Construction Administrationve and Inspection Activities for Repairing Concrete Pavement and Concrete Base

(As Specified in OPSS 366 and SSP 103S57)

366.01 SCOPE

This CAIS covers the construction administration and inspection requirements for full depth and partial depth repairs of concrete pavement and concrete base using conventional concrete repairs, high early strength concrete repairs, and full-depth fast-track concrete repairs (full depth repair only) , to concrete pavement and concrete base as specified in OPSS 366, April 20232017, SSP 103S04, August 2021 and as amended in SSP 103S57, November 2025.

366.02 REFERENCES

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

Ontario Provincial Standard Specifications, Construction:

OPSS 366 Repairing Concrete Pavement and Concrete Base

MTO Standard Special Provisions:

SSP 103S04 Amendment to OPSS 366 - Falling Weight Deflectometer

Construction Administration and Inspection Specifications (CAIS):

CAIS 320 Open Graded Drainage Layer
CAIS 350 Concrete Pavement and Concrete Base
CAIS 369 Sealing or Resealing of Joints and Cracks in Concrete Pavement and Concrete Base
CAIS 904 Concrete Structures
CAIS 905 Steel Reinforcement for Concrete
CAIS 929 Abrasive Blast Cleaning - Concrete Construction
CAIS 1002 Aggregates – Concrete
CAIS 1010 Aggregates – Base, Subbase, Select Subgrade and Backfill Material
CAIS 1301 Cementing Materials
CAIS 1302 Water
CAIS 1308 Joint Filler in Concrete
CAIS 1315 White Pigmented Curing Compounds for Concrete
CAIS 1350 Concrete - Materials and Production
CAIS 1440 Steel Reinforcement for Concrete
CAIS 1441 Load Transfer Assemblies
CAIS 1442 Epoxy Coated Reinforcing Steel Bars for Concrete

Ontario Ministry of Transportation Publications:

MERO-053 Falling Weight Deflectometer (FWD) Testing Manual

MTO Forms:

PH-CC-885 Concrete Referee Testing Request Form
PH-CC-465 FWD Referee Testing Request Form

366.03 DEFINITIONS

For the purposes of this CAIS, the definitions shall be as specified in OPSS 366.

366.04 DESIGN AND SUBMISSION REQUIREMENTS

366.04.01 Design Requirements

366.04.01.01 Concrete Mix Design

366.04.02 Submission Requirements

366.04.02.01 Concrete Mix Design

Administrative Activities:

1	-	Check that the concrete mix design is received, Review the mix design and Check that it is as specified in OPSS 366 and OPSS 1350. ~~and meet the specified material for concrete requirement.~~ Additional administrative and inspection activities shall be according to the CAIS 1350.	-
~~2~~	~~-~~	~~Review the mix design and check for compliance as specified.~~	~~-~~
~~3~~2	-	Check that ~~specified~~ the linear shrinkage test data is received within the specified time frame from mix design submission and forward the data to the MTO's Quality Assurance Section.	-
3	-	If a new calibration chart is developed and submitted, Check that a mix design is also submitted prior to proceeding with concrete repairs. Review the mix design.	-

366.04.02.02 Calibration Charts and Autogenous Cylinder Method for Fast-T~~t~~rack Concrete Repairs

Administrative Activities:

1	-M	Check that the calibration chart is received at the time of concrete mix design submission and prior to ~~commencement of the trial area and~~ construction of the repair. Determine if a trial is required according to Trial Area for Fast-T~~t~~rack Concrete Repairs Subsection. If a trial area is required for fast-track concrete repair, Check that the calibration chart is received prior to commencement of the trial area.	-
2	-	Check that ~~the calibration chart is submitted along with~~ a letter signed by an Engineer that identifies the curing method, test method and details on the development of the calibration charts is submitted.	-
3	-	Review the calibration chart information and supporting test data, C~~c~~heck that the submissions are as specified in OPSS 366. ~~and~~ Check that the minimum length of time for the calibration charts is the period of lane closure specified in the Contract Documents.	-
4	-	In the event that field performance or conditions are no longer representative of the conditions under which the submitted calibration charts were developed, Check that the calibration charts, mix design and supporting information are resubmitted prior to proceeding with concrete repairs.	-

366.04.02.03 ~~Method of~~ Concrete Removal Plan ~~of Existing Concrete~~

Administrative Activities:

1	-	Check that a concrete removal plan ~~description of the removal process for existing concrete~~ is received within ~~a~~ the specified timeline ~~and prior to the start of work~~.	-
2	-	Review the ~~description~~concrete removal plan and C~~c~~heck the plan meets the requirement ~~for compliance~~ as specified in OPSS 366.	-
3	-	Notify the Contractor whether the concrete removal plan is acceptable or unacceptable.	-

366.04.02.04 Chipping Hammers

Administrative Activities:

1	-	Check that chipping hammer manufacturer's published specifications are received within ~~a~~ the specified timeline ~~and prior to the commencement of the partial depth removal operation~~.	-
2	-	Review the manufacturer's specifications and C~~c~~heck that it is ~~for compliance~~ as specified in OPSS 366.	-

366.04.02.05 Temperature Control Plans

366.04.02.05.01 Cold Weather

Administrative Activities:

1	-	In the event of cold weather condition, Check that the temperature control plans for all concrete, except fast-track concrete repair, is ~~hot and cold weather conditions are~~ received ~~prior to the placement~~.	-
2	-	Review the temperature control plan for ~~the event of repairs in~~ cold weather condition and Check ~~for compliance~~that the plan is according to OPSS 904. Additional administrative and inspection activities shall be according to the CAIS 904.	-

366.04.02.05.02 Hot Weather

Administrative Activities:

1	-	Check that a temperature control plan for hot weather conditions is submitted as specified and Review.	-

366.04.02.06 Curing Compound

Administrative Activities:

1	-	Check that curing compound submissions are as specified in OPSS 904. Additional administrative and inspection activities shall be according to the CAIS 904.	-

366.04.02.07 Effluent Management

Administrative Activities:

1	-	Check that effluent management submissions are as specified in OPSS 350. Additional administrative and inspection activities shall be according to the CAIS 350.	-

366.05 MATERIALS

~~Administrative Activities:~~

~~1~~	~~-~~	~~Review and check that materials to be used meets the materials requirements.~~ ~~Additional administrative and inspection activities shall be according to the CAIS specified below:~~ ~~• Used of Admixture as specified in CAIS 1350.~~ ~~• Portland Cement as specified in CAIS 1301.~~ ~~• Fine Aggregate as specified in CAIS 1002.~~ ~~• Curing Compound as specified in CAIS 1315.~~ ~~• Expansion Joint Filler as specified in CAIS 1308.~~ ~~• Joint Sealant as specified in CAIS 369.~~ ~~• Deformed Tie Bars as specified in CAIS 1440 and CAIS. 1442.~~ ~~• Dowel Bars and Load Transfer Device as specified in CAIS 1441.~~ ~~• Water as specified in CAIS 1302.~~	~~-~~

366.05.01 Bond Breaker

Administrative Activities:

1	-	Check that the bond breaker is as specified in OPSS 366.	-
2	-	If proposal using alternative type of material is received, Check with MTO's Quality Assurance Section.	-

366.05.02 Bonding Agent

Administrative Activities:

1	-	Check that the bonding agent is as specified in OPSS 366.	-

366.05.03 Burlap

Inspection Activities:

1	-	Check that the burlap is as specified in OPSS 366.	10%
2	-	Check that the burlaps have no tears or holes.	10%

366.05.04 Concrete

Administrative Activities:

1	-	Check that the concrete and materials for concrete are as specified in OPSS 366. Additional administrative and inspection activities shall be according to CAIS 1350. Additional administrative and inspection activities for aggregates used for concrete shall be according to CAIS 1002.	-

366.05.05 Curing Compound

Administrative Activities:

1	-	Check that the curing compound is as specified in OPSS 366.	-

366.05.06 Epoxy Adhesives

Administrative Activities:

1	-	Check that the epoxy adhesive is as specified in OPSS 366.	-

366.05.07 Expansion Joint Filler

Administrative Activities:

1	-	Check that the expansion joint filler is as specified in OPSS 366.	-

366.05.08 Moisture Vapour Barrier

Administrative Activities:

1	-	Check that the moisture vapour barrier is as specified in OPSS 366.	-

366.05.09 Proprietary Patching Materials

Administrative Activities:

1	-	Request the Ministry's List of Concrete Patching Materials from MTO's Quality Assurance Section.	-
~~1~~2	-	Check that the proprietary patching materials are suitable for the application and are from the Ministry's list.	-
~~3~~2	-	Verify the suitability of the proprietary patching material with MTO's Quality Assurance Section.	-

366.05.10 Tie Bars, Dowel Bars and Load Transfer Devices

Administrative Activities:

1	-	Check that tie bars and dowel bars are as specified in OPSS 366. Additional administrative and inspection activities shall be according to CAIS 1440.	-
2	-	Check that tie bars and dowel bars are epoxy coated as specified in OPSS 366. Additional administrative and inspection activities shall be according to CAIS 1442.	-
3	-	Check that load transfer devices are as specified in OPSS 366 and the Contract Documents.	-

366.05.11 Water

Administrative Activities:

1	-	Check that the water is as specified in OPSS 366. Additional administrative and inspection activities shall be according to CAIS 1302.	-

~~366.05~~366.06 EQUIPMENT

~~Inspection Activities:~~

~~1~~	~~M~~	~~Check that equipment to be used meets the equipment requirements. Additional administrative and inspection activities shall be according to the CAIS specified below:~~ ~~• Batching Plant and Delivery Equipment as specified in CAIS 1350~~	~~25%~~

366.06.01 Air Compressor

Inspection Activities:

1	-	Check that the air compressor is as specified in OPSS 366.	10%

366.06.02 Batching Plant and Delivery Equipment

Inspection Activities:

1	-	Check that the delivery equipment is as specified in OPSS 366. Additional administrative and inspection activities shall be according to CAIS 1350.	10%

Administrative Activities:

1	-	Check that the batching plant is as specified in ~~*Clause*~~ OPSS ~~06.01~~366. ~~-~~Additional administrative and inspection activities shall be according to CAIS 1350.	-

366.06.03 Chipping Hammer

Inspection Activities:

1	-	Check that the chipping hammer is as specified in OPSS 366.	10%

366.06.04 Diamond Grinder

Inspection Activities:

1	-	When a diamond grinder is used, Check that the diamond grinder is as specified in OPSS 366.	10%
2	-	Check that the effluent from diamond grinding operations is managed as per OPSS 366.	10%

366.06.05 Gang Drill

Inspection Activities:

1	-	Check that the gang drill is as specified in OPSS 366.	10%

366.06.06 Hand Finishing Equipment

Inspection Activities:

1	-	Check that the hand finishing equipment are as specified in OPSS 366.	10%

366.06.07 Placing, Consolidating and Finishing Equipment

Inspection Activities:

1	-	Check that the equipment for placing, consolidating, and finishing are as specified in OPSS 366.	10%

366.06.08 Straight Edge

Inspection Activities:

1	-	Check that the straight edge is as specified in OPSS 366.	10%

366.06.09 Thermocouples and Dataloggers

Inspection Activities:

1	-	Check that the thermocouples and associated instrumentation are as specified in OPSS 366.	10%

366.07 CONSTRUCTION

366.07.01 Autogenous Cylinder Method Calibration Charts for Fast-Tt~~r~~ack Concrete Repairs

Administrative Activities:

1	M	When ambient temperature or other conditions are different from the condition described in the submitted calibration chart, request new calibration chart.	-
2	M	Check that the calibration charts for fast-track concrete repair are developed as specified in OPSS 366.	-

366.07.02 Trial Area for Fast-Track Concrete Repairs

Inspection Activities:

1	-	Check that the fast-track trial concrete repair area simulates the Contract site conditions.	25%
2	-	Check that the calibration chart is developed for mix design strength versus temperature and mix design temperature versus time using the autogenous cylinder method as specified in OPSS 366.	25%
3	-	~~Check and w~~Witness sampling, ~~handling, storage,~~ labelling, packing ~~and delivery~~ of core samples ~~for testing are carried out according to the "Coring for Compressive Strength and Air Void System Parameters" clause.~~as specified in OPSS 366.	100%
4	-	Check that the Contractor has demonstrated an ability to complete fast-track concrete repair within the time frame of lane closure specified in the Contract Documents.	100%
~~6~~5	-	Inspect the fast-track trial area for deficiencies within 7 Days of placement.	100%

Administrative Activities:

1	M	When the trial area location for fast-track concrete repair is not specified in the Contract Documents, Check that the proposed trial area and location by the Contractor is acceptable.	-

2	M	Notify the Contractor of acceptance or rejection of the proposed trial area location.	-
3	-	Check that the fast-track full depth concrete repair is demonstrated a minimum of ~~1 week~~7 Days prior to any concreting operation.	-
4	M	Check that the cores, a transmittal form, and the MTO form PH-CC-433-A, Concrete Mix Design Submission Form A, the concrete mix design for the fast-track trial area are received.	-
45	-M	Notify the Contractor to proceed with fast-track concrete repairs when the Contractor has demonstrated successfully placement and meets all the requirement specified in OPSS 366.	-

366.07.0~~2~~3 Operational Constraints

366.07.0~~2~~3.01 General

Inspection Activities:

1	-	Check that operational constraints are as specified in OPSS 366.	100%
~~1~~	~~-~~	~~Check that the concrete is placed within the ambient air temperature and existing pavement temperature ranges as specified.~~	~~100%~~
~~2~~	~~-~~	~~When ambient temperature or other conditions vary by the amounts specified in the submitted calibration chart, request new calibration charts~~	~~100%~~
~~3~~	~~-~~	~~Check that vehicles are not permitted to drive in areas where concrete or concrete base is removed.~~	~~50%~~
~~4~~	~~-~~	~~Check that existing concrete is being protected from steel track equipment.~~	~~50%~~
~~5~~	~~-~~	~~Check that concrete pavement/base is protected from damage to the surface at all times. Traffic, except rubber tire saw cutting equipment and foot traffic, are not permitted on the repair areas until the concrete has achieved a specified compressive strength.~~	~~50%~~

Administrative Activities:

1	M	Check that a notice of intent to repair the concrete pavement or concrete base is received from the C~~c~~ontractor within the timeline specified ~~prior to commencement of the repair work~~ in OPSS 366. ~~within the timeline specified~~	-

366.07.0~~2~~3.02 Concrete Base Repairs

Inspection Activities:

1	M	Prior to arranging for FWD testing, Check that the site conditions are acceptable for FWD testing as specified in MERO-053, Section 3.6.	100%
2	-	Check that the exposed concrete base is power swept prior to visual inspection and FWD testing.	100%
3	-	Check that equipment which may cause vibration in the pavement structure is not used within 100 metres of the FWD test area.	100%
4	M	Identify and Notify the Contractor to remove any barriers or obstructions on site that will interfere with the FWD testing.	100%
5	-	Check that the FWD testing is carried out according to LS-449, MERO-053 and Contract Administrator Services Assignment.	25%

Administrative Activities:

1	M	For concrete base repairs, receive notification of asphalt pavement removal as specified in OPSS 366.	-
2	M	Arrange visual inspection and/or FWD testing on exposed concrete base surface after receiving notification of asphalt removal timing from the Contractor. The visual inspection and/or FWD Testing on the exposed concrete base surface shall be carried out no later than 3 Business Days after the area has been power swept. If the deadline cannot be met due to weather conditions, the Contract Administrator shall propose a new timeline acceptable to the Owner.	-
3	M	Check that FWD testing is performed by a service provider from the List of Approved Falling Weight Deflectometer (FWD) Testing Service Providers. Refer to LS-449, MERO-053 for specified testing, and Contract Administrator Service Assignment.	-
4	M	FWD Data Analysis Report shall be provided to the MTO within 3 Business Days of completion of the fieldwork.	-

366.07.03.03 High Early Strength Concrete Repairs

Inspection Activities:

1	-	Check that high early strength concrete repairs are completed within the time period as specified in the Contract Documents.	100%
2	-	Check whether the high early strength concrete repair is progressing at a rate that will permit the full restoration of traffic within the specified time period.	100%
3	-	Check the temporary work is replaced by the high early strength concrete repair during the next schedule closure.	100%

Administrative Activities:

1	-	When the high early strength repair work is not progressing at a rate that will permit traffic restoration, Notify the Contractor that temporary measures need to be used.	-
2	-	Review the Contractor's proposed temporary measures and Notify the Contractor if the plan is acceptable or unacceptable.	-

366.07.03.04 Fast-Ttrack Concrete Repairs

Inspection Activities:

1	-	Check that fast-track concrete repairs ~~is~~are ~~placed~~ completed within the time period as specified ~~timeframe~~ in the Contract Documents.	100%
2	-	Check ~~if~~ whether the fast-track concrete repair is progressing at a rate that will permit the full restoration of traffic within the specified ~~allowable~~ time period.	100%
3	-	Check the temporary works is replaced by the fast-track concrete repair during the next schedule closure.	100%

Administrative Activities:

1	-	Check that fast-track concrete repairs are not placed between Oct 1 and May 1.	100%
~~1~~2	-	When the ~~precast~~ fast-track concrete ~~slab replacement~~repair work is not progressing at a rate ~~does not allow for~~that will permit traffic restoration, Notify ~~communicate to~~ the Ccontractor that temporary measures need to be used. ~~to fully restore traffic in the timeline.~~	-
~~2~~3	-	Review the ~~c~~Contractor's proposed temporary measures and N~~n~~otify the C~~c~~ontractor if the plan is acceptable or unacceptable.	-

366.07.0~~4~~3 Concrete Removal

366.07.~~03~~04.01 Full Depth ~~and Fast-Track~~ Repairs

Inspection Activities:

~~1~~	~~M~~	~~Check that full depth removal areas or with fast-track repair areas are marked as specified. Repairs shall extend the full width of the lane~~	~~100%~~
1	M	Identify and demarcate the full depth removal areas. Notify and consult with MTO's Quality Assurance Section if there are any discrepancies between the design and the existing conditions.	100%
~~2~~	~~-~~	~~Check that outer limit of removal area is clean and sawcut to full depth and that cuts do not exceed the overcut requirement.~~	~~100%~~
2	-	Check that concrete removal for full depth repairs is as specified in OPSS 366.	100%
~~3~~	~~-~~	~~Check that overcuts are filled with epoxy resin acceptable to the owner.~~	~~50%~~
~~4~~	~~-~~	~~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%~~
~~5~~	~~M~~	~~Check that concrete removal is by lifted-out method without breaking in place and damaging adjacent concrete pavement of disturbing the underlying base.~~	~~50%~~
~~6~~3	-	When the adjacent concrete in the lane is damaged or cracked due to the removal procedure, direct to cut back and repair as specified ~~is required~~. Check the repair ~~for damaged adjacent concrete~~, Nnotify the Cc~~o~~ntractor for acceptance or rejection.	100%
~~7~~4	-	~~When~~ Check that underlying materials ~~below the concrete pavement/base is~~ disturbed, ~~or~~ removed, or damaged ~~during removal,~~ are repaired and/or replaced as specified. ~~check that voids are filled with Granular O meeting the specified requirement and compacted as specified.~~ Additional administrative and inspection activities shall be according to CAIS 320 for OGDL and CAIS 1010 for granular materials.	50%

366.07.~~03.02~~04.02 Partial Depth Repairs

Inspection Activities:

~~1~~	~~M~~	~~Check that partial depth removal areas are marked as specified.~~	~~100%~~
1	M	Identify and demarcate the partial depth repair areas. Notify and consult with MTO's Regional Quality Assurance Section if there are any discrepancies between the design and the existing conditions.	100%
~~2~~	~~-~~	~~Check that the perimeter of the repair areas is sawcut vertically to the depth specified.~~	~~50%~~

2	-	Check that concrete removal for partial depth repairs is as specified in OPSS 366.	100%
~~3~~	~~-~~	~~Check that concrete within the sawcut areas is removed by chipping hammer to the specified depth range specified.~~	~~25%~~
~~4~~	~~-~~	~~Check that any wire mesh is removed as specified.~~	~~25%~~
~~5~~3	M	~~When the partial depth concrete removal operation reveals deterioration extending to a depth greater than the maximum specified depth for partial depth repairs, the repair shall be treated as a full depth repair or fast-track repair. Check that the contractor asks for approval to proceed with a full depth repair or fast-track repair.~~ When the Contractor proposed to replace a partial depth repair with a full depth repair, Notify the Contractor of acceptance or rejection.	50%
~~6~~	~~-~~	~~Notify the Contractor for approval and check that no repair work proceeds without prior approval.~~	~~50%~~

366.07.0~~5~~4 Preparation Work

~~**366.07.04.01 Full Depth and Fast-Track Repairs**~~

Inspection Activities:

~~1~~	~~-~~	~~Check that granular base is wet down immediately ahead of the concrete placement operation.~~	~~50%~~
~~2~~	~~-~~	~~Check that the wetting down does not leave standing water.~~	~~50%~~
1	-	Check the preparation work for full depth repairs and partial depth repairs are as specified in OPSS 366.	100%

~~**366.07.045.02 Partial Depth Repairs**~~

~~Inspection Activities:~~

~~1~~	~~-~~	~~Check that all concrete surfaces to receive new concrete are abrasive blast cleaned as specified. Abrasive blast cleaning shall be administered according to applicable component of CAIS 929.~~	~~50%~~
~~2~~	~~-~~	~~Immediately prior to wetting the concrete surface, check that all dust and loose material are removed with compressed air.~~	~~50%~~
~~3~~	~~-~~	~~Check that the surface of the patch to receive new concrete is maintained in the wet condition for the specified time prior to placing new concrete.~~	~~50%~~
~~4~~	~~-~~	~~Check that prior to placing new concrete, excess water is removed from the surface using compressed air.~~	~~50%~~
~~5~~	~~-~~	~~Immediately prior to filling the repair area with concrete, check that bonding agent is applied/reapplied as specified and that excess agent is removed.~~	~~50%~~

366.07.0~~6~~5 Joints for Full Depth Repairs

366.07.06.01 General

Inspection Activities:

1	-	Check that joints for concrete pavement and concrete base are as specified in OPSS 366.	100%

366.07.0~~5~~6.02~~1~~ Installation of Dowel Bars and Tie Bars~~Full Depth and Fast-Track Repairs~~

366.07.06.02.01 General

Inspection Activities:

~~1~~	~~-~~	~~Check joints for concrete pavement and concrete base are made as specified. Additional administration and inspection activities shall be according to CAIS 350.~~	~~50%~~
~~2~~	~~-~~	~~Check that dowel bars and tie bars are installed at locations specified, adjusted accordingly where reinforcement is present and within the specified allowable tolerances.~~	~~100%~~
~~3~~	~~-~~	~~Check that holes for are drilled to the size specified.~~	~~50%~~
~~4~~	~~M~~	~~Check that the drill holes are cleaned as specified.~~	~~100%~~
~~5~~	~~-~~	~~Check that adhesive is injected into cleaned holes with grout retention disks attached as specified.~~	~~100%~~
~~6~~	~~-~~	~~Check that dowel and tie bars are inserted as specified.~~	~~100%~~
1	-	Check that installation of dowel bars and tie bars are as specified in OPSS 366.	100%
2	-	Check that the dowel bars and load transfer devices (when applicable) are shop-coated with an accepted bond breaker by checking the tag on the dowel bar bundles and by visually checking the surface of the dowel bars and load transfer devices.	100%
~~7~~3	-	Check that adhesive is fully cured prior to placing concrete by pulling a couple of bars.	~~10~~250 %
~~8~~	~~-~~	~~Check that bond breaker is applied to the free end of dowel bars immediately before placing concrete.~~	~~100%~~

366.07.06.02.02 Installation Tolerances

Inspection Activities:

1	-	Check that dowel bars and tie bars are installed within the specified allowable installation tolerances specified in OPSS 366.	100%

366.07.~~05.01.03~~06.03 Transverse Joints

Inspection Activities:

1	-	Check that transverse joints are ~~made~~ as specified in OPSS 366.	100%
2	-	Check that the expansion joints is placed and/or replaced as specified in OPSS 366.	50%

366.07.~~05.01.04~~06.04 Mid-Lane Longitudinal Joints for Fast-T~~t~~rack Concrete Repairs

Inspection Activities:

1	-	Check that the mid-lane longitudinal joints are ~~is made~~ as ~~required and as~~ specified in OPSS 366.	100%
~~2~~	~~-~~	~~Check that tie bar meets specified requirement and is placed as specified~~	~~100%~~

366.07.~~05.01.05~~06.05 Sawcutting, Cleaning and Sealing of Joints

Inspection Activities:

1	-	Check that saw~~-~~cutting, cleaning and sealing of joint ~~operations~~ are ~~is performed~~carried out as specified in OPSS 366. Administrative and inspection activities shall be according to the CAIS 369.	~~50~~100 %

366.07.0~~6~~7 Production of Concrete

Inspection Activities:

1	-	Check that production of concrete is as specified in ~~produced according to~~OPSS 366~~1350~~. Additional ~~administration~~ administrative and inspection activities shall be according to CAIS 1350.	~~50%~~ 100%

366.07.0~~7~~8 Placing of Concrete

Inspection Activities:

1	-	If demonstration of the equipment is required, ~~Prior to placing concrete, if applicable, request a~~Inspect the demonstration of ~~that~~ the placing equipment and Check that ~~to be used~~ the trial section meets the specified requirements ~~can achieve the required end product~~.	~~25~~100 %
2	-	Check that the placing of concrete is ~~delivered according to~~as specified in OPSS 366~~1350~~. Additional administrative~~on~~ and inspection activities shall be according to CAIS 350~~1350~~.	50%
~~3~~	-	~~Check that concrete is placed according to OPSS 130 with exceptions and additions as specified. Additional administration and inspection activities shall be according to CAIS 1350.~~	~~100%~~

Administrative Activities:

1	-	Consult with MTO's Quality Assurance Section to determine if a demonstration of ~~that~~ the placing equipment to be used is required.	-
2	-	Notify the Contractor whether the demonstration is required.	-

366.07.~~08~~09 Consolidating

Inspection Activities:

1	-	Check that consolidating of concrete is ~~consolidated~~ as specified in OPSS 366.~~according to OPSS 350. Additional administration and inspection activities shall be according to CAIS 350.~~	50%

366.07.10~~09~~ Concrete Finishing

Inspection Activities:

1	-	Check that concrete ~~is finished~~finishing is as specified in OPSS 366.	50%

366.07.~~10~~11 Texturing of Pavement Surface

Inspection Activities:

1	-	Check that texturing of pavement surface ~~concrete is textured according to~~is as specified in OPSS 366~~350 with exceptions specified~~.~~Additional administration and inspection activities shall be according to CAIS 350~~.	~~25~~50 %

~~366.07.11 Surface Tolerance~~

~~Inspection Activities~~

~~1~~	~~-~~	~~Check that the surface of the concrete repair joints flush with existing concrete pavement or concrete base.~~	~~50%~~
~~2~~	~~-~~	~~Check that the surface of the concrete is tested by straightedge and meet the surface tolerance requirement as specified.~~	~~50%~~

~~Administrative Activities:~~

~~1~~	~~M~~	~~Prior approval is required for the use of diamond grinding to meet the surface tolerance requirements. Check that a request of using diamond grinding is received and notify the Contractor for approval status~~	~~50%~~

366.07.12 Curing

Inspection Activities:

1	-	Check that curing is ~~applied~~ as specified in OPSS 366.~~For non-fast-track repairs, additional administration and inspection activities for curing shall be according to CAIS 904.~~	50%

366.07.13 Retaining Heat for High Early Strength Concrete and Fast-Track Concrete Repairs

Inspection Activities:

1	-	~~Check that insulating blankets or protection systems are used as specified~~ in ~~OPSS 366.~~ No inspection activities.	~~100%~~

366.07.14 Cold Weather Protection – ~~Full Depth and Partial Depth~~Conventional and High Early Strength Concrete Repairs

366.07.14.01 General

Inspection Activities:

1	-	Check that cold weather protection is as specified in OPSS 366.	100%

~~Administrative Activities:~~

~~1~~	~~-~~	~~Check that datalogger temperature records and a record of any actions taken to maintain control of temperature are received as specified.~~	

~~Inspection Activities:~~

~~1~~	~~-~~	~~Except for fast track repairs, check that the concrete temperature during cold weather is monitored and controlled as specified.~~	~~50%~~
~~2~~	~~-~~	~~Check that cold weather protection systems are designed as specified and can be modified as required.~~	~~50%~~
~~3~~	~~-~~	~~Check that the cold weather measures meet the specified requirement according to OPSS 904.~~	~~50%~~
~~4~~	~~-~~	~~Check that thermocouples are installed as specified.~~	~~100%~~
~~5~~	~~-~~	~~Check that temperature data is logged, monitored, and verified on site in person by Contractor as specified.~~	~~25%~~
~~6~~	~~-~~	~~Check that all necessary action is taken in order to maintain the temperature within the specified limits.~~	~~50%~~

366.07.14.02 Monitoring and Control of Temperature

Inspection Activities:

1	-	Check that monitoring and control of temperature is as specified in OPSS 366.	100%

366.07.14.03 Submission of Temperature Records

Administrative Activities:

1	-	Receive and Review the submitted temperature records. Notify MTO's Quality Assurance Section if any specified requirements are not met.	-

~~**366.07.15 Joint Sealing**~~

~~Administrative Activities:~~

~~1~~		~~Joint sealing shall be administered and inspected according to CAIS 369.~~	-

366.07.15 Surface Tolerance

Inspection Activities:

1	-	Check that the surface tolerance is as specified in OPSS 366.	50%

Administrative Activities:

1	M	Prior approval is required for the use of diamond grinding to meet the surface tolerance requirements. If applicable, Check that a request to use diamond grinding is received and Notify the Contractor of approval status.	-

366.07.16 Material Sampling and Testing

366.07.16.01 Slump, Air Content and Temperature

~~Administration~~ Inspection Activities:

1	~~1.~~ -	Check that plastic concrete sampling, testing, acceptance and field adjustments, visual acceptance and submission of plastic concrete test results are ~~according to the "Material Sampling and Testing" requirement of OPSS 1350 with specified exceptions and additions~~ as specified in OPSS 366. Additional administrative and inspection activities shall be according to CAIS 1350.	50%

366.07.16.02 Coring for 28-Day Compressive Strength and Air Void System Parameter Testing

Inspection Activities:

1	M	Check and Wwitness sampling, handling, storage, labelling, and packing of core samples as specified in OPSS 366.and delivery of core samples for testing as specified	100%
2	-	Check that each sample hole is filled as specified in OPSS 366. -Additional administrative and inspection activities shall be according to CAIS 1350.	100%

Administrative Activities:

1	M	Select random core sample sampling locationsand Nnotify the Contractor of the sample locations as specified.	-
2	M	Receive the cores, a transmittal form, and the MTO form PH-CC-433-A, Concrete Mix Design Submission Form A, the concrete mix design for the concrete pavement or concrete base.	-
3	M	Deliver the core samples to the designated laboratory for testing.	-

366.07.16.03 Early Strength Determination for Conventional Concrete Repairs Other than Fast Track

Inspection Activities:

1	-	Check and wWitness sampling, handling, storage, labelling, and packing and delivery of core samples for testing are carried out according to the "Coring for Compressive Strength and Air Void System Parameters" clauseas specified in OPSS 366.	100%
2	-	Check that each sample hole is filled as specified in OPSS 366. Additional administrative and inspection activities shall be according to CAIS 1350.	100%

Administrative Activities:

1	M	For conventional concrete repairs other than fast track repair, the Contractor may elect to take cores for early strength determination. -Check anthat advance notice of coring for early strength determination is received and arrange testing with the designated quality assurance laboratory.	50%-
3	M	Deliver the core samples to the designated laboratory for testing.	-

366.07.16.04 Early Strength Determination for High Early Strength Repairs

Inspection Activities:

1	-	Check that the cylinders for early strength determination for high early strength repairs are prepared and delivered as specified.	50%
2	-	Check that the repairs are only opened to the traffic when early strength determination cylinders have attained an average compressive strength of 20 MPa or greater.	50%

Administrative Activities:

1	-	Receive notification from the Contractor for the date and time for early strength determination for cylinders. Arrange with the designated laboratory for testing of samples delivered by the Contractor.	-
2	-	Check that the compressive strength test results are received for each closure prior to re-opening the lane to traffic.	-

366.07.16.05 Early Strength Determination for ~~High Early Strength and~~ Fast-T~~t~~rack Concrete Repairs

Inspection Activities:

1	-	Check that the autogenous cylinders for early strength determination for fast-track concrete repairs are prepared as specified.	50%
2	-	Check that thermocouple or sensors are installed as specified.	100%
3	-	Verify temperature readings periodically.	25%
4	-	Check that the repaired slab is only opened to the traffic when the slab temperature has reached at least the same temperature as the cylinders which attained a compressive strength of 20 MPa or greater.	50%

Administrative Activities:

1	-	Check that the concrete testing laboratory meets the requirement specified in OPSS 366.	-

2	-	Receive the temperature record for the repaired slab and autogenous cylinders, and the compressive strength test results for each closure prior to re-opening the lane to traffic.	-

~~**366.07.17 Special Requirements for Fast-Track Repairs**~~

~~**366.07.17.01 Trial Area for Fast Track Repairs**~~

~~Administrative Activities:~~

~~1~~	~~M~~	~~When the trial area for fast track repair is not specified in the Contract Document, check the proposed trial area and location selected by the Contract meet the specified requirement.~~	~~-~~
~~2~~	~~M~~	~~Notify the contractor of acceptance or rejection of the proposed trial area location.~~	~~-~~
~~3~~		~~Notify the contractor to proceed with fast track repairs when the Contractor has demonstrated successfully placement and meet all the requirement specified.~~	~~-~~

~~Inspection Activities:~~

~~1~~	~~-~~	~~Check that the fast track trial repair area simulates the Contract site conditions.~~	~~25%~~
~~2~~	~~-~~	~~Check that the Contractor has verified the calibration chart as specified.~~	~~25%~~
~~3~~	~~-~~	~~Check and witness sampling, handling, storage, and packing and delivery of core samples for testing are carried out according to the "Coring for Compressive Strength and Air Void System Parameters" clause.~~	~~100%~~
~~4~~	~~-~~	~~Check that the trial repair area remains exposed for the duration specified.~~	~~100%~~
~~5~~	~~-~~	~~Check for deficiencies on fast track trial area.~~	~~100%~~
~~6~~	~~-~~	~~Check that the Contractor has demonstrated an ability to complete fast track repair within the time frame of lane closure specified in the Contract Document.~~	~~100%~~

~~**366.07.17.02 Early Strength Determination for Fast-Track Repairs**~~

~~Administrative Activities:~~

~~1~~		~~Check that the autogenous cylinders and compressive strength test results for the repair area of each lane closure are received.~~	~~-~~
~~2~~		~~Check the concrete testing laboratory meets the specified laboratory requirement.~~	~~-~~
~~3~~		~~Check that temperature record of the repair slab for each lane closure and prior to re-opening the lane to traffic is received.~~	~~-~~

~~4~~		~~Check that the repaired slab is only opened to the traffic when the slab temperature has reached the temperature specified for the required compressive strength.~~	~~-~~

~~**366.07.17.03 Monitoring and Control of Fast-Track Repairs**~~

~~Inspection Activities:~~

~~1~~		~~Check that thermocouples are installed and monitored as specified.~~	~~100%~~

366.07.1718 Unacceptable Repair Areas

Inspection Activities:

1	M	Check that concrete found to be unacceptable is removed and replaced with new concrete, as ~~to the~~ specified ~~extend~~ in OPSS 366.	100%

Administrative Activities:

1	-	When concrete does not meet the surface tolerance, correction by diamond grinding in lieu of removal and replacement may be accepted. ~~-~~Check that the request ~~of~~to us~~e~~ing diamond grinding is received.	-
2	-	Check that the use of diamond grinding is approved by the Owner and N~~n~~otify the C~~c~~ontractor.	-

366.07.18 Management of Excess Material

Inspection Activities:

1	-	Check the excess materials are managed as specified in OPSS 366.	25%

366.08 QUALITY ASSURANCE

366.08.01 Acceptance of Concrete Pavement and Concrete Base Repairs

Inspection Activities:

1	-	Check that all the specified requirements are met.	100%
2	M	Check that all rejected areas/lots are removed and replaced or repair if accepted by the Owner.	100%

Administrative Activities:

1	-	Notify MTO's Quality Assurance Section of any requirement that are not met.	-

366.08.~~01~~02 Lot Size for 28-Day Compressive Strength and Air Void System Acceptance Testing

Administrative Activities:

1	-	Establish the sizes and numbers of concrete lots as specified in OPSS 366 and Notify the Contractor.	-

366.08.~~02~~03 Acceptance of 28-~~-~~Day Compressive Strength

366.08.03.01 General

Inspection Activities:

1	-	Check that rejected concrete lots ~~is~~are removed and replaced as specified.	100%

Administrative Activities:

1	-	Check and R~~r~~eview compressive strength test results for each lot.	-
2	-	Forward the test result to the Contractor as they become available.	-
3	-	Notify MTO's Quality Assurance Section for any unacceptable lot.	-
~~3~~4	M	Notify the C~~c~~ontractor of unacceptable and acceptable lots as necessary. Unacceptable lots shall be rejected, removed and replaced.	-

366.08.0~~23~~.~~01~~02 Referee Testing ~~of Compressive Strength~~

366.08.03.02.01 General

Inspection Activities:

1	M -	~~Check and W~~witness sampling, ~~handling, storage,~~ labelling, ~~and~~ packing of core samples ~~and delivery of samples for testing~~ as specified in OPSS 366.	100%
2	-	Check that each sample hole is filled as specified in OPSS 366. Additional administrative and inspection activities shall be according to CAIS 1350.	100%

Administrative Activities:

1	M	Check that a written request to invoke referee testing is received as specified in OPSS 366.	-
2	M	Perform the referee workflow as specified in CAIS 100, MTO Construction Administration General Conditions (CAGC).	100%
3	-	Complete MTO form PH-CC-885 Concrete Referee Testing Request and submit it to the MTO's Quality Assurance Section.	-
~~1~~4	-	Check referee testing process is performed as specified~~according to OPSS 1350 and check for exceptions~~. Additional administrative and inspection activities shall be according to the CAIS 1350.	-
~~2~~5	-	Check that the new set of cores are obtained within ~~a~~the specified timeframe of invoking referee testing.	-
6	-	Forward the referee test results to the Contractor as they become available.	-

366.08.03.02.02 Referee Testing Cost

Administrative Activities:

1	-	Determine who is responsible for the referee testing cost.	-

366.08.~~04~~03 Acceptance of Air Void System in ~~Hardening~~Hardened Concrete

366.08.04.01 General

Inspection Activities:

1	-	Check that rejected concrete lots ~~is~~are removed and replaced as specified.	100%

Administrative Activities:

1	-	Check and R~~r~~eview air void system test results for each lot.	-
2	-	Forward the test result to the Contractor as they become available.	-
3	-	Notify MTO's Quality Assurance Section for any unacceptable lot.	-
~~4~~3	M	Notify the C~~c~~ontractor of unacceptable and acceptable lots as necessary. Unacceptable lots shall be rejected, removed and replaced.	-

366.08.~~03.01~~04.02 Referee Testing~~of Air Void System in Hardened Concrete~~

366.08.04.02.01 General

Inspection Activities:

1	M	Perform the referee workflow as specified in CAIS 100, MTO Construction Administration General Conditions (CAGC).	100%

Administrative Activities:

1	M	Check that a written request to invoke referee testing is received as specified in OPSS 366.	-
2	M	Perform the referee workflow as specified in CAIS 100, MTO Construction Administration General Conditions (CAGC).	100%
3	-	Complete MTO form PH-CC-885 Concrete Referee Testing Request and submit it to the MTO's Quality Assurance Section.	-
~~1~~4	-	Check referee testing process is performed as specified. Additional administrative and inspection activities shall be according to the CAIS 1350.	-
~~2~~5	-	Forward the referee test results to the Contractor as they become available.	-

366.08.04.02.02 Referee Testing Cost

Administrative Activities:

1	-	Determine who is responsible for the referee testing cost.	-

366.08.~~04~~05 Falling Weight Deflectometer Acceptance Testing

366.08.05.01 General

Inspection Activities:

1	M	Prior to arranging for Quality Assurance (QA) FWD ~~Testing~~ testing ~~arrangement~~, Ccheck the site condition ~~so that the FWD Testing will not be carried out at~~are acceptable for FWD testing ~~the conditions that lead to invalid results. (Refer to~~ as specified in MERO-053, Section 3.6~~ – External Factors Influencing the Accuracy of FWD Testing outline in the FWD Testing GuidelineMERO)~~.	100%
2	-	Check that equipment which may cause vibration in the pavement structure is not used within 100 metres of the FWD test area.	100%
~~2~~3	M	Identify and ~~n~~Notify the Contractor to remove barriers or obstructions on the field that will ~~impede~~ interfere with the QA FWD testing.	~~50~~100 %

43	-	Check that the QA FWD testing is performed carried out according to the procedures and requirements as outlined in the FWD Testing GuidelineLS-449, MERO-053 and Contract Administrator Service Assignment.	25100 %

Administrative Activities:

1	M	Receive, from the Contractor, written notification that the repaired concrete section condition is sufficient to support traffic loading.	-
12	-	Check that Falling Weight Defector (FWD) Ttesting for concrete slab QA acceptance is performed by the FWD a Sservice pProvider from the Approved List of FWD Testing Service ProvidersFWD Service Provider Approval list. Read and rRefer to LS-449 and MERO-053 Falling Weight Deflectometer (FWD) Testing Guideline for specified testing and cContract aAdministrator requirements.	-
3	-	The QA FWD Service Provider shall carry out the FWD testing when the repair concrete section condition is sufficient to support traffic loading and no later than 5 Business Days after a repaired section is completed. If the deadline cannot be met, the Contract Administrator CA shall propose a new timeline acceptable to the Owner.	-
24	-	Check that the FWD testing plan, location and frequency are selected as specified.	-
35	-	Select the wheelpath for QA testing on the repaired concrete slab randomly and inform the QA FWD Testing Service Provider which wheelpath is selected.	-
46	M	Discuss with the QA FWD Testing Service Provider if the current site conditions do not meet the testing requirement.	-
57	M	Notify the QA FWD Testing Service Provider that the site is ready for QA for Ttesting.	-
8	M	Mark the location of the FWD loading plate and first sensor for each test, to verify that the FWD is placed in the same location with the same sensor arrangement for referee testing, if invoked.	100%
9	M	Check the QA FWD results. Provide FWD Data Analysis Rreport to the MTO's Quality Assurance Section and Contractor within 3 Business Days of completion of the fieldwork.	100%

366.08.0405.0102 Falling Weight Deflectometer Referee Testing

Administrative Inspection Activities:

1	M	Perform the referee workflow as specified in CAIS 100, MTO Construction Administration General Conditions (CAGC).	100%

~~1~~2	--	Check referee testing process is performed as specified.	- 100%
~~2~~	-	~~Forward the referee test result to the Contractor as they become available.~~	-
3	-	Check that the FWD loading plate and first sensor are placed at the same location as the sensor arrangement marked for QA FWD Testing.	100%

Administrative~~on~~ Activities:

1	-M	Check that a written request to invoke referee testing is received as specified.	-
2	-	Complete MTO form PH-CC-465 FWD Referee Testing Request and submit it to ~~the~~ MTO's Quality Assurance Section.	-
3	-	Forward the referee test results to the Contractor as they become available.	-

366.08.05.03 Referee Testing Cost

Administrative Activities:

1	-	Determine who is responsible for the referee testing cost.	-

366.08.~~05~~06 Acceptance of Surface Tolerance

Inspection Activities:

1	-	Check all repaired areas to ~~ensure~~ verify that the surface tolerance requirements are met.	100%

Administrative Activities:

1	M	Notify the C~~c~~ontractor of any repair areas that do not meet the surface tolerance specifi~~cation~~ed. Unacceptable repair areas shall be rejected, removed, and replaced.	-
2	-	Concrete that does not meet the surface tolerance may be corrected by diamond grinding in lieu of removal and replacement. ~~-~~Check that ~~if such~~a request is submitted and approved by the Owner.	-

366.08.~~06~~07 Defects

Inspection Activities:

1	-	Check all repair areas are free of defects as specified in OPSS 366. ~~for visible surface cracks, visible deficiencies, honeycombing, or partial depth repairs that are debonding by sounding, and any other defects specified.~~	100%
2	-	Check that unacceptable repair areas shall be rejected, removed, and replaced.	100%

Administrative Activities:

1	M	Notify the ~~C~~contractorMTO's Quality Assurance Section of the presence of any ~~of the specified~~ defects.~~Unacceptable repair areas shall be rejected, removed, and replaced.~~	-
2	-	Notify the Contractor of the presence of any defects.	-

~~**366.08.07 Acceptance or Rejection**~~

~~Administrative Activities:~~

~~1~~	~~-~~	~~Check and review the acceptance and rejection requirements.~~	~~-~~
~~2~~	~~-~~	~~Notify the contractor of any of the rejected areas/lots.~~	~~-~~

~~Inspection Activities:~~

~~1~~	~~-~~	~~Check that appropriate action for the rejected lot is taken by the contractor.~~	~~100%~~
~~2~~	~~M~~	~~Check all the rejected areas/lots are removed/replaced/corrected to meet the quality requirement as specified.~~	~~100%~~

366.09 MEASUREMENT FOR PAYMENT

Administrative Activities:

1	-	Measurement for payment shall be as specified in OPSS 366.	-

366.10 BASIS ~~FOR~~ OF PAYMENT

Administrative Activities:

1	-	Basis ~~for~~ of payment shall be as specified in OPSS 366.	-

~~WARRANT: Always with OPSS 366, Construction Specification for Repairing Concrete Pavement and Concrete Base~~