

YEAR 2010 CCIL CORRELATION

PART A: MIX DESIGN (Province of Alberta)

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 2.5 mm size).

TESTING

AGGREGATES

Coarse aggregates shall be tested according to C127 "Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate" and fine aggregates shall be tested according to C128, "Density, Relative Density (Specific Gravity) and Absorption of Fine Aggregate". Two determinations for each aggregate (**A-MDCA-#; B-MDCA-#, A-MDFA-#; B-MDFA-#**) are required.

All test results shall be reported in the designated spaces in the (MS Excel) Mix Design Report form which shall be returned by e-mail. An example of a completed mix design form is shown on page **1- 4** of this instruction package.

MIXES

Combine the dried aggregate and asphalt cement (**A-MDAC-# or B-MDAC-#**) in the proportions given on the attached mix "WEIGH CARDS", for Material I and Material II on page **1-3**. MTO laboratory test method D6926 "Preparation of Bituminous Specimens Using Marshall Apparatus" shall then be followed to prepare the Marshall specimens.

Note 3. Each sample for each Marshall briquette specimen and Maximum Relative Density Test is to be batched individually. A total of six (6) briquettes and two (2) Maximum Relative Density samples shall be prepared for each mix. 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**.

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

1. Bulk relative density, D2726, "Bulk Specific Density and Gravity of Non-Absorptive Compacted Bituminous Mixes"

YEAR 2010 CCIL CORRELATION

2. Marshall stability and flow, D6927, "Marshall Stability and Flow and Flow of Bituminous Mixtures"
3. Maximum Specific Gravity, T209 "Theoretical Maximum Specific Gravity and Density of Hot Mix Asphalt (HMA)"

Note 5. To allow a proper comparison, the Maximum Specific Gravity test shall be carried out on uncompacted freshly mixed material including the heat treatment.
4. Air voids, D3203 "Percent Air Voids in Compacted Dense and Open Bituminous Pavement Mixtures"
5. VMA, TLT301, "Determination of VMA in Compacted Bituminous Mixtures"

All test results shall be reported by e-mail in the designated spaces on the (MS-Excel) Mix Design Report form.

The completed Mix Design Report form shall be e-mailed to ibullen@ccil.com by **January 8, 2010** (listed separately on CCIL Web Site). An example of a completed report form is shown on page 1-4.

Hard copies of the report forms and work sheets must be submitted by **January 8, 2010** by mail or courier to:

Nabil Kamel, M.A.Sc., P.Eng.
CCIL Program Manager
3166 Lakeshore Road
Burlington, Ontario, L7n 1A4
Tel: 905-632-6456: Fax: 905-632-1990: e-mail: nkamel@ccil.com

DO NOT send reports and worksheets by fax

YEAR 2010 CCIL CORRELATION

Mix Design – Material I
Weigh Card (mass in grams)

Mass Type	Coarse Aggregate A-MDCA						Fine Aggregate	Dust	Asphalt Cement
	12.5mm *	10.0mm	6.7mm	5.0mm	2.5mm	Pass ** 2.5mm	A-MDFA		A-MDAC
Individual	19.1	186.7	n/a	325.8	26.5	9.1	567.2	37.4	68.2
Cumulative	19.1	205.8	n/a	531.6	558.1	567.2	1,134.4	1,171.8	1,240

Mixing Temperature = 150°C Compaction Temperature = 135°C

Notes:

1. * Is material retained on the 12.5mm sieve to be discarded? **No**
2. ** Is material passing the 2.5mm sieve material from coarse aggregate to be discarded? **No**
OR
has the pass 2.5mm sieve material been included in the component package? **No**
3. *** Has dust been supplied separately? **Yes. In a separate bag with the coarse aggregate.**
Aggregates may exhibit stripping. Do NOT use antistripping additive.
4. Masses provided for Mix Design 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 B-MDCA						Fine Aggregate	Dust	Asphalt Cement
	12.5mm *	10.0mm	6.7mm	5.0mm	2.5mm	Pass ** 2.5mm	B-MDFA		B-MDAC
Individual	5.8	116.7	n/a	382.8	65.9	12.3	583.5	11.8	71.2
Cumulative	5.8	122.5	n/a	505.3	571.2	583.5	1,167	1,178.8	1,250

Mixing Temperature = 150°C Compaction Temperature = 138°C

Notes:

1. * Is material retained on the 12.5mm sieve to be discarded? **No**
2. ** Is material passing the 2.5mm sieve material from coarse aggregate to be discarded? **No**
OR
has the pass 2.5mm sieve material been included in the component package? **No**
3. *** Has dust been supplied separately? **Yes. In separate bags**
4. Aggregates may exhibit stripping. Do NOT use antistripping additive.
5. Masses provided for Superpave Gyratory Specimens are to be adjusted proportionally to provide for Maximum Theoretical Relative Density (MRD) test samples.

2010 CCIL CORRELATION – EXAMPLE REPORT MIX DESIGN - ALBERTA						
Testing Admin Information				Enter your assigned Lab No.: AB 12		
<ul style="list-style-type: none"> • Lab Name (include Branch or Mobile #) • E-mail Address • Reported by (Contact Name) • Phone Number (Contact) • Tested by (Name(s)) • Results Reporting Date 	Apex Construction					
			enstein@apex.xom			
			Frank Enstein			
			(999) 999-9999			
			Joe Blow			
			January 8, 2010			
* For Type A Laboratories.						
MIX DESIGN - MARSHALL						
MIX DESIGN MARSHALL TESTS						
Results for:	A-MD			B-MD		
Sample number	x	y	Average	x	y	Average
• <i>BRD</i>	2.376	2.380	2.378	2.421	2.430	2.426
• <i>MRD</i>	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)	10864	11625	11245	9424	9821	9623
• Flow (0.25mm units)	10.4	10.2	10.3	9.6	10.2	9.9
Aggregate Properties						
• <i>BRD - CA</i>	2.705	2.702	2.704	2.694	2.689	2.692
• <i>BRD - FA</i>	2.671	2.675	2.673	2.671	2.666	2.669
•						
• <i>Absorption - CA</i>	1.358	1.385	1.372	1.403	1.391	1.397
• <i>Absorption - FA</i>	1.741	1.728	1.735	1.766	1.744	1.755

Save as **Mix Design – Marshall – Report – Lab ###** (where ### is your code number)