Improvements in Asphalt Testing

by

Nabil Kamel, M.A.Sc. P.Eng.

CCIL Program Manager

OAPC PIQ Seminars, 2017
Improvements in Asphalt Testing

Table of contents

- Background/Introduction-who CCIL is? what do we do?
- CCIL certification programs make up
- 2017 CCIL Certification Programs Overview
- Results of inter-lab correlation test results
- Summary of lab certification benefits
Introduction
Who CCIL is? what do we do?

- non-profit organization
- Safeguarding the Public and the environment
- Help protect quality, reliability and integrity of our road network, transportation system and our buildings
- Provide laboratory and Technician certification programs for the highway construction industry involved in asphalt, concrete, aggregate and soils materials testing
Introduction

Who CCIL is? what do we do?

- CCIL provides an independent 3rd. party assessment with no interest in the ramification of the results
- We have been in business for over 25 years. Started asphalt laboratory certification in Ontario in the late 80’s and evolved to be a well respected Canadian National Organization with CCIL certified labs in all Provinces
- We have @ 900 lab certifications, Nation-wide
- Sole Canadian provider of laboratory and technician certifications for testing highway construction materials in Canada
CCIL Certification Program Make-up Asphalt and Aggregate Materials

- The cornerstone of the program are Integrity and Confidentiality as per ISO 17025
- In addition, CCIL directive for a distinct effort of the CCIL staff to work with the labs to improve results/raise standards of testing
CCIL Certification Program Make-up Asphalt and Aggregate Materials

- CCIL Certification Programs are administered by **LOCAL** Admin Committees entrusted with establishing, reviewing, and revising, as necessary, the technical criteria for the core elements of the program in accordance with overall CCIL criteria
- Participation in the local Administration Committees by all *local Stakeholders*: testing labs, contractor labs, Provincial Government and Municipal Authorities.
In general, the CCIL certification programs are in compliance with ISO 17025, with 5 main components:

- Laboratory Inspections
- Proficiency sample testing on annual basis
- Proficiency samples program follow-up
- Quality manual & Internal Audits
- Technician Certification
## CCIL Certification Program Make-up

### Asphalt and Aggregate Materials

<table>
<thead>
<tr>
<th></th>
<th>CCIL</th>
<th>Canadian Mix Exchange</th>
<th>ISO 17025</th>
<th>AASHTO/AMRL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interlab Correlation</td>
<td>√</td>
<td>√</td>
<td>?</td>
<td>√</td>
</tr>
<tr>
<td>Correlation Follow up</td>
<td>√</td>
<td>-</td>
<td>-</td>
<td>?</td>
</tr>
<tr>
<td>Lab Audits</td>
<td>√</td>
<td>-</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Quality System</td>
<td>√</td>
<td>-</td>
<td>√</td>
<td>√</td>
</tr>
<tr>
<td>Technician Certificate</td>
<td>√</td>
<td>-</td>
<td>-</td>
<td>√</td>
</tr>
</tbody>
</table>
CCIL Certification Programs Overview, 2017

- Asphalt and Aggregate certified laboratories in AB, BC, MB, NB, NL, ON and SK
  - Total number of Asphalt laboratories..................223
  - Total number of Aggregate laboratories..............343

- Concrete certified laboratories nation-wide, in all provinces as well as in the NW Territories
  - Total number of Concrete laboratories.................333
  - Over 5500 certified technicians in HMA, Agg & Concrete
CCIL Certification Program; %AC – Ignition Correlation Results

<table>
<thead>
<tr>
<th></th>
<th>2008</th>
<th>2012</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean, BC</td>
<td>5.11</td>
<td>5.11</td>
<td>5.08</td>
<td>5.10</td>
</tr>
<tr>
<td>Mean, ON</td>
<td>5.03</td>
<td>5.10</td>
<td>5.08</td>
<td>5.11</td>
</tr>
<tr>
<td>SD, BC</td>
<td>0.17</td>
<td>0.12</td>
<td>0.12</td>
<td>0.10</td>
</tr>
<tr>
<td>SD, ON</td>
<td>0.10</td>
<td>0.10</td>
<td>0.11</td>
<td>0.09</td>
</tr>
</tbody>
</table>
## CCIL Certification Program: Mix Compliance Correlation Results

<table>
<thead>
<tr>
<th>Group</th>
<th>2008</th>
<th>2012</th>
<th>2016</th>
<th>2017</th>
</tr>
</thead>
<tbody>
<tr>
<td>SD, BRD, BC</td>
<td>0.091</td>
<td>0.050</td>
<td>0.014</td>
<td>0.016</td>
</tr>
<tr>
<td>SD, BRD, ON</td>
<td>0.010</td>
<td>0.010</td>
<td>0.013</td>
<td>0.016</td>
</tr>
<tr>
<td>SD, AV, BC</td>
<td>1.269</td>
<td>1.185</td>
<td>0.71</td>
<td>0.50</td>
</tr>
<tr>
<td>SD, AV, ON</td>
<td>0.405</td>
<td>0.441</td>
<td>0.65</td>
<td>0.47</td>
</tr>
<tr>
<td>SD, VMA, BC</td>
<td>1.583</td>
<td>??</td>
<td>0.41</td>
<td>0.64</td>
</tr>
<tr>
<td>SD, VMA, ON</td>
<td>0.500</td>
<td>0.616</td>
<td>0.46</td>
<td>0.62</td>
</tr>
</tbody>
</table>
Percent Crushed Particles

Coefficient of Variation, %

Mean Value

MTO Precision
Mean: 50 - 75%
C.O.V: 8 - 12%
Absorption of Coarse Aggregate

Pre 1998
Post 1997
ASTM C 127
Avg. 98 - 04
Standard Deviation
Mean Value
ASTM C 127 Precision
Post 1997 Average, 0.09
CCIL Certification Program Results

- Results from AB, BC and ON confirm significant improvements in test result variations after lab certification.
- ON, BC and AB reported significant reductions in the number of contract disputes after introduction of lab certification.
Summary Lab certification Benefits

Regular lab auditing & participation in Prof. Tests

- Ensures up-to-date & uniform test procedures
- Ensures testing is by qualified and trained staff
- Ensures equipment are calibrated and maintained
- Encourage technician training/certification
- Improves standard of excellence in testing
- Increases confidence in test results
- Reduces test variations and
- Reduces potential for job interruptions and disputes
Lab Certification is a win-win to all

- Regulators: the assurance that regulation is supported by valid test data
- Owners: the assurance that the project is built in accordance with the specified test requirements
- Contractors, producers, consultants & testing laboratories: improved confidence in testing results and reduced potential for job interruptions, construction delays and contract disputes
CCIL Laboratory and Technician Certification Programs

Thank you

nkamel@ccil.com

Questions?