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MIX DESIGN (BC, MB, NB, NL, NS, PE and SK)

PLEASE NOTE: Type A laboratories are **NOT** required to carry out additional testing on Mix compliance (MC) samples

Lab Mix Samples

One bag of coarse and one bag of fine aggregate for each of two mix designs (four bags total) along with asphalt cement have been provided.

Note 1. To ensure that all laboratories receive identical samples, the fine aggregate samples have been recombined from individual sieve sizes. Before commencing any testing, these samples should be **carefully but thoroughly mixed** (each fine aggregate separately) by running through a mini-splitter several times.

Note 2. Pay attention to the notes included with each weigh card.

PREPARATION OF THE MATERIALS BY THE PARTICIPATING LABORATORIES

On receipt of the bulk samples of coarse and fine aggregate, dry the samples to constant mass and size the **coarse** aggregate (down to 2.36 mm size).

TESTING

AGGREGATES

Coarse aggregates shall be tested according to ASTM C127 "Method of test for Relative Density and Absorption of Coarse Aggregate" and fine aggregates shall be tested according to ASTM C128 "Method of test for Relative Density and Absorption of Fine Aggregate". For the fine aggregate, remove the material finer than 75µm following the procedure in ASTM C117 prior to testing.

Two determinations for each aggregate **(MDCA-I-N; MDCA-II-N, MDFA-I-N; MDFA-II-N)** are required. Report the "Oven Dry" Relative Density (OD) to the nearest 0.001. Calculate the absorption and report to the nearest 0.001%.

MIXES

Combine the dried aggregate and asphalt cement **(MDAC-I-N or MDAC-II-N)** in the proportions given on the attached mix "WEIGH CARDS", for Material I and Material II on page **3**. ASTM D6926 "Practice for Preparation Bituminous Specimens Using Marshall Apparatus" shall then be followed to prepare the Marshall specimens.

Note 3. Samples for each Marshall briquette specimen and Maximum Relative Density Test are to be batched individually. A total of six (6) briquettes and two (2) Maximum Relative Density samples shall be prepared for each mix. Manual compaction of briquettes shall be carried out using **75 blows per side**. For mechanical hammers, each lab shall determine and use its own equivalency to this compaction effort.

Note 4. With the manual hammer, the following should be noted: (a) compaction pedestal must be secured; (b) the timing of blows should be 60± 5 blows per minute; (c) the hammer should be allowed to rebound between successive blows.

The mixing temperature and **compaction temperature** shall be as indicated on the mix design weigh card forms. **Trough, moulds and hammers** shall be preheated to **135±5°C.**

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Thereafter the specimens, produced in two groups of three for each mix, shall be tested for:

1. Bulk relative density, D2726, “Bulk Specific Gravity and Density of Non-Absorptive Compacted Bituminous Mixtures”

2. Marshall stability and flow, D6927, “Marshall Stability and Flow of Bituminous Mixtures”.

Note 5: Stability must be reported in Newtons and Flow in 0.25mm units.

3. Maximum Specific Gravity, D2041, “Theoretical Maximum Specific Gravity and Density of Bituminous Paving Mixtures”

Note 6. To allow a proper comparison, the Maximum Relative Density test shall be carried out on un-compacted freshly mixed material.

4. Air voids, D3203, “Determination of Percent Air Voids in Compacted Dense Bituminous Pavement Mixtures”

5. VMA, AI-MS2, “Percent VMA in Compacted Mixtures” (total mixture basis).

Note 7: Please identify the method used for the determination of flow by selecting from the dropdown feature on the Reporting Form.

All test results shall be reported online and submitted by **2023 January 6, Friday.** An example of a completed report form is shown on Pages 4 and 5.

Remember: Your lab’s worksheets must be submitted through the portal with your proficiency report. Please combine all worksheets for each portal report into a single pdf prior to uploading. You are required to keep all original worksheet hard copies in a secure dedicated location such as a sealed envelope that is available to CCIL upon request. Do not courier/mail/fax/e-mail the worksheets to CCIL.

DO NOT send reports and worksheets by fax

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Mix Design – Material I

Weigh Card (mass in grams)

Mass Type	Coarse Aggregate MDCA-I-N						Fine Aggregate MDFA-I-N	Dust	Asphalt Cement MDAC-I-N
		13.2mm *	9.5mm	4.75mm	2.36mm	Pass ** 2.36mm			
Individual		23.2	247.3	298.6	18.9	8.0	550.2	41.3	62.5
Cumulative		23.2	270.5	569.1	588.0	596.0	1,146.2	1,187.5	1,250.0

Mixing Temperature = **145°C** Compaction Temperature = **134°C**

AC Content (by Total Mix Mass) = **5.00%** This Equates to **5.26%** by Aggregate Mass

Notes:

1 ***** Is material retained on the 13.2mm sieve to be discarded? **No**

2 ****** Is material passing the 2.36mm sieve material from coarse aggregate to be discarded? **No**

OR

has the pass 2.36mm sieve material been included in the component package? **No**

3. *** Has dust been supplied separately? **Yes. In a separate bag with the coarse aggregate**.

4. Masses provided for BRD specimens are to be adjusted proportionally to provide for Maximum Theoretical Relative Density (MRD) test samples.

Mix Design – Material II

Weigh Card

(mass in grams)

Mass Type	Coarse Aggregate MDCA-II-N						Fine Aggregate MDFA-II-N	Dust	Asphalt Cement MDAC-II-N
		13.2mm *	9.5mm	4.75mm	2.36mm	Pass ** 2.36mm			
Individual		11.2	226.5	266.1	11.6	5.4	636.6	30.1	62.5
Cumulative		11.2	237.7	503.8	515.4	520.8	1,157.4	1,187.5	1,250.0

Mixing Temperature = **148°C** Compaction Temperature = **135°C**

AC Content = **5.00%** This Equates to **5.26%** by Aggregate Mass

Notes:

1. ***** Is material retained on the 13.2mm sieve to be discarded? **No**

2. ****** Is material passing the 2.36mm sieve material from coarse aggregate to be discarded? **NO**

OR

has the pass 2.36mm sieve material been included in the component package? **NO**

3. *** Has dust been supplied separately? **YES. In a plastic bag with the fine aggregate bag.**

4. Masses provided for BRD specimens are to be adjusted proportionally to provide for Maximum Theoretical Relative Density (MRD) test samples.

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Canadian Council of Independent Laboratories

2020 Asphalt Reporting Form
Mix Design

Mix Design Report - Certification Program

- **CCIL Confidential Lab #** CCIL 999
- **Lab Name:** Demo Lab
- **Tested by:**
  - ○ Lab Technician
  - ○ Supervisor / Manager
  - ◉ Not listed

Please specify

Super Technician

Mix Design Report

Test	A-MD-xxx x	A-MD-xxx y	- Avg	B-MD-xxx x	B-MD-xxx y	- Avg
BRD - *LS-262/D2726*	2.376	2.380	2.378	2.421	2.430	2.426
MRD - *LS-264/D2041*	2.485	2.484	2.484	2.504	2.504	2.504
% Voids	4.5	4.4	4.5	3.2	3.0	3.1
% VMA	15.6	15.8	15.7	14.2	14.4	14.3

Flow Measurement

Automated Method

Marshall Stability and Flow of Bituminous Mixtures - *LS-263/D6927*

Test	A-MD-xxx x	A-MD-xxx y	- Avg	B-MD-xxx x	B-MD-xxx y	- Avg
Stability (N)	10864	11625	11245	9424	9821	9623
Flow (0.25mm units)	10.4	10.2	10.3	9.6	10.2	9.9

Note: BRD values under “x” and “y” are the average of the group of 3 specimens.

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Relative Density and Absorption of Coarse Aggregate - *LS-604/T85*

Test	A-MD-xxx x	A-MD-xxx y	- Avg	B-MD-xxx x	B-MD-xxx y	- Avg
BRD - CA	2.705	2.702	2.704	2.694	2.689	2.692
Absorption - CA	1.358	1.385	1.372	1.403	1.391	1.397

Relative Density and Absorption of Fine Aggregate - *LS-605/T84*

Test	A-MD-xxx x	A-MD-xxx y	- Avg	B-MD-xxx x	B-MD-xxx y	- Avg
BRD - FA	2.671	2.675	2.673	2.671	2.666	2.669
Absorption - FA	1.741	1.728	1.735	1.766	1.744	1.755

Comments