IA Program Updates

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Independent Assurance

- Unbiased and independent evaluation of all the sampling and testing procedures in the State's Transportation Department's acceptance program / QA

- Required by FHWA through "23 CFR 637 Subpart B"

Why do we care?

Want to:

- Meet Federal requirements
- Ensure Quality Assurance testing remains credible
- Ensure QA testers remain proficient in the testing they conduct
- Ensure QA test equipment is up to standard

How we do it

System Approach – Cover all active acceptance testers and equipment for a given year (>90%)

- Proficiency sample testing for both personnel and equipment
- Statistical analysis of proficiency sample testing results
- Annual report with summary of all IA results, documentation, and findings

Proficiency Sample Testing

2 Methods:

1. AASHTO re:source Proficiency Sample Program (PSP) Testing
   - Thousands of labs testing the same proficiency samples annually
   - Well-suited for lab testing (e.g. Ignition Oven, Aggregate Gradations)

2. In-House Testing
   - Proficiency sample obtained and split by IA personnel and tested by active assurance testing personnel in a large testing group
   - Better suited for field testing (e.g. PCC Air & Slump, Compaction Moisture Density)

AASHTO re:source PSP

- Distribute a proficiency sample to approximately 3,000 participating labs for various tests
- 2 proficiency samples are completed by each District for each test/tests
- AASHTO's subsequent report provides a lab rating and lab performance relative to the other participating labs for each test
- Provides a lot of information but not practical for QA tester/equipment population for field testing (e.g. PCC, Compaction)

In-House Testing

- Proficiency sample acquired by IA personnel
- Large test event scheduled where active QA testers and their equipment come to test the proficiency sample
- Lab ratings and z-scores are calculated for those within the test group using AASHTO re:source's PSP calculations as a baseline
- Info only really allows for inter-District comparison and identification of outliers
- Much more achievable for larger QA population sizes (e.g. PCC having 50-60 testers/equipment)

Statistical Analysis of Results

- For each proficiency sample the average, standard deviation, etc. are calculated. From these z-scores and lab ratings are reported back to the testers who participated in the given proficiency sample
- Z-scores tell us how many standard deviations away a test result is from the sample average

(z-score= -1.5 is 1.5 standard deviations below the average test result)

Lab Ratings

- Z-scores give measure of accuracy relative to other participants of the proficiency sample
- Lab ratings are based on the z-score of a test result

If |Z-Score| <= 1 Then Rating = 5

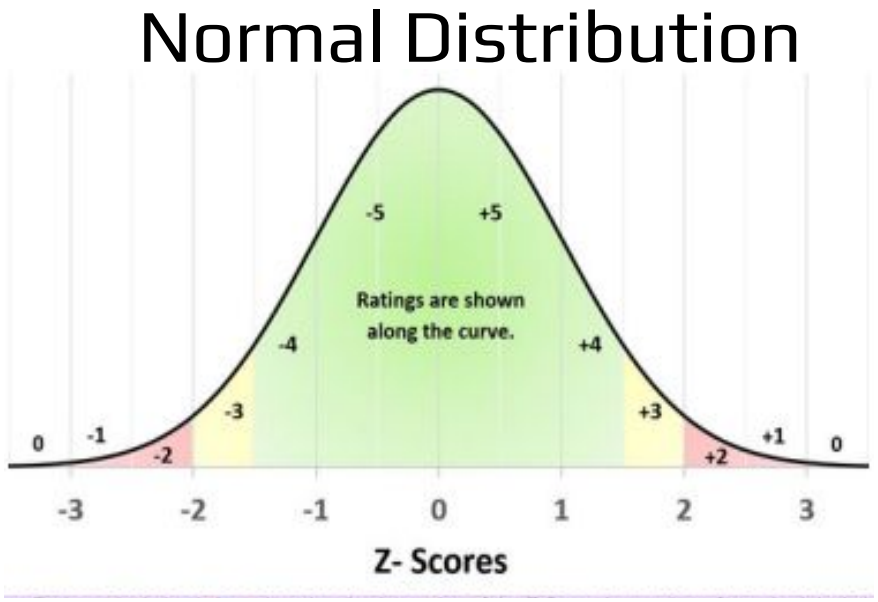
If |Z-Score| > 1 And <= 1.5 Then Rating = 4

If |Z-Score| > 1.5 And <= 2 Then Rating = 3

If| Z-Score| > 2 And <= 2.5 Then Rating = 2

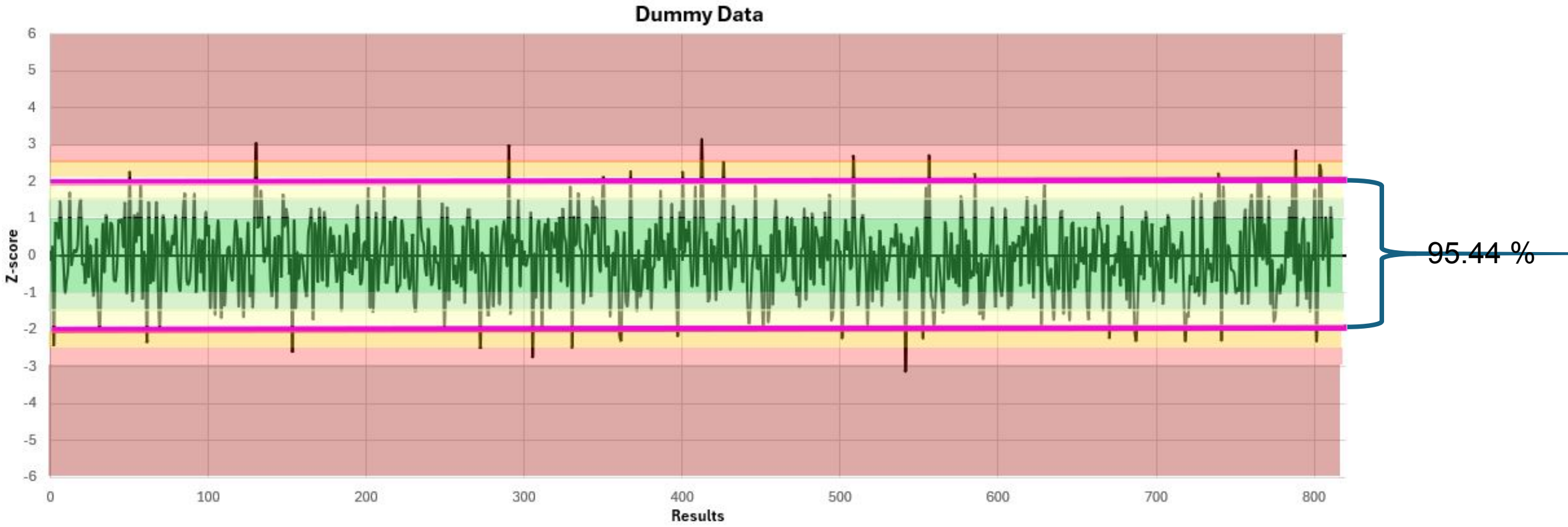
If |Z-Score| > 2.5 And <= 3 Then Rating = 1

If |Z-Score| > 3 Then Rating = 0



- Lab ratings of 2 and lower require a Corrective Action Report (CAR) be completed

Demo Graph of Results



Exampl
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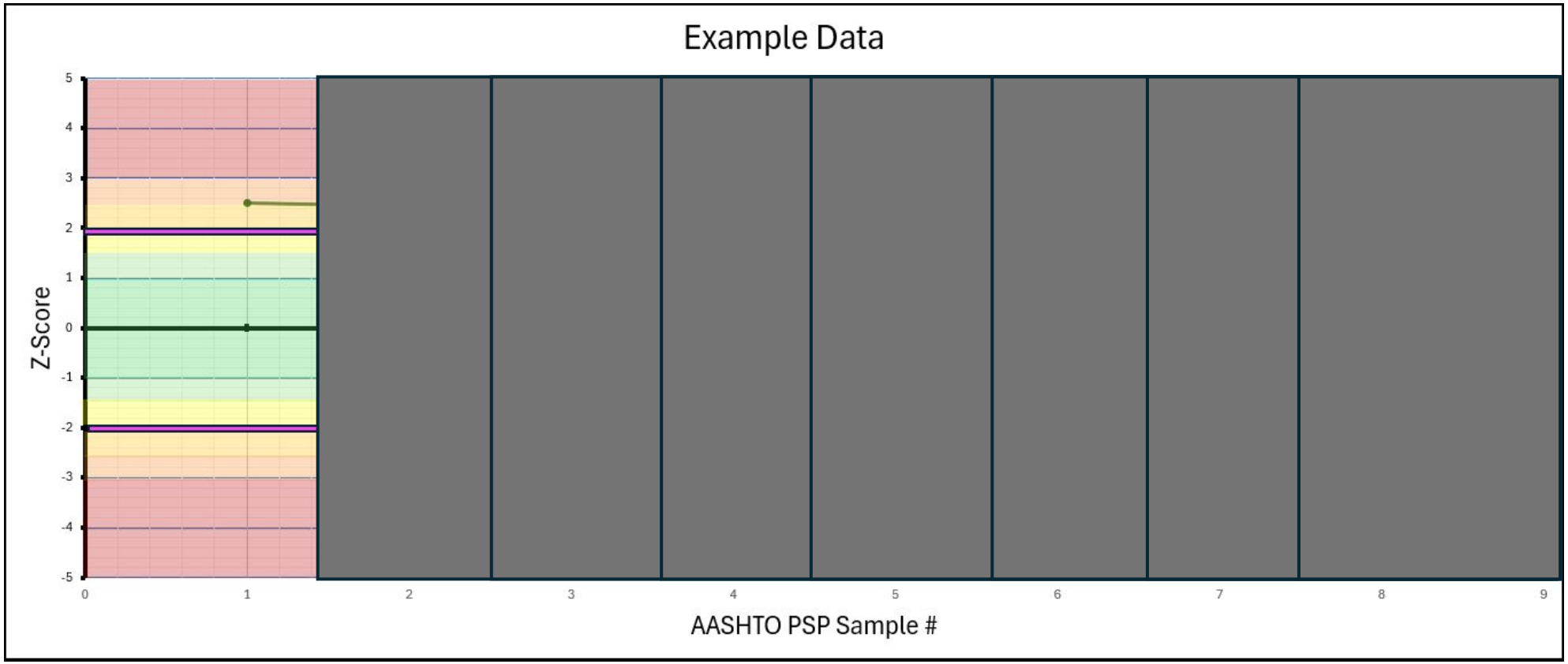
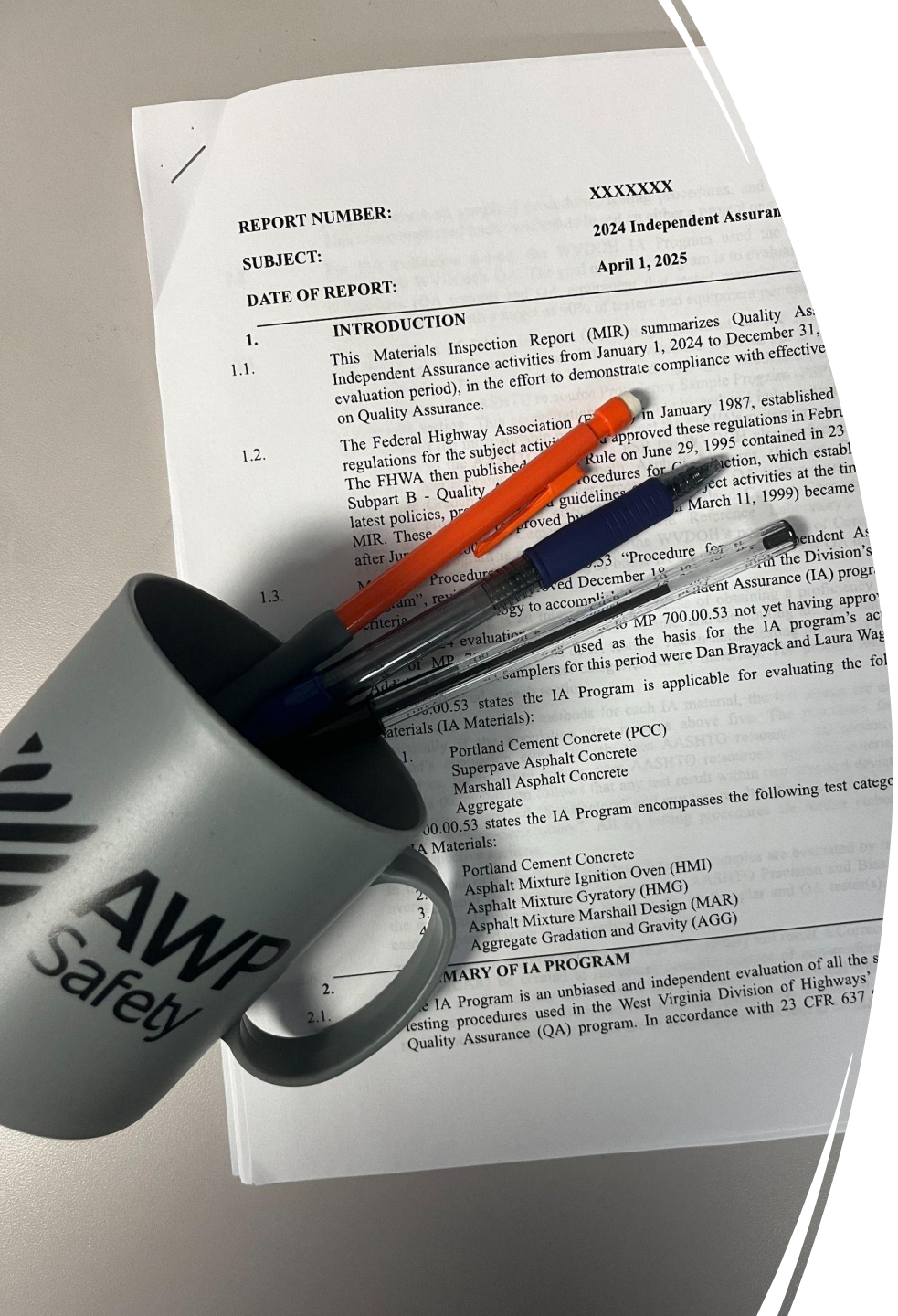
- Z-score = 2.45





Annual Report

Summary of IA activities:

- Completed IA testing and procedures
- Documented active QA testers/equipment
- IA test results and subsequent analysis
- Number/list of CARs/”non-satisfactory” results
- General summary of findings

Documenting Active QA Testers/Equipment

Active QA Testers/Equipment for AASHTO re:source PSP testing (e.g. Ignition Oven, Aggregate Gradation) more easily tracked due to only a few per District lab.

Active QA Testers/Equipment for In-House testing (e.g. PCC, Compaction) tracked through completed AWP QA Sample Records for completed tests

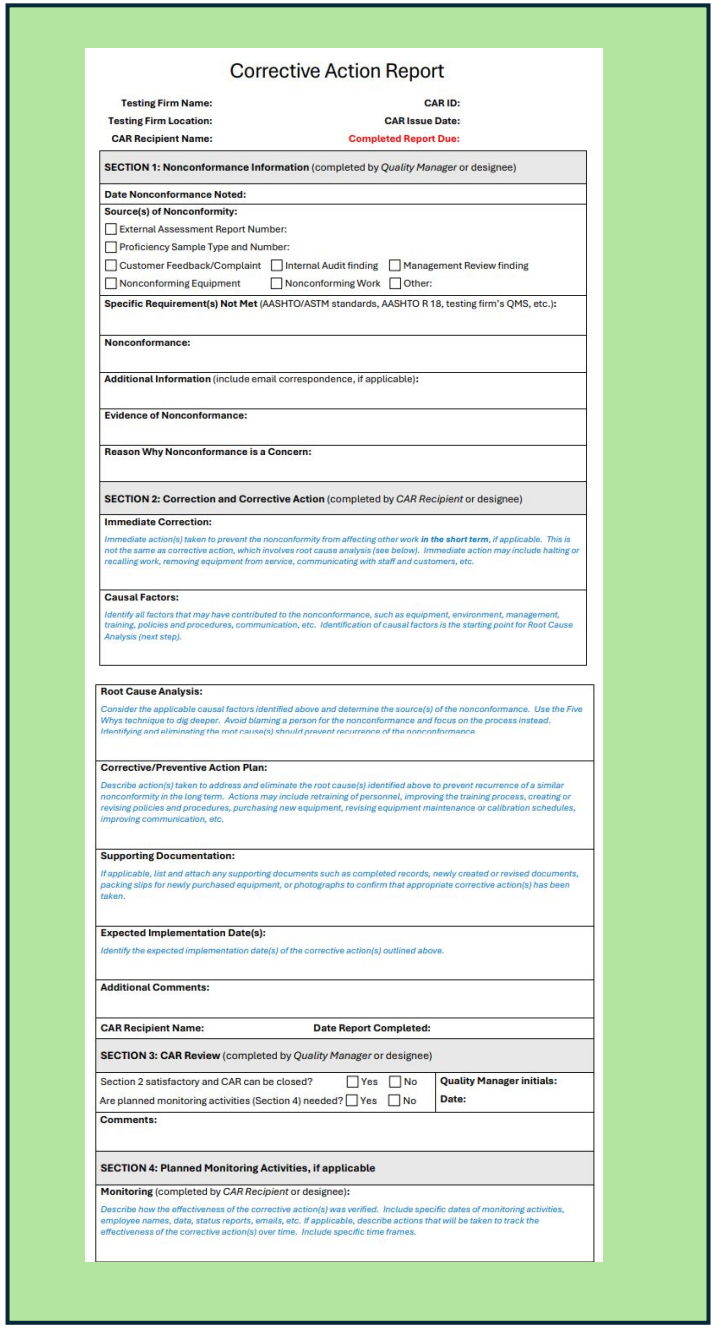
Difficulties due to changes in population throughout year and equipment frequently being unidentified

Active QA equipment is additionally documented with lab inspections/ calibration records

Corrective Action Reports (CARs)

- Results with a lab rating of 2 or less require a CAR be completed
- We require they be completed and sent to MCS&T within 30 days of notification
- Investigation into cause of non-similar result (could be testing procedure, equipment, sampling, etc.)
- Collected for the annual report
- Important for identifying deficiencies in Assurance testing
- Should expect approximately 4.96% of results to have a lab rating of 2 or less if no issues are present

1.24% lab rating of 1 or less and 0.26% lab rating of 0



Corrective Action Report

Testing Firm Name: **CAR ID:**
Testing Firm Location: **CAR Issue Date:**
CAR Recipient Name: **Completed Report Due:**

SECTION 1: Nonconformance Information (completed by *Quality Manager* or designee)

Date Nonconformance Noted:

Source(s) of Nonconformity:
☐ External Assessment Report Number:
☐ Proficiency Sample Type and Number:
☐ Customer Feedback/Complaint ☐ Internal Audit finding ☐ Management Review finding
☐ Nonconforming Equipment ☐ Nonconforming Work ☐ Other:

Specific Requirement(s) Not Met (AASHTO/ASTM standards, AASHTO R 18, testing firm's QMS, etc.):

Nonconformance:

Additional Information (include email correspondence, if applicable):

Evidence of Nonconformance:

Reason Why Nonconformance is a Concern:

SECTION 2: Correction and Corrective Action (completed by *CAR Recipient* or designee)

Immediate Correction:
*Immediate action(s) taken to prevent the nonconformity from affecting other work **in the short term**, if applicable. This is not the same as corrective action, which involves root cause analysis (see below). Immediate action may include halting or recalling work, removing equipment from service, communicating with staff and customers, etc.*

Causal Factors:
Identify all factors that may have contributed to the nonconformance, such as equipment, environment, management, training, policies and procedures, communication, etc. Identification of causal factors is the starting point for Root Cause Analysis (next step).

Root Cause Analysis:
Consider the applicable causal factors identified above and determine the source(s) of the nonconformance. Use the Five Whys technique to dig deeper. Avoid blaming a person for the nonconformance and focus on the process instead. Identifying and eliminating the root cause(s) should prevent recurrence of the nonconformance.

Corrective/Preventive Action Plan:
Describe action(s) taken to address and eliminate the root cause(s) identified above to prevent recurrence of a similar nonconformity in the long term. Actions may include retraining of personnel, improving the training process, creating or revising policies and procedures, purchasing new equipment, revising equipment maintenance or calibration schedules, improving communication, etc.

Supporting Documentation:
If applicable, list and attach any supporting documents such as completed records, newly created or revised documents, packing slips for newly purchased equipment, or photographs to confirm that appropriate corrective action(s) has been taken.

Expected Implementation Date(s):
Identify the expected implementation date(s) of the corrective action(s) outlined above.

Additional Comments:

CAR Recipient Name: **Date Report Completed:**

SECTION 3: CAR Review (completed by *Quality Manager* or designee)

Section 2 satisfactory and CAR can be closed? ☐ Yes ☐ No
Are planned monitoring activities (Section 4) needed? ☐ Yes ☐ No
Quality Manager initials:
Date:

Comments:

SECTION 4: Planned Monitoring Activities, if applicable

Monitoring (completed by *CAR Recipient* or designee):
Describe how the effectiveness of the corrective action(s) was verified. Include specific dates of monitoring activities, employee names, data, status reports, emails, etc. If applicable, describe actions that will be taken to track the effectiveness of the corrective action(s) over time. Include specific time frames.

Covered IA Testing and Procedures

AASHTO re:source PSP Testing:
• Asphalt Mixture Ignition Oven (HMI)
• Asphalt Mixture Gyratory (HMG)
• Asphalt Mixture Marshall Design (MAR)
• Aggregate Gradation and Gravity (AGG)

In-House Testing:

• Portland Cement Concrete
  • Slump & Air Content
  • Compressive Strength

• Compaction Moisture & Density
  • Soils
  • Asphalt (2026)
  • Stone (2026)

Asphalt Mixture Ignition Oven (HMI)

Hot Mix-Asphalt

Testing Categories

- Asphalt Mixture Ignition Oven (HMI)
- Asphalt Mixture Gyratory (HMG)
- Asphalt Mixture Marshall Design (MAR)

- Asphalt testing category in AASHTO re:source PSP testing
- Has two proficiency samples for the category of tests

Tests Evaluated

Percent Asphalt Binder Content by Ignition Method (AASHTO T 308)

Percent of Total Material Passing the No. 200 Sieve (AASHTO T 30)

Asphalt Mixture Gyratory (HMG)

Hot Mix-Asphalt

Testing Categories
Asphalt Mixture Ignition Oven (HMI)
Asphalt Mixture Gyratory (HMG)
Asphalt Mixture Marshall Design (MAR)

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Tests Evaluated
Bulk Specific Gravity Saturated Surface-Dry Method (Gyratory) (AASHTO T 166)
Bulk Specific Gravity Using Vacuum Sealing Method (AASHTO T 331)
Maximum Specific Gravity (Gyratory) (AASHTO T 209)

Asphalt Mixture Marshall Design (MAR)

Hot Mix-Asphalt

Testing Categories
Asphalt Mixture Ignition Oven (HMI)
Asphalt Mixture Gyratory (HMG)
Asphalt Mixture Marshall Design (MAR)

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Tests Evaluated
Bulk Specific Gravity of Compacted HMA (AASHTO T 166)
Maximum Specific Gravity of HMA Paving Mixtures (AASHTO T 209)
Percent Air Voids via Gmb SSD (AASHTO T 269)
Marshall Stability and Flow of HMA (AASHTO T 245)

Aggregate Gradation and Gravity (AGG)

Tests Evaluated
Percent of Total Material Passing 1/2 in. Sieve (AASHTO T 27)
Percent of Total Material Passing 3/8 in. Sieve (AASHTO T 27)
Percent of Total Material Passing #4 Sieve (AASHTO T 27)
Percent of Total Material Passing #8 Sieve (AASHTO T 27)
Percent of Total Material Passing #16 Sieve (AASHTO T 27)
Percent of Total Material Passing #30 Sieve (AASHTO T 27)
Percent of Total Material Passing #50 Sieve (AASHTO T 27)
Percent of Total Material Passing #100 Sieve (AASHTO T

- Asphalt testing category in AASHTO re:source PSP testing
- Has two proficiency samples for the category of tests

PCC In-House Testing

- Held 1st test group on April 8, 2025, with 49 unique QA testers participating in the proficiency sample testing
    - 1st group also made cylinders for the Compressive Strength IA testing
- Held 2nd test group on October 15, 2025, with 4 additional unique QA testers (8 total)
- A total of 64 QA Testers were documented as performing a QA test through AWP, with 53 testers evaluated through a proficiency sample 83% of PCC QA Testers were evaluated

- A total of 48 Pressure Meters out of 65 documented were evaluated (74%)

- A total of 49 Slump Cones out of 72 documented were evaluated (68%)

- 100% of Compressive Strength machines and Testers were evaluated

Soils Compaction In-House Testing

- Newly done for the 2025 evaluation year
- Evaluated a total of 37 QA Testers and 39 Nuclear Moisture & Density Gauges covering 100% of both populations
- Population of active testers and equipment through AWP was extremely low for soils compaction (only 20 sample records for 2025), those tested were from lists given by the Districts for active testers and their equipment

Additional In-House Testing

- Additional In-House testing was also performed for Asphalt and Aggregate
- Used to evaluate active QA testers/equipment not covered by AASHTO re:source PSP testing

- Asphalt sample covered Ignition Oven testing
- Proficiency sample collected and split by MCS&T

- Aggregate sample covered Gradations for Sieves ½ in. through the #16
- Proficiency sample made and split by MCS&T

Updates for 2026

- Plan to implement In-House IA testing for Compaction on Asphalt and Stone
  - Stone has re-introduced recurring challenges in securing a proficiency sample and hosting large test events for In-House testing on field tests
- First In-House testing is tentatively set for April 16, 2026, for PCC Air & Slump testing (also making cylinders for Compressive Strength testing)