LEVY
SOLUTIONS FOR YOUR ENVIRONMENT®
Reducing the Number of Asphalt Mixture Testing Disputes – The Michigan Solution

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Edw. C. Levy Co.

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About the Edw. C. Levy Co.

Founded: 1918  Size: 1,400+ Employees

Services & Products
• Steel Mill Services
• Aggregates
• Concrete
• Asphalt
• Trucking
• Scrap Handling
• Copper Picking
• Agricultural Products

Locations
• USA
• Australia
• Thailand
• France
• India
• Brazil
Edw. C Levy Group of Companies
International Operations
What We Do

Steel Mill Services
The Early Years
Recycling Since 1918

Ed Levy Sr.
What We Do

Aggregates
What We Do

Concrete
What We Do

Asphalt
Since 1961
RAP Since 1975
Asphalt Production & Paving

MESA MATERIALS INC.

Schmidt Construction Company

ACE-SAGINAW PAVING CO.
Paving Michigan’s Future
Flint - Saginaw
Reducing the Number of Asphalt Mixture Testing Disputes – The Michigan Solution
THE PROBLEM:

1. The number of disputed tests was continuing to increase every year and the MDOT Central Lab could not keep up with the workload.

2. Contractors and MDOT were constantly fighting about whose test results were correct.

3. Two large claims of over seven figures were paid out by MDOT over disputed test results in one year.
THE SOLUTION:


2. A Round Robin Testing Program to identify testing differences.

3. A rigid acceptance protocol that must be passed in order to do testing on any MDOT project.
THE LAB QUALIFICATION PROGRAM
(Started in 2008)

- 5 Person Implementation Team – 3 MDOT and 2 Paving Association Contractor Members
- Requires a Quality Systems Manual Including Calibration and Maintenance Records
- Qualified Lab and Technician Database
- Requires Lab Inspections and Auditing
- AMRL Participation Required
- Review of Testing Procedures for Standardization and Identifying Variables
- Equipment Type Review
THE ROUND ROBIN TESTING PROGRAM

- Same time every year
- 80-100 Labs participate yearly
- Test for 8 Mixture Properties (Gmm, Gmb, AV, VMA, VFA, F/A, Extracted AC, Ignition AC) Gradation on All Sieves, 1 and 2 Crushed Faces, and New This Year - Aggregate Specific Gravity, Fine, Coarse, and Combined
- Must submit an “Internal Audit Checklist” with the test results
- Deadlines must be met
THE ACCEPANCE CRITERIA

- A Tolerance Limit of 2 Standard Deviations from the Mean Value are used to analyze all parameters except gradation where 3 Standard Deviations are used. Labs whose results fall outside these tolerance limits are classified as “deficient”.
- Labs classified as “deficient” must respond in writing with an explanation of the root cause of the deficiency, the steps taken to prevent similar situations, and provide verification testing to verify that the problem is corrected.
THE ACCEPANCE CRITERIA (cont.)

- All written explanations of deficiencies are reviewed by The Laboratory Qualification Implementation Team.
- Satisfactory explanations result in “Successful Completion” of the Round Robin Program.
- Unsatisfactory explanations result in the deficient lab having to go to the next round of testing and run another sample for all properties.
WHAT DID WE LEARN IN THE LAST 6 YEARS?

- At first, almost everyone was mad. There were many complaints including to my boss.
- Some people said we “cherry picked” the samples.
- To prevent talk between labs, we went to multiple samples later on.
- Needed to use a standard reporting spreadsheet to make data analysis easier.
- Some labs always fail.
WHAT DID WE LEARN IN THE LAST 6 YEARS? (cont.)

- At first, almost everyone wanted to leave their lab name out. Now over 80% use their lab name on the final results sheet
- Had to help the labs with their written responses at first. Developed a “Corrective Action Report” and a “Failures and Responses” guidance document
- Total oven time is critical
- Who does the calibrating of the sensitive equipment?
WHAT DID WE LEARN IN THE LAST 6 YEARS? (cont.)

- The test methods are not always clear (i.e. 3-5 minute soak, damp towel, pat it dry, shake the puck to remove bubbles, lay the puck flat or on its side, reheating times, does the Gmm sample go back in the oven, how you load the gyro mold, etc.)

- We clarified unclear items in the testing methods – we let MDOT pick

- Standard Deviations keep getting smaller. Thus nearly the same rate of failures each year
WHAT DID WE LEARN IN THE LAST 6 YEARS? (cont.)

- QC labs that are deficient can use a consultant lab or another of their company labs that have passed to do testing on MDOT projects
- QA labs that are deficient often have no alternates so they must move quickly to resolve any deficiencies
- Labs with good calibration and maintenance procedures and records seem to almost always do well – a good attitude helps
<table>
<thead>
<tr>
<th>Equipment</th>
<th>Date Calibrated</th>
<th>Next Calibration Date</th>
<th>By</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anton-Par 101</td>
<td>Jan 2013</td>
<td>Jan 2014</td>
<td>Anton-Par</td>
</tr>
<tr>
<td>Anton-Par 102</td>
<td>Jan 2013</td>
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<td>Mar 2013</td>
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<td>Cannon</td>
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<tr>
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<td></td>
<td>PMC</td>
</tr>
<tr>
<td>Flow Meter 3MA 330B</td>
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<td>WIKA Pressure Gauge</td>
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<td>PMC</td>
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<tr>
<td>Starrett Calipers</td>
<td>Mar 2013</td>
<td></td>
<td>PMC</td>
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</table>
THE RESULT:

- Number of disputed tests:
  
<table>
<thead>
<tr>
<th>Year</th>
<th>Number</th>
<th>No Round Robin</th>
</tr>
</thead>
<tbody>
<tr>
<td>2008</td>
<td>439</td>
<td></td>
</tr>
<tr>
<td>2009</td>
<td>267</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td>245</td>
<td></td>
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<tr>
<td>2011</td>
<td>112</td>
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<tr>
<td>2012</td>
<td>185</td>
<td></td>
</tr>
<tr>
<td>2013</td>
<td>128</td>
<td></td>
</tr>
</tbody>
</table>

- Average round 1 failure rate:
  
<table>
<thead>
<tr>
<th>Labs</th>
<th>Failure Rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>QC Labs</td>
<td>31%</td>
</tr>
<tr>
<td>QA Labs</td>
<td>18%</td>
</tr>
</tbody>
</table>

- Also, we get along a lot better
THE RESULT (cont.):

Main reasons for failures:

- Attitude
- Improperly maintained equipment
- Variations in test methods
- Improperly calibrated equipment
- Variable oven time or temperature
- Improper splitting of samples
- Overloaded sieves
Absorption Impact on Volumetrics

![Graph showing the impact of mixture aging time on volumetrics with 2.7% Abs and 1.0% Abs indicated.](image_url)
ADVICE:

- Watch reheat times
- Fix the variables in the testing methods
- Use professionals to calibrate equipment
- Change the specs if there is something you don’t like
- Watch temperatures
- Split samples properly
- Watch overloaded sieves
- Work together to resolve differences
Thank You!

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