate the repair areas.	100%
~~1~~2	-	Check that a template is used to delineate the area of removal within the specified accuracy.	100%
~~2~~3	-	Check that outer limit of the removal area is clean and sawcut to full depth, and that cuts do not exceed the overcut requirement.	100%
~~3~~4	-	Check that overcuts are filled with ~~a proprietary material~~an epoxy resin acceptable to the ~~owner~~Owner.	50%
~~4~~5	M	Check that concrete removal is by ~~lifted~~lift-out method without damaging adjacent concrete or asphalt pavement or ~~asphalt shoulder~~shoulders or disturbing the underlying base.	100%
~~5~~6	-	When the adjacent concrete/asphalt is damaged due to the removal procedure, ~~repair~~Check that repairs are as specified ~~is required~~. Repairs ~~to adjacent concrete~~ shall be administered according to applicable components of CAIS ~~360~~366. Review the proposed repair procedure for damaged adjacent asphalt, ~~notify~~Notify the ~~contractor for~~Contractor of acceptance or rejection.	100%

Administrative Activities:

1	-	Concrete removal shall be administered and inspected according to applicable components of CAIS 510.	-

363.07.~~04~~05 Base Preparation

Inspection Activities:

1	M	Check that base preparation for the chosen method meets the base preparation requirements.	100%

~~363.07.05 Steel Reinforcement~~

~~Inspections Activities:~~

~~1~~	~~-~~	~~Steel reinforcement shall be administered and inspected according to applicable components of CAIS 905.~~	~~50%~~

~~363.07.~~06 ~~Dowel Bar~~Precast Concrete Slab Installation ~~–~~ Michigan Method

Inspection Activities:

1	M	Check that dowel bar slots are cut with gang saws as specified and not cause damage to the existing pavement.	100%
2	M	Check that slurry is removed from the slots and pavement after sawcutting, and that slots are not overcut.	100%
3	-	Check that the chipping hammer are used to remove concrete in dowel bar slots is consistent with that of the submitted work plan.	25%
4	M	Check that the concrete is removed to the bottom of the slot is level without damaging existing/adjacent concrete. ~~When the adjacent concrete is damaged, a breakthrough or if a crack develops within a slot due to the removal procedure, Repairs~~If damage occurs, Check that repairs shall be as specified. ~~Administered~~Administration and ~~inspected for~~inspecting of the ~~repair works~~repairs shall be according to ~~applicable components of~~ CAIS ~~360~~366.	100%
5	-	Check that all concrete surface within the slot ~~is~~are abrasive blast cleaned as specified. Abrasive blast cleaning shall be administered according to applicable components of CAIS 929.	100%
6	-	Check that the precast concrete slab installation is as specified, and the surface tolerances are within the specified tolerance.	100%
~~6~~7	M	Prior to placing ~~PCRM, check~~PPM, Check that all concrete surfaces within the slot meet the ~~PCRM's~~PPM's manufacturer requirements. Check that any standing water, dust and loose materials in the slots is removed with compressed air.	100%
~~7~~8	-	Check that ~~PCRM~~PPM mixing and application is as specified.	100%
~~8~~9	-	Check that ~~PCRM~~PPM consolidation, finishing, and curing is as specified.	100%

363.07.07 Precast Concrete Slab Installation – Fort Miller Super-Slab® Method

363.07.07.01 Dowel Bar and Tie Bar Installation ~~- Fort Miller Super Slab Method~~

Inspection Activities:

1	-	Check that gang drills are used to drill dowel bar holes as specified without damaging adjacent pavement.	100%
2	M	Check that the drill holes are cleaned as specified.	100%
3	-	Check that epoxy adhesive is injected into cleaned drill holes as specified.	100%
4	M	Check that dowel and tie bars are inserted as specified.	100%

363.07.~~08~~07.02 Precast Concrete Slab Installation ~~- Fort Miller Super Slab Method~~

Inspection Activities:

1	M	Check that slabs are installed using the appropriate guide bars and not pry bars or wedges.	100%
2	M	Check that the vertical differential between slabs meet the specified requirement. If the vertical differential exceeds the maximum requirement. Check that an appropriate action is taken until the differential meet the requirement prior to moving on to the next slab.	100%
3	-	Check that incompressible shims are used if the repair section will be opened to traffic prior to grouting.	100%

363.07.~~09~~07.03 Placing the Proprietary Patching Material

Inspection Activities:

~~**Dowel Grout and**~~

1	-	Check that foam grout dams are installed at open ends of transverse joints.	25%
2	-	Check that PPM is being mixed as specified.	25%
3	-	Check that PPM is being pumped and levels are monitored as specified.	50%

363.07.07.04 Placing the Bedding Grout ~~- Fort Miller Super Slab Method~~

Inspection Activities:

~~1~~	~~-~~	~~Check that grout dams are installed at open ends of transverse joints.~~	~~25%~~
~~2~~	~~-~~	~~Check that dowel grout is being mixed as specified.~~	~~25%~~
~~3~~	~~-~~	~~Check that dowel grout is being pumped and levels are monitored as specified.~~	~~50%~~
~~4~~	~~-~~	~~Check that bedding grout is installed after dowel grout.~~	~~50%~~
~~5~~	~~-~~	~~Check that bedding grout is mixed as specified.~~	~~25%~~
~~6~~	~~-~~	~~Check that bedding grout is being pumped as specified and that pressure is maintained until all voids under the slab are filled.~~	~~50%~~
~~7~~	~~M~~	~~Prior to the bedding grout fully sets, check that the top 50 mm of bedding grout in each port is removed and replaced with PCRM.~~	~~100%~~
~~8~~	~~-~~	~~Check that the PCRM level is flush with the surface of the slab and all excess materials removed immediately.~~	~~50%~~
1	-	Check that bedding grout is installed after dowel grout.	50%
2	-	Check that bedding grout is mixed as specified.	25%
3	-	Check that bedding grout is being pumped as specified and that pressure is maintained until all voids under the slab are filled.	50%

4	M	Prior to the bedding grout fully sets, Check that the top 50 mm of bedding grout in each port is removed and replaced with PPM.	100%
5	-	Check that the PPM level is flush with the surface of the slab and all excess materials removed immediately.	50%

363.07.~~10~~08 Tolerances

Inspection Activities:

1	M	Check that positions and alignment of dowel and tie bars are within the specified tolerances.	100%
2	M	Check that the surface tolerances are within the specified tolerance.	100%

363.07.~~11~~09 Joint Sealing

Inspection Activities:

1	-	Joint sealing ~~will be~~is inspected and administered according to CAIS 369.	50%

363.07.~~12~~ ~~Materials~~10 Materials Sampling and Testing

363.07.~~12~~10.01 General

Inspection Activities:

1	-	Check that field sampling is performed by a person certified according to OPSS 1350.	100%
2	-	Check that samples are accompanied by a complete MTO form PH-CC-322.	100%
3	-	Check that materials sampling and testing is as specified in CAIS 1355 for precast concrete slabs.	100%

Administrative Activities:

1	-	Check that all test results are received as specified.	-

~~Inspection Activities:~~

~~1~~2	~~-~~-	Check that ~~all samples including those handled by a commercial carrier~~test results for compressive strength, air void system and rapid chloride permeability are ~~labelled and accompanied by a sample data sheets/transmittal form~~received as specified in CAIS 1355 for precast concrete slabs.	~~25%-~~

363.07.1210.02 Compressive Strength of Concrete in Precast Slab

Inspection Activities:

1	-	Check that the concrete in precast slab is sampled at specified frequency, cured, handled, and delivery for compressive strength test as specified and administration/inspection according to CAIS 1350.	25%

363.07.12.03 Compressive Strength of Flowable Fill

Inspection Activities:

1	-	Check that the flowable fill is sampled at specified frequency, cured, handled, and delivery for compressive strength test as specified and administration/inspection according to CAIS 1350.	25%

Inspection Activities:

1	-	Check that the flowable fill is sampled as specified.	100%
2	-	Receive the test specimens, as specified, and deliver to the designated laboratory.	100%

363.07.12.04 Compressive Strength of Proprietary Concrete Repair Materials and 10.03 Bedding Grout

Inspection Activities:

1	-	Check that the PCRM is sampled at specified frequency, cured, handled, and delivery for compressive strength test as specified.	25%

363.07.12.05 Falling Weight Deflectometer Testing

Inspection Activities:

1	M-	Prior to QA FWD Testing arrangement, check the site condition so that the FWD Testing will not be carried out at the conditions that lead to invalid results (Refer to Section 3.6 - External Factors Influencing the Accuracy of FWD Testing).Check that bedding grout is tested and sampled as specified.	100%
2	M-	Identify and notify Provide stainless steel molds to the Contractor to remove barriers or obstructions onfor preparing the field that will impede the FWD testing12-hour compressive strength specimens.	50100 %
3	--	Check that the QA FWD testing is performed according to the procedures and requirements as outlined in the FWD Testing Guideline.Receive the test specimens, as specified, and deliver to the designated laboratory.	25100 %

363.07.10.04 Compressive Strength of Proprietary Patching Material

InspectionAdministrative Activities:

1	-	Falling Weight Defector (FWD) Testing for concrete slab QA acceptance is performed by the FWD Service Provider from the FWD Service Provider Approval list. Read and refer to MERO-053 Falling Weight Deflectometer (FWD) Testing Guideline for specified testing and contract administrator requirements.	-
21	-	Check that the FWD testing plan, location and frequency are selectedPPM is sampled as specified.	-100 %
32	--	Select the wheelpath for QA testing on the repaired concrete slab randomly and inform the QA FWD Testing Service Provider which wheelpath is selected.Provide stainless steel moulds to the Contractor for preparing the 28-Day compressive strength specimens. The Contractor provides the moulds for early strength determination.	-100 %
43	M-	Discuss with the QA FWD Testing Service Provider if the current site conditions do not meet the Testing requirement.Receive the test specimens for 28-Day compressive strength, as specified and deliver to the designated laboratory. The Contractor delivers the specimens for early strength determination.	-100 %
5	M	Notify the QA FWD Testing Service Provider that the site is ready for QA Testing.	-

363.07.13 Repair or Removal of Unacceptable Concrete11 Repairs

Inspection Activities:

1	-	Check the condition of the precast concrete slab and the existing adjacent pavement.	100%

Administrative Activities:

1	M	InformNotify the Contractor of any precast concrete slab and existing pavementspavement that does not meet the requirement are required to be rejected, repaired or removed and/or replaced.	-
2	-	Receive and Check the repair proposal submitted by the Contractor for the rejected work. Notify the Contractor in writing whether the proposal is acceptable.	-

363.07.1413 Management of Excess MaterialsMaterial

Inspection Activities:

1	-	Check the excess materials are managed as specified.	25%

Inspection Activities:

1	-	Check that management of excess material is as specified in the Contract Documents.	100%

363.08 QUALITY ASSURANCE

Inspection Activities:

1	M	Prior to and after installation, ~~Check that~~Inspect the precast concrete slabs ~~are free of any visual~~for defects as specified in OPSS 363. Prepare a report for the field inspection. Notify MTO's Quality Assurance Section of the presence of any defects.	100%
2	M	~~Prior to opening to traffic, verify if the completed work contains any defects including cracking, spalling, ungrouted overcuts, rocking of the slabs, failure to meet surface tolerance.~~For precast concrete slabs, Inspect the elements for defects or deficiencies as specified in OPSS 1355. Additional inspection activities shall be as specified in CAIS 1355.	100%

Administrative Activities:

1	-	Review all laboratory ~~testing~~test results. Determine acceptability of compressive strength of: - Flowable fill - Bedding grout - PPM	-
2	-	Forward acceptance test results for compressive strength to the Contractor as they become available.	-
~~2~~3	~~M~~-	~~Review the QA FWD testing results and ensure the invalid result is not being used for the FWD testing acceptance. When the QA FWD testing is not performed or cannot be used, CA should inform the Owner for using other means of appropriate measures to validate the dowel bars are properly installed for effective load transfer between concrete pavement slabs .~~If referee testing is invoked by the Contractor for compressive strength of the PPM, Check that it is invoked within 3 Business Days of receipt of the acceptance test result. If it is not within the specified time frame, Notify the Contractor in writing that the referee request is rejected.	-
4	-	Review the Contractor's request to invoke referee testing (including the original test results to verify they do not meet the specified quality assurance acceptance requirements) within 3 Business Days of receiving the results of that lot.	-
5	-	Complete MTO form PH-CC-885 Concrete Referee Testing Request and submit it to the MTO Quality Assurance Officer (QAO).	-

6	-	If the laboratory cannot complete referee testing in a reasonable timeframe, inform the QAO, who will provide another referee laboratory from the Engineering Materials Office (EMO) referee roster.	-
7	-	Submit a copy of the completed Referee Request Form provided by EMO to the referee laboratory by email.	-
8	-	Contract Administrator or QAO to contact the Area Quality Assurance laboratory and Notify them to ship the referee samples immediately to the referee laboratory.	-
9	-	Check that notification is received for samples arriving at the referee laboratory.	-
10	-	Once the schedule for referee testing has been finalized, provide the Contractor and QAO with the details of the referee laboratory, date and time of testing a minimum of 3 Business Days in advance of the date of referee testing.	-
11	-	Confirm that the Contractor will be witnessing the referee test (maximum of 2 people). The date is non-negotiable by the Contractor unless a change is formally requested by the MTO.	-
12	-	Once testing is complete, receive and Review the test results from the referee laboratory.	-
13	-	For referee testing, calculate the confirmation value and Determine whether the Contractor or the Owner bears the cost of referee testing, as specified in OPSS 363.	-
14	-	Forward referee test results to the Contractor as they become available.	-
15	-	Submit the referee test results together with a cover letter to the QAO.	-
16	M	Review the FWD testing results. Determine acceptability of FWD test results as specified in OPSS 366 and CAIS 366.	-
~~3~~17	M	If applicable, ~~notify~~Notify the Contractor of rejected pavement slabs based on ~~defect assessment~~defects from field inspection, FWD testing results, ~~concrete~~and compressive strength results~~, and/or air content results~~ of the materials listed above in task 1.	-
18	M	For precast concrete slabs, Check that quality assurance and acceptance is as specified in OPSS 1355. Check that precast concrete slabs meet the quality assurance requirement as specified in OPSS 1355, including acceptable 28-Day compressive strength, air void system parameters and rapid chloride permeability. For precast concrete slabs, additional administrative activities shall be as specified in CAIS 1355.	-
~~4~~19	--	~~Receive and Check~~Notify MTO's Quality Assurance Section for lots or work that fails to meet the ~~detail remedial plan submitted by~~acceptance requirements. Provide written notification to the Contractor~~ for the rejected work. Notify the Contractor~~, after consultation with MTO, for ~~approval status of the remedial~~rejectable lots or work~~ and proceed~~.	--

363.09 MEASUREMENT FOR PAYMENT

Administrative Activities:

1	-	Measurement for payment shall be as specified.	-

363.10 BASIS OF PAYMENT

Administrative Activities:

1	-	Basis of payment shall be as specified.	-

~~WARRANT: Always with OPSS 363, Construction Specification for Repairing Rigid Pavement with Precast Concrete Slabs~~