Administration and Inspection Activities for Concrete Structures

(As Specified in OPSS 904 and SSP 109S18)

904.01 SCOPE

This CAIS covers the construction administration and inspection requirements for concrete structures as specified in OPSS 904, November 2019, and SSP 109S18, October 2020.

904.02 REFERENCES

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

Ontario Provincial Standard Specifications, Construction:

OPSS 904	Construction Specification for Concrete Structures
OPSS 905	Concrete Reinforcement
OPSS 920	Deck Joint Assemblies, Waterstops, Joint Fillers, Joint Seals and Joint Sealing Compounds - Structures
OPSS 929	Abrasive Blast Cleaning - Concrete Construction

Ontario Provincial Standard Specifications, Materials:

OPSS 1002	Aggregates - Concrete
OPSS 1202	Bearings - Elastomeric Plain and Steel Laminated
OPSS 1301	Cementing Materials
OPSS 1302	Water
OPSS 1315	White Pigmented Curing Compounds for Concrete
OPSS 1350	Material Specification for Concrete - Materials and Production

MTO Standard Special Provisions:

SSP 109S18	Amendment to OPSS 904, November 2019 - Use of Ethylene Vinyl Acetate (EVA) Foam

Construction Administration and Inspection Specifications (CAIS):

CAIS 501	Compacting
CAIS 905	Concrete Reinforcement
CAIS 908	Metal Traffic Barriers and Metal Railings for Structures
CAIS 919	Formwork and Falsework
CAIS 920	Deck Joint Assemblies, Waterstops, Joint Fillers, Joint Seals and Joint Sealing Compounds - Structures
CAIS 928	Structure Rehabilitation - Concrete Removal
CAIS 929	Abrasive Blast Cleaning - Concrete Construction
CAIS 930	Structure Rehabilitation - Concrete Patches and Overlays

CAIS 932 Crack Repair - Concrete
CAIS 1002 Aggregates - Concrete
CAIS 1202 Bearings - Elastomeric Plain and Steel Laminated
CAIS 1301 Cementing Materials
CAIS 1302 Water
CAIS 1315 White Pigmented Curing Compounds for Concrete
CAIS 1350 Material Specification for Concrete - Materials and Production

MTO Forms:

PH-CC-702 Notice to Proceed
PH-CC-737 Request to Place Structural Concrete

904.03 DEFINITIONS

For the purpose of this CAIS, the definitions shall be as specified in OPSS 904.

904.04 DESIGN AND SUBMISSION REQUIREMENTS

904.04.01 Submission Requirements

904.04.01.01 Notification of Placement of Structural Concrete

Administrative Activities:

1	M	Check that the PH-CC-737, Request to Place Structural Concrete are received, prior to each placing operation and that it is signed by the Contractor.	-
2	M	Sign and date the “Request to Place Structural Concrete” form.	-
3	M	Issue a PH-CC-702, Notice to Proceed form to the Contractor.	-

904.04.01.02 Bridge Deck Placement Plan

Inspection Activities:

1	-	During site visits, check the work against the Bridge Deck Placement Plan.	100%

Administrative Activities:

1	M SSI	Receive and Check the “Bridge Deck Placement Plan”, if applicable, a minimum of 7 Days prior to the commencement of placing concrete in bridge decks. Check that the work plan is as specified in the Contract Documents.	-
2	M	Send the “Bridge Deck Placement Plan” with comments to the MTO CSA within 2 days of receipt.	-

3	-	If no pour sequence is provided in the contract, the contractor must submit their pour sequence, for which their formwork / falsework / girder bracing was designed.	-
4	-	If screed rails are proposed outside of the centreline of girder webs, seek MTO Regional Structural section approval.	-
5	-	Share Bridge Deck Placement Plan with inspectors and ensure it is kept on site for enforcement.	-

904.04.01.03 Temperature Control Plans

Administrative Activities:

1	M	Receive a temperature control plan a minimum of 7 Days prior to commencement of placing for a) any concrete subject to cold weather, b) high performance concrete, c) bridge decks, barrier wall, parapet wall, approach slabs and culverts and d) large concrete components where the smallest dimension is equal to or greater than 1.0 m.	-
2	M	Check that the temperature control plan complies with the Contract Documents and OPSS 904.	-

904.04.01.04 Curing Compound

Administrative Activities:

1	M	Receive and review the curing compound submission a minimum of 7 Days prior to the application of the curing compound as specified.	-

904.04.01.05 Approach Slab Seat Elastomers and Ballast Wall Elastomers

Administrative Activities:

1	M	Receive and Check a copy of the manufacturer’s certificate verifying compliance with OPSS 1202, prior to installation of the approach slab seat elastomer or ballast wall elastomer or both.	-

904.04.01.06 Tremie Concrete Placement Plan

1	M	Receive a tremie concrete placement plan a minimum of 14 Days prior to the commencement of placing tremie concrete.	-
		Check that the tremie concrete placement plan complies with the Contract Documents and OPSS 904.	

904.05 MATERIALS

904.05.01 Concrete

Administrative Activities:

1	-	Check that concrete material is as specified in OPSS 1350.	-

904.05.02 Portland Cement

Administrative Activities:

1	-	Check that Portland cement material is as specified in OPSS 1301.	-

904.05.03 Sand

Administrative Activities:

1	-	Check that sand material is as specified in OPSS 1002.	-

904.05.04 Bonding Agents

Inspection Activities:

1	-	Check that the bonding agent is as specified in OPSS 904.	25%

904.05.05 Mortar

Inspection Activities:

1	-	Check that mortar is as specified in OPSS 904.	25%

904.05.06 Burlap

Inspection Activities:

1	-	Check that the burlap is as specified in the Contract Documents.	25%

904.05.07 Water

Inspection Activities:

1	-	Check that the water is as specified in the Contract Documents and OPSS 1302.	25%

904.05.08 Moisture Vapour Barrier

Inspection Activities:

1	-	Check that the material is as specified in the Contract Documents.	25%

904.05.09 Curing Compound

Inspection Activities:

1	-	Check that the curing compound is as specified in OPSS 1315.	25%

904.05.10 Approach Slab Seat Elastomers and Ballast Wall Elastomers

Inspection Activities:

1	-	Check that the elastomers delivered to the site exceed the required length to allow for a 600 mm test sample to be taken from the approach slab seat or ballast wall elastomers on each structure.	100%
2	-	Check that the elastomer is according to the plain bearing requirements of OPSS 1202.	100%

904.05.11 Insulation Material

Inspection Activities:

1	-	Check that the insulation material is as specified in OPSS 904.	25%

904.05.12 EVA Foam

Inspection Activities:

1	-	Check that the EVA foam is as specified in SSP 109S18.	25%

904.06 EQUIPMENT

Inspection Activities:

1	-	Check that equipment made of aluminium material does not come in contact with the plastic concrete.	50%
2		Check that bridge deck finishing machine, screed rails and work bridges are as specified in the Contract Documents. If the screed rails are not located over the webs of the girders, alert MTO Contract Service Administrator, Quality Assurance and Structural Section immediately.	100%

3		Check that the compressor for air blasting is as specified in contract documents and OPSS 904.06.03.	50%
4	-	Check that the concrete pump is as specified in OPSS 904.06.04	100%
5		Check that the internal vibrators are as specified in OPSS 904.06.05	100%
6		Check that the fog misting equipment is as specified in 904.06.06.	
8	-	Check that the mixer for the bonding agent is a stationary mixer, power driven, and capable of uniformly mixing the materials.	50%
9	-	Check that the curing compound is applied to the concrete surface by means of motorized spraying equipment approved by the manufacturer of the curing compound.	50%
10	-	Check that the equipment includes a mechanical agitator.	50%
11		Check that straight edges are as specified in the Contract Documents	50%
12		Check the temperature monitoring and recording system meets the requirements of OPSS 904.06.12	100%
13		Check that the tremie is equipped with a foot valve at the bottom of the pipe. Check that the pipe is as specified in the Contract Documents.	100%

904.07 CONSTRUCTION

904.07.01 Formwork and Falsework

Inspection Activities:

1	-	Check that the formwork and falsework are as specified in CAIS 919 and the Contract Documents.	100%
2	SSI	Spot check the construction to ensure it is constructed in accordance with the Contract Documents prior to use.	25%
3	-	Prior to use, Check that the Contractor's Engineer inspects the formwork and falsework and receive the Contractor's Certificate of Conformance.	-
3	SSI	Ensure the assumed pour sequence and design loads are indicated on the formwork and falsework drawings and check against the Contractor's proposed pour operations in the Bridge Deck Placement Plan.	100%

904.07.02 Steel Reinforcement, Mechanical Connectors, and Associated Hardware

Inspection Activities:

1	-	Check that steel reinforcement, mechanical connectors, and associated hardware are as specified in OPSS 905 and the Contract Documents.	100%

2	-	Verify that where the superstructure is continuous over a support, all the deck steel reinforcement is placed in the entire deck prior to any concrete being placed.	100%

904.07.03 Deck Joint Assemblies and Joint Material

Inspection Activities:

1	-	Check that deck joint assemblies, joint fillers, joint seals, joint sealing compounds, and external waterstops are as specified in OPSS 920.	100%

904.07.04 Preparation for Concrete Placement

Inspection Activities:

1	-	Check that all concrete surfaces against which new concrete is to be placed, including formed and sawcut surfaces, are clean, solid, and free from loose or foreign substances.	100%
2	-	Check that the concrete surface is uniformly roughened to a surface profile of 5 ± 2 mm by means of methods such as scabbling, chipping, or bush hammering to expose the aggregates across the entire surface.	100%
3	-	Verify that abrasive blast cleaning is done as per OPSS 904 and OPSS 929.	100%
4	-	Check that all dust and loose material are removed from the prepared surface by using compressed air prior to wetting the concrete surface.	100%
5	-	Check that all concrete surfaces to receive concrete are maintained in a wet condition for a period of a minimum one hour prior to placing any new concrete.	100%
7	-	Check that excess water is removed from the surface using compressed air prior to placing concrete.	100%
8	-	Check that bonding agent is applied as specified in OPSS 904.07.04.05.	100%
9	-	Check that a thin uniform coating of bonding agent is brushed onto the prepared surface immediately prior to placing fresh concrete. Check that any bonding agent that is not used within 30 minutes of mixing is discarded and that bonding agent that has dried is removed and replaced prior to placing concrete against it.	100%
10	-	Check that concrete in footings is as specified in 904.07.04.06.	100%
11		Check that concrete in parapet and barrier walls and curb on structures is as specified in 904.07.04.07	100%
12		Check that concrete in approach slabs is as specified in 904.07.04.08.	100%
13		Check that concrete in slope paving is as specified in 904.07.04.09.	100%

14	-	Visually, spot check contractor's haunch heights, and screed equipment set up, to verify that proper cover and deck thickness will be achieved.	25%

Administration Activities:

1	-	Review details of "pre-placement" meeting regularly for compliance.	-
2	-	Check if wind / humidity conditions require protection against drying concrete during placement.	-
3	-	For bridge deck concrete placement, Check that the Contractor's screed elevation and haunch height calculations with MTO Structural / Structural designer's input. Check that the actual top of girder elevations are used.	-

904.07.05 Placing of Concrete

904.07.05.01 General

Inspection Activities:

1	-	Check that the concrete is not segregated.	100%
2	-	Check that the concrete placing and transporting devices are not supported by the steel reinforcement.	100%
3	-	Check that concrete is deposited within 1.5 m of its final position. When concrete is to be dropped more than 1.5 m, check that fully enclosed vertical drop chutes extending to the point of deposit are used.	100%
4	-	Check that the surface of the concrete is covered with wet burlap when there is an interruption in placing concrete greater than 20 minutes.	100%
5		Check that any interruption in concrete placement does not exceed 40 minutes.	100%
6	-	Check that the concrete and concrete testing is in accordance with OPSS 1350.	100%
7	-	Check that the placing of concrete is as specified in the Contract Documents.	100%
8	-	If concrete drying is a possibility due to wind / humidity conditions, verify that continuous fog misting is provided.	

Administration Activities:

1	-	Receive the submitted remedial action proposal submitted by Contractor for interruptions exceeding 40 minutes or cold joints for acceptance by the Owner.	

904.07.05.02 Concrete Placing Restrictions

Inspection Activities:

1	-	Check that curing materials and, in cold weather, all protection materials have been delivered to the site before any concrete is placed.	100%
2	-	Check that the temperature of formwork, steel reinforcement, or any other material on which the concrete is to be placed does not exceed 30 °C.	100%
3	-	Check that excavations prepared for concreting and any existing concrete, steel reinforcement, structural steel, forms, or other surfaces against which concrete shall be placed are at a minimum temperature of 5 °C for a period of 12 hours prior to commencement of placing concrete.	100%
4	-	Check that ice and snow are removed from the area where concrete is to be placed and concrete is not placed on or against frozen ground. Check that deicing chemicals are not used.	100%
5	-	At the start of the operation, Check that barrier and parapet walls on structures are not slipformed.	100%
6	-	When concrete is to be placed on a surface that has a slope greater than 3%, check that the placing operation begins at the lower end of the slope and progress upwards.	100%
7	-	Check that the dimensions and reinforcement of the component are in accordance with the Contract Documents.	100%

Administration Activities:

1	M	Receive and Check the Contractor's submission required under GC 7.02.07 regarding the certification by an Ontario Land Surveyor or Engineer for grade and layout of the component. For bridges, retaining walls, culverts with span of 5m or more, tunnels and sewers of 2m diameter or more, this activity is to be completed at several milestones including prior to placing new concrete footings, new concrete substructure components, on new concrete bridge seats prior to girder erection, after girder erection and prior to any work on the concrete deck, and prior to concrete deck placement for final screed rail elevations.	-
2	M	Issue a PH-CC-702, Notice to Proceed, in a timely manner, and prior to the placement of concrete if the requirements of the Contract Documents are met.	-

904.07.05.03 Concrete in Structure and in Bridge Deck

Inspection Activities:

1	M	Check that the deck finishing dry run is conducted as specified in OPSS 904.07.05.03 and cover to reinforcing steel is acceptable	100%
2	-	Check that all bridge deck placements meet the requirements in the Contract Documents.	100%
3	-	Check transferring systems (concrete pumps, belts, runways, etc.).	50%
4	SSI	Check that the Contractor is following the approved pour sequence. The pour sequence shall be provided by the Contractor if there is none in the Contract as specified in OPSS 904.04.01.02 a).	50%
5	SSI	Check that the loads (from equipment, etc.) from the Contractor's operations match those allowed on the working drawings for the falsework and formwork, and noted in the Bridge Deck Placement Plan.	50%

Administration Activities:

1	-	If the deck placement is narrower than 3 m, Receive and Check the Contractor's submitted proposal for finishing.	-

904.07.05.04 Tremie Concrete

Inspection Activities:

1	-	Check that erosion and sediment control schemes are in place and functioning prior to placement of tremie concrete.	100%
2	-	Check that unwatering is not carried out within the timeframes specified in the Contract Documents.	100%
3	M	Check that unwatering is not causing erosion of soil at the outlet or other environmental concerns (e.g. muddy water discharge). Check that the Contractor has standby equipment (pumps, hoses, filter bags, etc.) on site as required in the environmental submission. Check that the Contractor has obtained a Permit to Take Water in accordance with Special Provision 100S59 before unwatering is carried out.	100%
4	-	Check that tremie concrete is placed as specified in the Contract Documents. Check that the proper hydrostatic head is achieved prior to starting placement of tremie concrete (water should be still without evidence of flow). Check that the end of discharge hose is maintained 300 to 400 mm below the concrete surface as placement progresses. Check that the concrete is not mixing with water. Check that displaced water is pumped out at the same rate as concrete placement. Perform top of concrete elevation checks in conjunction with Contractor as placement progresses.	100%
5	-	Check elevation at which the placement is terminated.	100%

6	M	Check proper removals, cleaning and soundness of top surface prior to placing additional concrete.	100%
7	-	Check that the formed enclosure meets water tightness specified in the Contractor's submission, when placement is required next to a watercourse.	100%

904.07.06 Consolidation

Inspection Activities:

1	-	Check that vibratory equipment is in good operating condition and meets the specification requirements in the Contract Documents.	100%
2	-	Check that vibrators are used to thoroughly consolidate concrete at the point of deposit within 15 minutes of placement.	100%
3	-	Check for adequate consolidation and proper use of vibrators, Check that the concrete is not over vibrated (i.e., not be used to make the concrete flow or to spread the concrete more than 1.5 m).	100%

904.07.07 Concrete Finishing

Inspection Activities:

1	-	Check that finishing of plastic concrete is as specified in the Contract Documents.	100%
2	-	Check that finished concrete is within the tolerances specified in the Contract Documents.	100%
3	-	Check that concrete surfaces against which new concrete is to be placed have a rough surface finish.	100%
4	-	Check if newly placed concrete is exposed to precipitation or runoff during placement, consolidation or finishing.	100%

Administrative Activities:

1	-	Receive a written proposal for remedial action within 3 business Days of identifying newly placed concrete exposed to precipitation or runoff during consolidation or finishing for acceptance by the Owner.	100%

904.07.08 Curing

Inspection Activities:

1	-	Check that curing is as specified in OPSS 904.	100%

2		Check that curing is applied immediately after finishing the concrete surface. For continuing operations, such as barrier wall or sidewalk, check that curing is applied within 2 to 4 m of the finishing operation. For bridge decks, check that curing is within 2 to 4 m of the pan or screed of the finishing machine.	100%
2	-	Check that components of structures are cured with burlap and water, except as specified in the Curing Formed Surfaces clause, Including when the ambient air temperature is below 0 °C at the time of placing, except for HPC.	100%
4	-	Check that any concrete containing silica fume is cured according to the HPC curing requirements.	100%
5	-	Verify that the curing period is a minimum of 7 Days for concrete subject to cold weather, concrete cured with curing compound, and HPC. Verify that for all other concrete, the curing period is a minimum of 4 Days.	100%
6	-	Check that where waterproofing is to be applied to a structure following curing with burlap and water or moisture vapour barrier, that the deck is air cured for at least 72 hours prior to the application of waterproofing.	100%
7	-	Check that for curing with burlap and water, the burlap is pre-soaked by immersing it in water for a period of at least 24 hours immediately prior to placing.	100%
8	-	Check that two layers of burlap are applied to the surface of the concrete. Verify that burlap strips overlap 150 mm and are held in place without marring the surface of the concrete.	100%
9	-	Check that the burlap is maintained in a continuously wet condition throughout the curing period by means of a soaker hose.	100%
10	-	Check that the burlap is covered with a layer of moisture vapour barrier within 12 hours of placing of the concrete in a manner that prevents deformation of the surface of the concrete.	100%
11	-	Check that water is not allowed to drip, flow, or puddle on the concrete surface when placing the burlap or at any time prior to the concrete achieving final set.	100%
12	-	For HPC, check that fog mist is applied continuously from the time concrete is deposited in the deck, approach slab, median, curb or sidewalk, until it is covered with burlap.	100%
	-	Check that the burlap has no tears or holes.	100%
	-	Check HPC is cured with burlap and water regardless of ambient temperature.	100%
	-	Check that burlap is prevented from freezing during cold weather.	100%
13	-	Verify that curing compound is sampled at the site from the spray equipment nozzle during application.	100%

Administration Activities:

1	-	Sampling of curing compound shall be carried out as specified in clause 904.07.08.05.02. Samples must be placed in a single plastic bag with the MTO form PH-CC-340, Field Sample Data Sheet-Concrete, and fitted with a security tag. The bag should then be transported to the designated laboratory with a transmittal form.	-

904.07.09 Control of Temperature and Temperature Difference

Inspection Activities:

1	-	Check that During the curing period, the concrete temperature does not fall below 10 °C or exceed 70 °C.	100%
2	-	Check that the temperature difference is as specified.	100%
3	-	Check that control of temperature and temperature difference requirements are carried out as specified in the Contract Documents, where applicable.	100%
4	-	Check that the thermocouples for temperature and temperature difference control are installed in accordance with the Contractor's plan.	100%
5	-	Verify the accuracy of temperature monitoring systems.	75%
6	-	Check that recording of concrete temperatures begins at the start of placement. Check that the temperature is recorded automatically at intervals no greater than one hour until the end of the monitoring period.	75%
7	-	Check that the Contractor physically monitors and verifies concrete and ambient air temperature readings every six hours, or more frequently, for the first 3 Days and every 12 hours for the remainder of the monitoring period.	100%
8	-	Take random readings once per day during the curing period of the thermocouples installed in bridge deck and substructure and compare to the datalogger temperature records submitted by the Contractor, to verify thermocouple function and readings.	100%
9	-	Check that concrete subject to cold weather is placed as specified in OPSS 904.	100%
10		Check that protection plan is implemented for concrete subject to cold weather.	100%
11	-	Check that heating equipment of sufficient capacity is used throughout the curing period and for such time thereafter, as is necessary, for the completion of the work, to establish and maintain the specified curing conditions.	50%
12	-	Check that the heating equipment used within the housing is vented outside the housing. Check that heating equipment having an open flame shall not be permitted.	50%

13		Verify the installation of at least two additional temperature sensors within the protective housing. Additional sensors may be requested via the MTO Quality Assurance section when required.	
14	-	Verify that the ambient air temperature adjacent to the concrete or formwork within the housing does not vary by more than 8 °C.	100%
15	-	Check that for concrete subject to cold weather, HPC, all bridge decks, barrier wall, parapet wall, approach slab and culverts and for large concrete components where the smallest dimension is 1.0 m, the protection is gradually removed or reduced as specified in OPSS 904.	100%
16	-	Check that the protection is not totally removed or that the concrete is not fully exposed to the air until the average concrete temperature is within 10 °C of the ambient air temperature.	100%

Administration Activities:

1	-	Check that the datalogger temperature records and records of any action taken to maintain control of temperature and temperature difference are submitted at the end of each Day during the temperature monitoring period.	-
2	-	Check that at the end of the temperature monitoring period complete temperature records are submitted including graphical plot of temperature versus time.	-
3	-	Verify that for concrete subject to cold weather, the protection system is designed for the worst conditions that can be reasonably anticipated from local weather records, forecasts, site conditions, and past experience for the time period during which the protection is required.	-

904.07.10 Removal of Formwork and Falsework

Inspection Activities:

1	M	Check that the removal of formwork and falsework is according to OPSS 919 and as specified in the Contract Documents.	50%

904.07.11 Construction Joints

Inspection Activities:

1	M	Check that all construction joints are as specified in the Contract Documents.	100%
2	M	Check that any other construction joints that are not specified the Contract Documents, that are proposed by the Contractor, are approved by the Designer and/or Structural Section.	100%

904.07.12 Dimensional Tolerances

Inspection Activities:

1	M	Check that all dimensional tolerances are as specified 904.07.12.	100%

904.07.13 Surface Finish

Inspection Activities:

1	-	Verify that concrete surface is not treated with cement slurry or paste.	100%
2	-	Check that all holes left in the concrete surface with any dimension greater than 15 mm and less than 40 mm are filled with mortar or a proprietary patching material within 3 Days following the removal of forms or curing materials.	100%
3	-	Check that the holes are moist at the time of filling and mortar is tamped into place. Check that the proprietary patching materials are placed according to the manufacturer's instructions.	100%
4	-	Check that the appearance of the concrete is uniform in colour, pattern, and texture when viewed from a distance of 15 m. Check that all projections, such as fins and bulges, and all blemishes, such as stains and rust marks are removed.	100%
5	-	Check that formed and unformed surfaces are such that when tested with a 3 m long straight edge placed anywhere in any direction on the surface, there is no gap greater than 6 mm between the bottom of the straight edge and the surface of the concrete.	100%
6	-	Check that the gap between the straight edge and the surface of the concrete is not greater than 3 mm when the straight edge is placed across a construction joint.	100%
7	-	Check that all unformed construction joint surfaces against which sidewalks, curbs, medians, and barrier walls are to be placed are such that when tested with a 500 mm straight edge placed anywhere in any direction on the surface, there is no gap greater than 20 mm between the bottom of the straight edge and the surface of the concrete.	100%
8	-	Check whether the concrete has been contaminated by oil or other deleterious substances. Identify and address any contamination as a deficiency.	100%
9	-	Check that contaminated concrete in bridge decks or against which new concrete is to be placed is removed according to OPSS 928, procedure for Concrete Removal-Partial Depth, Type A, B, and C.	100%

Administration Activities:

1	-	Verify that surfaces with cavities with any dimension greater than 50 mm or with honeycombing are repaired. Receive and review the repair proposal with Quality Assurance Section and approve or reject.	-

904.07.13 Alignments of Components

Inspection Activities:

1	M	Request and receive verification from Contractor to ensure all concrete items or structural components are constructed to the specified geometry as per OPSS 904. Check that variations from plumb or a specified slope do not exceed 1H:400V and the departure from specified alignment do not exceed ± 25 mm.	100%

904.07.14 Testing for Early Strength

Inspection Activities:

1	-	Check that testing for early strength is as specified in OPSS 904 or as agreed to with the Contractor and MTO.	100%
2	-	Check that all aspects of the preparation, storing, and transportation of cylinders for early strength determination are completed as specified in OPSS 904.	100%
3	-	Check that cylinders for early strength determination are stored in or on the structure as near as possible to the component that they represent.	100%

904.07.15 Early Loading of Structural Concrete

Inspection Activities:

1	-	When early loading of a structural component is permitted, check that full curing is maintained at all times as specified in the Contract Documents.	100%
2	-	Check that the subsequent placement of reinforcement, formwork and falsework on a footing, culvert base slab, or caisson is as specified.	100%
3	-	Check that construction vehicles are not permitted on bridge decks until the requirements are met as specified in OPSS 904.07.15.	50%

Administration Activities:

1	M	Check that the 28-Day compressive strength has been attained prior to applying full design loads to the structure.	-

2	-	Check that prior to any early loading, the Contractor demonstrates that the concrete has reached a compressive strength of 20 MPa by preparing, curing, and transporting early strength cylinders as specified in OPSS 904.	-
3	-	Check that placement of concrete on the footing, culvert base slab, or caisson shall not be carried out until the concrete has reached a compressive strength of 20 MPa.	-
4	-	Check that subsequent placement of reinforcement, formwork, falsework, and concrete on all other structural components is not carried out until the concrete has reached a compressive strength of 20 MPa.	-
5	-	Verify that concrete is not subjected to early loading where cold weather protection is required.	-

904.07.16 Cracks in Concrete Surfaces

Inspection Activities:

1	-	Check that cracks are identified and documented by the Contractor according to OPSS 904. Check the cracks identified by the Contractor for accuracy on the concrete element.	100%

Administration Activities:

1	M	Check that a proposal for remedial action is submitted by the Contractor according to OPSS 904 for review and acceptance by Structural and Quality Assurance sections.	-
2	M	Accept components with formed and unformed surfaces based on verification that the cracks in the completed work were treated as required by the specification.	-
3	M	Give or deny permission to waterproof following completion of a bridge deck repair based on verification that the repair has been completed satisfactorily and the deck has air cured for 72 hours.	-

904.07.17 Concrete Cover

Inspection Activities:

1	M	Within 3 Business Days of notification by Contractor, carry out the covermeter survey on the top surface of decks (including medians and sidewalks) and front face of concrete barrier/parapet walls.	100%

Administration Activities:

1	M	Submit the results of the covermeter survey to the Quality Assurance Section electronically immediately after completion of the survey.	-

2	M	Provide the covermeter survey report to the Contractor.	-
3	M	Receive and review the proposal for remedial action for concrete cover not meeting the requirements of the Contract Documents.	-
4	M	Give or deny permission to waterproof based on acceptable concrete cover and acceptable remedial action, if applicable. Check that the deck air cured for 72 hours prior to waterproofing.	-

904.07.18 Management of Excess Material

Inspection Activities:

1	-	Check that management of excess material is done according to the Contract Documents (i.e., wash water and excess concrete to be returned to plant.).	100%

904.08 QUALITY ASSURANCE

Inspection Activities:

1	M	Accept components based on OPSS 1350 and satisfactory completion of all remedial action associated with surface tolerance, surface finish, concrete cover, alignment, cracks, and any other deficiencies.	100%
2	M	Select a random sample of the approach slab seat and ballast wall elastomers, 600 mm in length each, from each structure for testing.	100%
3	-	• Obtain and submit the MTO Structural Final Clearance/Restriction measurements. • Vertical Clearances - Gathering minimum clearance measurements along each edge of lane, in metres to 2 decimal places. • Horizontal Clearances - Clearance to be measured at right angles to the centre line of the travelled portion of the highway or edge of lane. • Check that adequate clearance or signage prior to opening to traffic.	100%

Administration Activities:

1	M	Review the test results for approach slab seat and ballast wall elastomers and determine if they meet the acceptance requirements in the Contract Documents.	-
2	M	Receive and review the test results for relative density, non-volatile content, and settlement of curing compounds. Forward the test results to the Contractor as they become available.	-

904.09 MEASUREMENT FOR PAYMENT

Administrative Activities:

1	-	Measurement for payment shall be as specified.	-

904.10 BASIS OF PAYMENT

Administrative Activities:

1	-	Basis of payment shall be as specified.	-

WARRANT: Always with OPSS 904, Construction Specification for Concrete Structures.