

CCIL Aggregate and Soil Proficiency Sample Program
BC, SK, MB, NB, NL, NS, PE

2021 BC, MB, NB, NL, NS, SK, PE MINI-CORRELATIONS

AGGREGATES and SOILS INCLUDING SUPERPAVE AGGREGATES

Please read the following Mini-Correlation instructions carefully BEFORE you start testing!

- Testing of mini correlation samples shall be according to the below instructions.
- Submission of results by **March 31st 2021** in the mini correlation report(s) provided in the labs portal. <https://portal.ccil.com/> After signing into the portal, all mini-correlation reporting forms appropriate to your lab certification will be accessible under the tab for **Reporting Forms**. You will be able to enter your test results into the forms and submit to CCIL through the portal.
- Please record the mini-correlation sample identification information found on the sample labels in the “Comments” section of the reporting forms and send any photos of unclear labels to ewordenkwok@ccil.com

SAMPLES FOR MINI-CORRELATION TESTING

- Samples for the mini-correlation were shipped to the laboratory March 12th due to delays. The Due date has been extended to March 31st.
- The mini-correlation samples are pre-prepared to meet the requirements of the appropriate test method and are to be tested as received unless instructed otherwise.
- Generally, only one sample will be shipped for each test requiring a mini-correlation. Tests for a mini-correlation are not generally carried out in pairs.

BC, SK, MB, PE, NS, NB, NL MINI-CORRELATION INSTRUCTIONS – AGGREGATES

Sample Preparation

Dry all mini-correlation aggregate samples to a constant mass at $110 \pm 5^{\circ}\text{C}$.

ASTM C136: SIEVE ANALYSIS OF AGGREGATES,

If the problem with your original test results was with the fine aggregate sieves only, your lab will receive a mini-correlation sample of fine aggregate only. Otherwise, your lab will receive a combined coarse aggregate and fine aggregate sample.

Combined

If you receive a **combined coarse and fine aggregate sample**, test the entire mini-correlation sample as specified in C136 to determine the aggregate gradation. Report the percent passing on each sieve listed in the portal report (19, 16, 12.5, 9.5, 4.75, 2.36, 1.18, 0.6, 0.3, 0.15 and 0.075 mm). All sieves are to be reported to 1 decimal (0.1%), except the 4.75 mm and 0.075 mm sieves are to be reported to two decimal places (0.01%).

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Fine Only

If you receive **only fine aggregate** for the mini-correlation sample, test the entire mini-correlation sample following C136 on the 2.36, 1.18, 0.6, 0.3, 0.15 and 0.075 mm sieves. However, when reporting the % passing, use the value from the following table to reduce the % passing on each sieve by the factor provided. All sieves are to be reported to 1 decimal (0.1%), except the 0.075 mm sieve is to be reported to two decimal places (0.01%).

Mini sample year on label	Factor for original % passing the 4.75mm sieve
2019	0.3786
2020	0.531
2021	0.3801

Example:

Sieve (mm)	Fine Aggregate % Passing of sample	Multiplication factor (%Passing 4.75mm)	Value to be reported in the portal report (% Passing of original)
2.36	77.7	0.4908	38.1
1.18	58.2	0.4908	28.6

ASTM C117: Wash Passing 0.075 mm sieve.

Test the entire mini correlation sample as specified in C117. Report the Percent Loss to one decimal (0.01%).

ASTM D5821: PERCENTAGE OF FRACTURED PARTICLES IN COARSE AGGREGATE

The mini-correlation sample is comprised of a single test sample representing all of the size fractions combined. Sieve over the 4.75 mm sieve to remove the fines and but do not separate into sized fractions. Reduce the sample by splitting to a minimum 2000 g test sample. Test as a single fraction and report a Percent Fractured Particles on that basis. Compute the percent fractured particles of the entire sample:

$$\text{Percent Fractured particles} = (A/B) \times 100.$$

where: A = mass of fractured particles.

B = mass of test sample.

Determine the percentage of material with at least one fractured face to the nearest 0.1%

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ASTM D4791: PERCENT FLAT AND ELONGATED PARTICLES

The mini-correlation sample is comprised of a single test sample each, representing all of the size fractions combined. Do not separate into sized fractions. Test the portion of the sample retained on the 4.75mm sieve only. Perform the test in accordance with Method B of ASTM D4791. Test as a single fraction and report a Percent Flat and Elongated particles on that basis.

Perform the test using a 5:1 ratio.

Report the overall weighed average the result to the nearest 0.1%.

ASTM C127: RELATIVE DENSITY AND ABSORPTION (COARSE AGGREGATE)

Carry out the test as outlined in the test procedure. The mini-correlation sample size allows for duplicate testing. Report the Average Relative Density (OD) to three decimal places (0.001). Calculate and report the Average Percent Absorption and report to 2 decimal places (0.01%).

ASTM D6928: MICRO-DEVAL ABRASION (COARSE AGGREGATE)

Carry out the test as outlined in the test procedure. Prepare three fractions with the below mass for each fraction.

19.0 mm to 16.0 mm - 375 g

16.0 mm to 12.5 mm - 375 g

12.5 mm to 9.5 mm - 750 g

Recombine and test the 1500g sample in accordance with the test method. Report the mini-correlation test sample loss to the nearest 0.1%.

Run a control sample at the same time. Report your control sample tested (Drain Brothers or MTO RM CA2), and Loss to the nearest 0.1% in the comments section of the portal report.

ASTM C128 RELATIVE DENSITY AND ABSORPTION OF FINE AGGREGATE,

Carry out the test as outlined in the test procedure. The mini-correlation sample size allows for duplicate testing. Remove the material finer than 75µm following the procedure in C 117 prior to testing. Saturate the test specimens from both samples by immersion in water for 24 ± 4 hours. Report the Average Relative Density (OD) to three decimal places (0.001). Calculate and report the Average Percent Absorption and report to 2 decimal places (0.01%).

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ASTM D7428 MICRO-DEVAL ABRASION LOSS OF FINE AGGREGATE,

Prepare 500 g test specimens from the mini-correlation samples according to the test method and the table below.

Passing	Retained	Mass g
4.75	2.36	50
2.36	1.18	125
1.18	0.600	125
0.600	0.300	100
0.300	0.150	75
0.150	0.075	25

Report the mini-correlation sample loss to the nearest 0.1%.

Run a control sample at the same time. Report your laboratory control sample tested (Sutherland sand or James Dick) and Loss to the nearest 0.1%.

AASHTO T88 (formerly D422): PARTICLE SIZE ANALYSIS OF SOILS

Prepare the test specimens in accordance with T88. Use a freshly prepared dispersing agent with distilled water using 48 grams of sodium hexametaphosphate per litre of solution and ensure the pH value of the solution is adjusted to 8 or 9. The soil samples supplied should be dispersed in the stirring apparatus for 10 minutes.

Compute the specific gravity correction factor α and constant K using the value 2.781 (DO NOT use the values determined by your lab).

Report the percent passing the 2.0 mm, 425 μ m, 75 μ m, 20 μ m, 5 μ m and 2 μ m sieves to one decimal (0.1 %).

ASTM D4318: Liquid Limit, Plastic Limit and Plasticity Index of Soils

Determine the Liquid Limit, Plastic Limit and Plasticity Index of mini-correlation soil sample provided according to ASTM D 4318. Prepare the test specimens as outlined in Section 10.2 – Dry Preparation, and determine the Liquid Limit according to the procedure described in Section 11.0, Method A – Multi-point Liquid Limit. Determine the Plastic Limit using a minimum of two trials and report the mean value. Report the Liquid Limit, Plastic Limit and Plasticity Index to the nearest one decimal, i.e., 0.1 percent.

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ASTM D698: MOISTURE-DENSITY RELATIONSHIP

Dry the mini correlation sample to a constant mass at $110 \pm 5^\circ\text{C}$.

Perform this test on all the material passing the 4.75mm sieve from the Mini correlation sample. Prepare the sample by adding appropriate amount of water so that the plot of the first run Dry Density and Moisture Content falls below the Optimum Moisture Content.

Carry out the test using a 101.6mm diameter mould using method 'A'. Compact the sample **manually** using 25 blows per layer. Do not use an automatic hammer. Determine the Dry Density and Moisture Content from at least four trials. Plot the value of Dry Density and Moisture Content according to section 11 of the method.

Do not correct the results to compensate for oversized particles. D698 does not allow re-use of compacted material. However, for CCIL proficiency testing purposes only, you may re-use the material and add water for each succeeding trial. Should you observe excessive water run-off from the mould during compaction and/or aggregate break-down during the trials, please note it in the comments section on the reporting form.

Report the maximum wet density (MWD) in t/m^3 , corrected maximum dry density (MDD) in t/m^3 , and corrected optimum moisture content (OMC) in percentage. (Note: $\text{t/m}^3 = \text{g/cm}^3 \text{ eg } 2.222$).
