

Administration and Inspection Activities for Concrete - Materials and Production

(As Specified in OPSS 1350)

1350.01 SCOPE

This inspection specification covers the construction administration and inspection requirements for concrete materials and production as specified in OPSS 1350, November 2024.

1350.02 REFERENCES

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

Ontario Provincial Standard Specifications, Material:

- OPSS 1002 Aggregates - Concrete
- OPSS 1301 Cementing Materials
- OPSS 1302 Water
- OPSS 1303 Admixtures for Concrete
- OPSS 1350 Concrete - Materials and Production.

Construction Administration and Inspection Specifications (CAIS):

- CAIS 904 Concrete Structures
- CAIS 1002 Aggregates - Concrete
- CAIS 1302 Water
- CAIS 1303 Admixtures for Concrete

MTO Forms:

- PH-CC-322 Concrete Construction Report
- PH-CC-340 Field Sample Data Sheet - Concrete
- PH-CC-433- A Concrete Mix Design Submission Form A
- PH-CC-433-B Concrete Mix Design Submission Form B
- PH-CC-434 Sample Letter to Contractor - Concrete Mix Design
- PH-CC-885 Concrete Referee Testing Request

1350.03 DEFINITIONS

For the purpose of this CAIS, the definitions shall be as specified in OPSS 1350.

1350.04**DESIGN AND SUBMISSION REQUIREMENTS****1350.04.01****Design Requirements**

Administrative Activities:

1	-	Check that all concrete mixes are designed as specified in the Contract Documents.	-
2	-	Check that Type A or D water reducer according to OPSS 1303 is used for all concrete, except in applications where plant addition of superplasticizer is permitted, in which case water reducer may be used at the Contractor's option.	-
3	-	Check that accelerators are only used when specified in the Contract Documents.	-
4	-	Check that superplasticizers are used in concrete containing silica fume and concrete in expansion joint end dams as specified in the Contract Documents. If superplasticizers are used in other concrete, and verify that it does not cause segregation or inadequate consolidation.	-

1350.04.02**Submission Requirements****1350.04.02.01****Mix Design****1350.04.02.01.01****General**

Administrative Activities:

1	M	Receive the concrete mix design submission from the Contractor.	-
2		<u>Receive from the Contractor the Form A portion of all concrete mix designs, Owner standard form PH-CC-433-A, along with any supporting documentation required as specified.</u>	-
3		<u>Check that all Form A submissions comply with OPSS 1350.04.02.01.03.</u>	-
4		<u>Monitor the Contractor's schedule for compliance related to the mix design submission timelines as specified to check the Form A is submitted as specified.</u>	-
5		<u>Check the materials included in the Form A's (such as cement, supplementary cementing materials and admixtures) are from the Ministry's Designated Sources for Materials (DSM) or other Ministry approved lists.</u>	-
6		<u>Verify that the aggregate sources are listed on the Concrete Aggregate Source List (CASL). If they are not on the CASL confirm additional testing requirements.</u>	-
7	M	<u>Verify that the mix designs, Owner standard form PH-CC-433-A and PH-CC-433-B, are submitted, prior to concrete placement, to the Head of Quality Assurance and MTO Concrete Section.</u>	-

<u>82</u>	M	Review the mix design submission and provide written confirmation using Owner standard form PH-CC-434 if Form A and the mix design supporting information meet the requirements as specified in the Contract Documents and OPSS 1350.04.02.01.01 and submit a copy to the MTO Quality Assurance Section.	-
<u>39</u>	-	Check that Type A or D water reducer according to OPSS 1303 is used for all concrete, except in applications where plant addition of superplasticizer is permitted, in which case water reducer may be used at the Contractor's option.	-
<u>410</u>	-	Check that accelerators are only used when specified in the Contract Documents.	-
<u>511</u>	-	Check that superplasticizers are used in concrete containing silica fume and concrete in expansion joint end dams as specified in the Contract Documents. If superplasticizers are used in other concrete, check that it does not cause segregation or inadequate consolidation.	-

1350.04.02.01.02 Changes to Mix Design Submission

Administrative Activities:

1	M	If changes are made to the mix design, identify when a new mix design is required according to OPSS 1350.04.02.01.02. Receive and Check the supporting documentation when required.	-
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1350.04.02.01.03 Submission of Form A

Administrative Activities:-

1	-	Receive from the Contractor the Form A portion of all concrete mix designs, Owner standard form PH-CC-433-A, along with any supporting documentation required as specified.	-
2	-	Check that all Form A submissions comply with OPSS 1350.04.02.01.03.	-
3	-	Monitor the Contractor's schedule for compliance related to the mix design submission timelines as specified to check the Form A is submitted at least 7 Business Days prior to the placement of concrete.	-
4	-	Check the materials included in the Form A's (such as cement, supplementary cementing materials and admixtures) are from the Ministry's Designated Sources for Materials (DSM) or other Ministry approved lists.	-
5	-	Verify that the aggregate sources are listed on the Concrete Aggregate Source List (CASL). If they are not on the CASL confirm additional testing requirements.	-

1350.04.02.01.04 Submission of Form B

Administrative Activities:

1	M	Verify that the mix designs, Owner standard form PH-CC-433-A and PH-CC-433-B, are submitted, prior to concrete placement, to the Head of Quality Assurance and MTO Concrete Section.	-
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1350.04.02.01.05 Mix Design Supporting Documentation

Administrative Activities:

1	M	Check that all applicable supporting documents from OPSS 1350.04.02.01.05 are submitted and verify if there are any other supporting documents elsewhere in the Contract (as stated in point f).	-
2	M	Issue the Letter to Contractor, Owner standard form PH-CC-434, within 4 Business Days of receipt of the complete submission.	-

1350.04.02.02 Certification of Ready Mixed Concrete Production

Administrative Activities:

1	M	Check that the Contractor submits the concrete plant's RMCAO certification as specified, prior to production.	-
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1350.05 MATERIALS

1350.05.01 Cementing Materials

Administrative Activities:

1	M	Check that the cementing materials are on DSM 9.25.40 - Hydraulic Cements and Supplementary Cementing Materials, and according to OPSS 1301.	-
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1350.05.02 Aggregates

1350.05.02.01 General

Administrative Activities:

1	M	Check that aggregates are as specified in OPSS 1002.	-
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1350.05.02.01 Limestone Filler

Administrative Activities:

1	M	Check that limestone filler, if used, is as specified in OPSS 1350.05.02.01. Contact Quality Assurance to verify limestone filler material meets requirements.	-
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1350.05.03 Water

Administrative Activities:

1	M	As specified in CAIS 1302.	-
2	M	<u>Verify that the water used in the work is approved by the Ministry of the Environment, Conservation and Parks.</u> Verify that the water used in the work is approved by the Ministry of Health.	-
3	M	<u>Receive documentation for potable water from non municipal source that the water is according to OPSS 1302.05.01.02.</u> <u>For water not approved by the Ministry of Health, receive the certificate from an independent test laboratory for water stating that the water is according to OPSS 1302.04.</u>	-
4	M	<u>Receive documentation for non potable water that the water is according to OPSS 1302.05.01.03.</u>	

1350.05.04 Admixtures

Administrative Activities:

1	M	As specified in CAIS 1303.	-
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1350.05.05 Concrete

Administrative Activities:

1	M	Check that the concrete mix designs meet the greenhouse gas (GHG) reduction requirements.	-
2	M	If the Contractor propose the use of Self-Consolidating Concrete, Proprietary Patching Materials, Grouts, or other concrete materials, receive the proposal from the Contractor and contact the MTO Quality Assurance Section.	-
3	M	Check that the quality assurance samples of aggregates are taken as specified in OPSS 1002 and are delivered to the appropriate laboratories.	-
4	M	Check that the plastic concrete meets the requirements as specified in OPSS 1350.05.045.032 including material tickets and daily summaries.	-

5	M	Check that the hardened concrete meets the requirements as specified in OPSS 1350.05.045.023.	-
6	M	Check that all materials are listed on the DSM list or other Ministry approved lists at the time of the work.	-

1350.06 EQUIPMENT

Inspection Activities:

1	-	During the production of concrete, Check that the delivery equipment is as specified in OPSS 1350.06.02.	100%
2	M	For concrete base or concrete pavement operations, Check that non-agitating trucks, if used, are as specified in OPSS 1350.06.02.	100%
3	M	Verify that truck mixers delivering concrete to the work are certified by the RMCAO and display valid certification stickers.	100%
4	-	If a truck does not have a sticker or the sticker is not valid for the date of concrete placement, Notify the Contractor that the concrete from the truck cannot be placed in the work.	100%

1350.07 PRODUCTION

Inspection Activities:

1	M	Witness sampling of cementing materials, limestone filler (if applicable), admixtures and water (when other than municipal drinking water is used) and check that sampling is as specified in OPSS 1350.07.05.02.	100%
2	-	Check concrete delivery tickets for specified strength, mix design number and batching time, and Record (in the WB CMS Concrete diary) the discharge time, and other information as specified. Check that the specified strength and mix design number on the delivery ticket are correct and that concrete is discharged within the time specified in OPSS 1350.07.04.02.	100%
3	M	Check that field testing and sampling is conducted as specified in OPSS 1350.07.05.03.	100%
4	M	Verify that the technician performing the testing of plastic concrete is certified by American Concrete Institute (ACI), or Canadian Council of Independent Laboratories (CCIL) or CSA Standard Concrete Field Testing Technician by verifying their card, their identity and that their certification is valid on the date of concrete placement.	100%
5	M	Check that plastic concrete is sampled after 10% of the load is discharged and tested as specified.	100%
6	M	Witness the plastic concrete testing, including visual assessment, slump, air, temperature, discharge time and Record the information (including truck and delivery ticket numbers).	100%

7	-	Check that the Contractor records the amount of any material added after batching, rejection of a load or part thereof, time truck arrived on site and the time when the truck finished discharging.	100%
8	-	Witness the placement of all loads of plastic concrete supplied for cast-in-place operations.	100%
9	-	<p>Check that casting, curing and transporting of test cylinders are carried out as specified. Apply security stickers to the moulds immediately after casting cylinders.</p> <p>For initial curing, check that the cylinder moulds are placed on a rigid horizontal surface free from vibration and other disturbances and stored in a controlled environment that maintains the temperature between 15 and 25 °C immediately adjacent to the specimens.</p>	100%

Administrative Activities:

1	M	Identify which method of acceptance will be used for compressive strength For acceptance method A, determine lot and subplot sizes and generate random numbers.	-
2	M	Obtain an estimate of concrete quantity for each minimum specified 28-Day compressive strength from the Contractor to determine sampling frequency for compressive strength, air void system (AVS) and rapid chloride permeability (RCP) in respect to their appropriate lots and sublots.	-
3	M	Check that samples of cementing materials, limestone filler (if applicable), admixtures and water (when other than municipal drinking water is used) are delivered to the appropriate laboratories and that the test results meet all of the requirements of the Contract Documents. Samples of admixture and water shall be protected from freezing and high temperatures. Cementing materials and limestone filler samples shall be protected from moisture.	-
4	-	Receive the submission for "Plastic Concrete Test Results" from the Contractor after each day's work.	-
5	M	Check that the "Plastic Concrete Test Results" submission includes copies of delivery tickets for each load of concrete and a summary of testing, adjustments, and rejections, as specified.	-
6	-	Receive and Check the submission of curing records for cylinders cast.	-
7	M	Verify that the delivery ticket information for each load of concrete is entered in WBCMS to track green house gas (GHG) reduction and to verify concrete compliance and payment.	-

1350.08 **QUALITY ASSURANCE**

Inspection Activities:

1	M	Identify random locations for coring specimens for AVS and RCP and verify that the cores are taken when concrete is 7 to 10 days of age.	100%
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2	M	Upon removal of the core samples, verify that cores are properly labelled and packaged in the security bags provided by MTO.	100%
3	M	Upon removal of the core samples, immediately take possession of the cores and deliver them to the designated Area Quality Assurance laboratory for testing.	100%

Administration Activities:

1	-	Check that the admixture results are within the tolerances allowed in OPSS 1303. If the results are outside the tolerances of OPSS 1303 check Table 8 of OPSS 1350 to identify if the \$5000 payment reduction is applied.	-
2	-	Receive and Check the submissions for "Cylinder Curing Records" at the completion of the field curing period.	-
3	M	Calculate the quantity of concrete in lots using the dimensions in the Contract, for the purpose of calculating payment adjustment for performance cylinders, AVS and RCP.	-
4	-	Submit the compressive strength, AVS and RCP test results and any payment adjustment information to the Contractor as the results become available.	-
5	-	For compressive strength acceptance method A, submit the analysis of results at a minimum of monthly intervals to the Contractor.	-
6	-	For compressive strength acceptance method A, verify the theoretical quantity indicated in the Contract Documents for items paid by lump sum, provided the actual quantity is within +/-3% of the theoretical quantity.	
7	-	Check that the material selected to fill in core holes is listed on the Ministry's Concrete Proprietary Patching List, and that the specified procedure for filling of core holes is followed.	-
8	-	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 <u>5-3</u> Business Days of receiving the results of that subplot.	-
9	-	Complete Owner standard form PH-CC-885 Concrete Referee Testing Request and Submit it to the appropriate Quality Assurance Officer (QAO).	-
10	-	If the laboratory cannot complete Referee Testing in a reasonable timeframe, inform the QAO, who will provide another referee laboratory from the EMO referee roster.	-
11	-	Submit a copy of the completed Referee Request Form provided by EMO to the referee laboratory by email.	-
12	-	CA or QAO to contact the Area Quality Assurance laboratory and notify them to ship the referee samples immediately to the referee laboratory.	-
13	-	Check notification is received for samples arriving at the referee laboratory.	-

14	-	If cores are required for referee testing, coordinate the core removal and determine the element and locations for core removal and notify the Contractor.	-
15	-	Check the AVS referee process as specified in OPSS 1350.08.02.03 and verify the referee testing is carried out on the same half of the core sample that was tested for acceptance.	-
16	-	Once the schedule for referee testing has been finalized, provide the Contractor and QAO with the details of the referee laboratory, dates and times shall be a minimum of 3 Business Days in advance of the date and time of Referee Testing.	-
17	-	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.	-
18	M	Once testing is complete, Receive and Review the test results from the Referee Laboratory as specified in OPSS 1350 for: <ul style="list-style-type: none"> • Compressive Strength: 1350.08.01.04. • AVS: 1350.08.02.03. • RCP: 1350.08.03.03. • Admixture: 1350.08.04.01.03. • Water Other than Municipal Drinking Water: 1350.08.04.02.03. • Cementing Materials: 1350.08.04.03.03. 	-
19	-	Request clarification from the Referee Laboratory if required, otherwise, Submit the results to the Contractor. Also Submit the Referee results together with a cover letter to the applicable QAO.	-

WARRANT: Always with OPSS 1350, Material Specification for Concrete - Materials and Production.