

YEAR 2018 CCIL CORRELATION

MIX DESIGN (Ontario)

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

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 LS-604 (Latest Revision) "Method of test for Relative Density and Absorption of Coarse Aggregate" and fine aggregates shall be tested according to LS-605 (Latest Revision) "Method of test for Relative Density and Absorption of Fine Aggregate". Two determinations for each aggregate (**I-MDCA-(N)**; **II-MDCA-(N)**, **I-MDFA-(N)**; **II-MDFA-(N)**) are required.

MIXES

Combine the dried aggregate and asphalt cement (**I-MDAC-(N)** or **II-MDAC-(N)**) in the proportions given on the attached mix "WEIGH CARDS", for Material I and Material II on page 3. MTO laboratory test method LS-261 (latest revision) "Method of Test for Preparation of Marshall Specimens" 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**.

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 shall be tested for:

1. Bulk relative density, LS-262 (latest revision), "Bulk Relative Density of Compacted Bituminous Mixes"
2. Marshall stability and flow, LS-263 (latest revision), "Resistance to Plastic Flow of Bituminous Mixtures using the Marshall Apparatus".

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

3. Maximum relative density, LS-264 (latest revision), "Theoretical Maximum Relative Density of Bituminous Paving Mixtures"

Note 6: To allow a proper comparison, the Maximum Relative Density test shall be carried out on uncompacted freshly mixed material as described in Section 5 including the heat treatment (Item 5.10).

4. Air voids, LS-265, (latest revision), "Determination of Percent Air Voids in Compacted Dense Bituminous Pavement Mixtures"
5. VMA, LS-266 (latest revision), "Determination of VMA in Compacted Bituminous Mixtures"

All test results shall be reported online and submitted by **January 5 2018**. An example of a completed report form is shown on page 4.

Hard copies of the report forms and work sheets must be submitted by **January 5 2018** by mail or courier to:

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CCIL Program Manager
3410 South Service Road, Suite 104
Burlington, Ontario, L7N 3T2
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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 I-MDCA-(N)						Fine Aggregate I-MDFA-(N)	Dust	Asphalt Cement I-MDAC-(N)
	13.2mm *	9.5mm	4.75mm	2.36mm	Pass ** 2.36mm				
Individual	18.0	196.9	280.9	12.1	5.1	627.1	39.9	66.0	
Cumulative	18.0	214.9	495.8	507.9	513.0	1140.1	1180.0	1246.0	

Mixing Temperature = 148°C Compaction Temperature = 135°C
AC Content = 5.3%

Notes:

- * Is material retained on the 13.2mm sieve to be discarded? **No**
- ** 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**
- *** Has dust been supplied separately? **Yes. In a separate bag with the fine aggregate.**
- 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 II-MDCA-(N)						Fine Aggregate II-MDFA-(N)	Dust	Asphalt Cement II-MDAC-(N)
	13.2mm *	9.5mm	4.75mm	2.36mm	Pass ** 2.36mm				
Individual	18.5	202.7	289.1	12.4	5.3	637.6	8.2	70.9	
Cumulative	18.5	221.2	510.3	522.7	528.0	1165.6	1173.8	1244.7	

Mixing Temperature = 148°C Compaction Temperature = 135°C
AC Content = 5.7%

Notes:

- * Is material retained on the 13.2mm sieve to be discarded? **No**
- ** 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**
- *** Has dust been supplied separately? **YES. In a plastic bag within the fine aggregate bag.**
- Masses provided for BRD specimens are to be adjusted proportionally to provide for Maximum Theoretical Relative Density (MRD) test samples.

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2018 CCIL CORRELATION - ONTARIO						
Testing Admin Information				your assigned CCIL Asphalt Lab No.:		ON999
• Lab Name (include Branch or Mobile #)						
• E-mail Address						
• Reported by (Contact Name)						
• Phone Number (Contact)	(999) 999-9999					
• Tested by (Name(s))						
• Results Reporting Date	January 5 2018					
* For Type A Laboratories.						
MIX DESIGN - MARSHALL						
Results for:	Material I			Material II		
Sample Number	x	y	Average	x	y	Average
• BRD	2.376	2.380	2.378	2.421	2.430	2.426
• MRD	2.485	2.484	2.485	2.501	2.504	2.503
• % 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
• Stability (N)	10,864	11,625	11,245	9,424	9,821	9,623
• Flow (0.25mm units)	10.4	10.2	10.3	9.6	10.2	9.9
Aggregate Properties						
• BRD - CA	2.705	2.702	2.704	2.694	2.689	2.692
• BRD - FA	2.671	2.675	2.673	2.671	2.666	2.669
•						
• Absorption - CA	1.358	1.385	1.372	1.403	1.391	1.397
• Absorption - FA	1.741	1.728	1.735	1.766	1.744	1.755

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