

YEAR 2019 CCIL CORRELATION

IGNITION FURNACE TEST INSTRUCTIONS

The following samples have been forwarded to your laboratory:

Material **IGCF-I-(N)** (Five samples)

Material **IGMF-I-(N) and IGMF-II-(N)** (Two pre-mixed samples)

Asphalt Cement **IGAC-I-(N)** (One sample)

A) Ignition Furnace: Reference Procedure ASTM D6307

- 1) While furnace is at room temperature calibrate the furnace balance as described in the furnace manual provided by the manufacturer.
- 2) Set the combustion temperature of 540°C (deemed appropriate for this type of sample) or as indicated for Irradiation type furnace.
- 3) Set the start time (Auto Timer) so that the furnace is at the specified run temperature (see 2) above) for at least 60 minutes before starting the burn of the first sample of the day.
- 4) Set the furnace endpoint to 0.01% of the sample mass (D6307)

B) Sample Preparation

Correction Factor (IGCF-I-(N)) Samples:

- 1) Five sample bags containing approximately 1500g of mixed aggregates and one sample of asphalt cement are supplied
- 2) Aggregates are to be dried prior to mixing.
- 3) A clean mixing bowl will be buttered by mixing a separate sample of HMA (not supplied). The bowl will be scraped clean of this buttering mix prior to mixing the five samples supplied.
- 4) Mixing temperature for the correction factor samples is 150°C.
- 5) Weigh and record the dried aggregate sample.
- 6) Based on this weight add sufficient asphalt cement (supplied) to produce a mix containing **5.00%, IGAC-I-(N)** (based on total mix).
- 7) Mix the sample as indicated in D-6926
- 8) Transfer the mixed sample to a metal tray, spread it out, cover with metal foil and allow it to cool to ambient temperature.
- 9) Sample is now ready for testing.
- 10) Five samples are provided. Calibration Factor shall be determined from 3 of the 5 samples according to D6307.

Pre-mixed IGMF-I-(N) and IGMF-II-(N) Samples:

- 1) Sample bags containing approximately 1500g of **IGMF-I-(N)** and **IGMF-II-(N)** are supplied and are ready for testing. Determination of moisture content is not required.

C) Ignition Furnace Run:

- 1) Weigh the lid, sample tray, catch pan and retaining bracket on the laboratory balance (TABLE 1 – for **IGCF-I-(N)** (Correction Factor) samples and TABLE 3 – for **IGMF-I-(N) and IGMF-II (N)** (HMA) samples)
- 2) Preheat the sample to be tested to 110°C±5°C (i.e. sufficiently warm to handle). Do not heat for more than one hour.
- 3) Place catch pan under sample tray and spread sample evenly on the tray.
- 4) Place lid over sample tray and secure lid, tray and catch pan with the retaining bracket.

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- 5) Weigh total assembly on the laboratory balance and record the mass to 0.1g (TABLE 1 for **IGCF-I-(N)** samples and TABLE 3 for **IGMF-I-(N) and IGMF-II-(N)** samples)
- 6) Calculate sample mass (C in both TABLE 1 and TABLE 3)
- 7) Enter the sample mass C in the furnace data system.
- 8) Place the assembly in the preheated furnace and close the door.
- 9) Heat the sample at the specified temperature (540°C) until the difference between consecutive mass loss measurements does not exceed requirements for three one minute intervals.
- 10) Record sample mass after ignition (from data tape) (TABLE 1 – F for **IGCF-I-(N)** samples and TABLE 3 – F for **IGMF-I-(N) and IGMF-II-(N)** samples).
- 11) Remove the assembly from the furnace and allow to cool to ambient temperature and weigh to the nearest 0.1g (TABLE 1 – E for **IGCF-I-(N)** samples and TABLE 3 – F for **IGMF-I-(N) and IGMF-II-(N)** samples).
- 12) Record required data from tapes in TABLES 1 and 3 for **IGCF-I-(N)** and **IGMF-I-(N) and IGMF-II-(N)** samples respectively.

NOTE: LABORATORIES SHOULD TAKE CAUTION REGARDING NEGATIVE CALIBRATION FACTORS. A LARGE NEGATIVE CALIBRATION FACTOR SUGGESTS THAT THE ASPHALT CEMENT HAS NOT BEEN COMPLETELY BURNED DURING THE IGNITION RUN.

D) Ignited Aggregate Gradation

- 1) Carefully transfer the total residue after ignition to a weighing pan and weigh to the nearest 0.1g.
- 2) Proceed with the washed sieve gradation. Laboratories shall complete the attached work sheets (Tables 1-4) and submit copies of the output tapes from the ignition furnace runs.

Asphalt contents shall be expressed as mass percent of total mixture.

All test results shall be reported online and submitted by **January 4 2019**.

NOTE for laboratories in British Columbia: If your laboratory does not use the 16.0mm sieve, please do not enter zero in the online reporting form. Please cancel this sieve by clicking the box adjacent to the sieve in the reporting form.

An example of a completed report form is shown on page 3.

Hard copies of the report forms and work sheets (including Tables 1-4) must be submitted by **January 4 2019** by mail or courier to:

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DO NOT send reports and worksheets by fax

YEAR 2019 CCIL CORRELATION

| 2019 CCIL CORRELATION - EXAMPLE FORM BC, MB, NB, NL, NS and SK | | | | | |
|--|--------------------------|-----------|-----------|-----------------------------|----------------|
| Testing Admin Information | | | | your assigned CCIL Lab No.: | BC99 |
| • Lab Name (include Branch or Mobile #) | Apex Construction | | | | |
| • E-mail Address | enstein@apex.xom | | | | |
| • Reported by (Contact Name) | Frank Enstein | | | | |
| • Phone Number (Contact) | (999) 999-9999 | | | | |
| • Tested by (Name(s)) | I.P. Daly | | | | |
| • Results Reporting Date | January 4 2019 | | | | |
| D6307 IGNITION FURNACE | | | | | |
| Manufacturer: | Easy Bake | Model: | 100 W | S/N: | 123321 |
| Calibration Factor Samples (IGCF-I) - (Enter only the 3 samples used) | | | | | |
| | Sample Number | x | y | z | Average |
| • %A.C. | | 5.22 | 5.15 | 5.14 | 5.17 |
| % Passing Sieve, mm | | | | | |
| • 19.0 | | 100.0 | 100.0 | 100.0 | 100.00 |
| • 16.0 BC labs only: <i>Cancel sieve?</i> <input type="checkbox"/> | | 100.0 | 100.0 | 100.0 | 100.00 |
| • 13.2 | | 97.6 | 98.4 | 98.1 | 98.03 |
| • 9.5 | | 84.7 | 85.4 | 85.1 | 85.07 |
| • 4.75 | | 63.6 | 63.4 | 63.8 | 63.60 |
| • 2.36 | | 52.1 | 52.0 | 52.4 | 52.17 |
| • 1.18 | | 43.7 | 43.5 | 43.6 | 43.60 |
| • 0.600 | | 33.7 | 33.5 | 33.7 | 33.63 |
| • 0.300 | | 20.6 | 19.9 | 20.4 | 20.30 |
| • 0.150 | | 8.3 | 8.0 | 8.2 | 8.17 |
| • 0.075 | | 3.2 | 3.1 | 3.1 | 3.13 |
| • Calibration Factor | | 0.22 | 0.15 | 0.14 | 0.17 |
| Bituminous Mix (IGMF-I and II) Samples | | | | | |
| | Sample Number | 11 | 65 | Average | |
| • %A.C. Corrected | | 5.03 | 5.12 | 5.08 | |
| % Passing Sieve, mm | | | | | |
| • 19.0 | | 100.0 | 100.0 | 100.00 | |
| • 16.0 BC labs only: <i>Cancel sieve?</i> <input type="checkbox"/> | | 100.0 | 100.0 | 100.00 | |
| • 13.2 | | 98.1 | 98.4 | 98.25 | |
| • 9.5 | | 85.1 | 85.4 | 85.25 | |
| • 4.75 | | 63.8 | 63.4 | 63.60 | |
| • 2.36 | | 52.4 | 52.0 | 52.20 | |
| • 1.18 | | 43.6 | 43.5 | 43.55 | |
| • 0.600 | | 33.7 | 33.5 | 33.60 | |
| • 0.300 | | 20.4 | 19.9 | 20.15 | |
| • 0.150 | | 8.2 | 8.0 | 8.10 | |
| • 0.075 | | 3.1 | 3.1 | 3.10 | |

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TABLE 1: In-House Prepared Calibration Factor Samples

| General Information | | | | | | |
|--|---|----------------------------|----------|----------|----------|----------|
| Company Name | | | | | | |
| Technician's Name | | | | | Date | |
| Specific Information | | | | | | |
| | | Calibration Factor Samples | | | | |
| | | Code No. | Code No. | Code No. | Code No. | Code No. |
| | | | | | | |
| Laboratory Balance | | | | | | |
| A | Mass of sample try, lid, catch pan, g | | | | | |
| B | Mass of sample tray, lid, catch pan, sample, g | | | | | |
| $C = (B - A)$ | Initial Mass of Sample, g | | | | | |
| D | Mass of sample tray, lid, catch pan, sample after ignition, g | | | | | |
| $E = (D - A)$ | Final mass of sample after ignition, g | | | | | |
| Furnace Balance | | | | | | |
| F | Final mass of sample after ignition, g (data tape) | | | | | |
| $G = (C - F)$ | Loss Furnace, g | | | | | |
| $H = (G/C) \times 100$ | Loss Furnace, % | | | | | |
| I | Loss Furnace Correction, % | | | | | |
| $J = (H - I)$ | Total Loss Furnace, % (Apparent AC) | | | | | |
| K | Total AC added, % | | | | | |
| $L = (J - K)$ | Calibration Factor, % | | | | | |
| Furnace Temperature Information | | | | | | |
| Test temperature shown on controls, °C | | | | | | |
| Initial temperature from data tape, °C | | | | | | |
| Maximum temperature form data tape, °C | | | | | | |
| Final temperature from data tape, °C | | | | | | |

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**TABLE 2: Gradation of In-House Prepared Calibration Factor Samples
(After Ignition)**

| | | Calibration Factor Samples | | | | |
|----------------------------|------------------|----------------------------|----------|----------|----------|----------|
| | | Code No. | Code No. | Code No. | Code No. | Code No. |
| | | | | | | |
| Laboratory Balance | Initial Mass, g | | | | | |
| | Final Mass, g | | | | | |
| Furnace Balance | Initial Mass, g | | | | | |
| | Final Mass, g | | | | | |
| AGGREGATE | | | | | | |
| Dry mass before washing, g | | | | | | |
| Dry mass after washing, g | | | | | | |
| GRADATION | % Passing | | | | | |
| | 16.0 mm | | | | | |
| | 13.2 mm | | | | | |
| | 9.5 mm | | | | | |
| | 4.75 mm | | | | | |
| | 2.36 mm | | | | | |
| | 1.18 mm | | | | | |
| | 600 µm | | | | | |
| | 300 µm | | | | | |
| | 150 µm | | | | | |
| 75 µm | | | | | | |

Laboratory Name: _____

Date Tested: _____

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TABLE 3: Test Results - Premixed HMA Samples

| General Information | | | | | | |
|--|---|----------------------|----------|----------|----------|----------|
| Company Name | | | | | | |
| Technician's Name | | | | Date | | |
| Specific Information | | | | | | |
| | | Prepared HMA Samples | | | | |
| | | Code No. | Code No. | Code No. | Code No. | Code No. |
| | | | | | | |
| Laboratory Balance | | | | | | |
| A | Mass of sample try, lid, catch pan, g | | | | | |
| B | Mass of sample tray, lid, catch pan, sample, g | | | | | |
| C = (B - A) | Initial Mass of Sample, g | | | | | |
| D | Mass of sample tray, lid, catch pan, sample after ignition, g | | | | | |
| E = (D - A) | Final mass of sample after ignition, g | | | | | |
| Furnace Balance | | | | | | |
| F | Final mass of sample after ignition, g (data tape) | | | | | |
| G = (C - F) | Loss Furnace, g | | | | | |
| H = (G/C) x 100 | Loss Furnace, % | | | | | |
| I | Loss Furnace Correction, % | | | | | |
| J = (H - I) | Total Loss Furnace, % (Apparent AC) | | | | | |
| CF* | Correction Factor, % | | | | | |
| L = (J - CF) | Asphalt Cement, % | | | | | |
| Furnace Temperature Information | | | | | | |
| Test temperature shown on controls, °C | | | | | | |
| Initial temperature from data tape, °C | | | | | | |
| Maximum temperature form data tape, °C | | | | | | |
| Final temperature from data tape, °C | | | | | | |

* CF = Calibration factor as derived from the testing in TABLE 1

Date Tested: _____

**TABLE 4: Gradation of Aggregates from Pre-mixed HMA Samples
(After Ignition)**

| | | Prepared HMA Samples | | | | |
|----------------------------|------------------|----------------------|----------|----------|----------|----------|
| | | Code No. | Code No. | Code No. | Code No. | Code No. |
| | | | | | | |
| Laboratory Balance | Initial Mass, g | | | | | |
| | Final Mass, g | | | | | |
| Furnace Balance | Initial Mass, g | | | | | |
| | Final Mass, g | | | | | |
| AGGREGATE | | | | | | |
| Dry mass before washing, g | | | | | | |
| Dry mass after washing, g | | | | | | |
| GRADATION | % Passing | | | | | |
| | 16.0 mm | | | | | |
| | 13.2 mm | | | | | |
| | 9.5 mm | | | | | |
| | 4.75 mm | | | | | |
| | 2.36 mm | | | | | |
| | 1.18 mm | | | | | |
| | 600 µm | | | | | |
| | 300 µm | | | | | |
| | 150 µm | | | | | |
| 75 µm | | | | | | |

Laboratory Name: _____ Date Tested: _____