



Oregon

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To: Construction Leadership Team

From: Quality Assurance Steering Committee

Subject: Request for Support to Proceed
HMAC Testing Research

The Quality Assurance Steering Committee (QASC) has been discussing issues related to the “randomness” of the material sampling specifications for HMAC. We believe there is a better approach that would provide more confidence in the testing information used for evaluation, acceptance, and payment of HMAC.

BACKGROUND

The quality assurance (QA) program for materials was initiated and implemented by ODOT in the mid-1990's. The program required Contractors to provide quality control testing of materials that would be used for acceptance and payment if verified by ODOT QA staff. ODOT staff had been performing all materials testing up to that point. ODOT retained a large base of staff with materials and testing experience and expertise during the infant stages of the QA program. This coupled with Contractor's steep learning curve for gaining knowledge and experience in materials and testing, kept suspicions of “working the system” to a minimum. We are now 20 years into the QA program and the roles have reversed. Contractors now have the large pool of staff with materials experience and expertise and ODOT has a much more limited pool. The opportunity for “working the system” without being caught by ODOT is much greater. The recent audit of ODOT's QA program by FHWA also expressed concerns about confidence in the data being used for HMAC payment. ODOT spends millions of dollars every year for HMAC, so confidence in the data used to accept and pay on should be at a high level.

PROBLEM STATEMENT

There needs to be a way to modify the QA program to provide more confidence in the data being generated by Contractor staff. FHWA suggested increased testing by ODOT staff and the use of comparative statistical analyses as potential improvements and the QASC has already begun researching these options. FHWA also suggested “end product” testing as another option. That suggestion is the subject of this paper.

HMAC Mixture Samples

Samples of HMAC mixtures used for testing of gradation, asphalt content, and moisture content used for acceptance and price adjustment calculations are currently taken either at the discharge of the asphalt plant or from a delivery truck. The choice of location is

the Contractor's. ODOT's price adjustment process (StatSpec) assumes that samples are obtained on a random basis and that there is no bias in the sampling and testing. One "random" sample is required for every 1,000 tons of produced mixture. The current program requires the Contractor to generate and supply ODOT with a set of random tonnages at which a sample of mixture must be taken. The method for generating the random numbers is correct. However, the Contractor QC and plant operator have the list of random numbers, so they know when samples will be taken. Thus, the potential exists for an operator to modify the production settings at the plant around the tonnage (or time) a sample is to be taken. Here exists an opportunity to inject bias into the test results (and resulting price adjustment calculations as well as HMAC quality). ODOT QA staff also generate their own set of random numbers separate from the Contractor, however, most operators would be able to make adjustments to their process within the few minutes it takes for QA staff to enter the production site and be ready to obtain a sample.

HMAC Compaction

Compaction test results used for acceptance and price adjustment calculations are currently taken with calibrated nuclear gauges. Five "random" locations for every 1000 tons of material placed are tested, and then averaged for acceptance and price adjustment calculations. The random locations are generated by the Contractor using a correct procedure. However, a QC technician performing the testing can work with roller operators to achieve specification and consistent test results at each of the specific test locations, again, injecting the potential for bias. Independent compaction testing by ODOT staff alleviates some, but not all of this potential bias.

PROPOSAL

The QASC would like the support of CLT to pursue potential options for improving the confidence in the testing data being generated for acceptance of HMAC. Industry is likely to question and resist any changes to the existing system which is why we want to engage CLT at an early stage. QASC plans to have some detailed proposals for review by the end of 2015.

QASC will be looking into potential options and providing pros and cons to each. Options may include, but are not limited to:

HMAC Mixture

- Obtaining random samples at, or behind the paver rather than at the plant discharge.
- Having an ODOT representative at the plant site directing the Contractor as to which truck to sample.

Compaction

- Having an ODOT representative provide random testing locations after rolling is complete.
- Changing system to acceptance with cores by ODOT.
- Having ODOT take over compaction testing for acceptance and payment.

Thank you for your consideration. We look forward to working with you to improve the QA Program for HMAC.