

Oklahoma Department of Transportation

Use of Contractor's Test Results for Acceptance Purposes Construction Control Directive No. 20020215

February 29, 2016

Scope: To establish the procedure required to utilize the contractor's test results for acceptance purposes on construction contracts.

The Department/Residency maintains the responsibility to ensure that all materials used in the work are inspected and in conformity with the specifications. In order to accept the contractor's material test results, which will ultimately determine their pay, it is required that the Department statistically validate those results. All test results used for acceptance purposes (contractor, Residency and/or consultant) shall be documented in SiteManager in accordance with current policies and procedures. This action will ensure that the contractor is utilizing a qualified plant and lab, and certified materials technicians are performing the sampling and testing.

This process may be used for lots as defined in Percent-Within-Limits (PWL), Quality Control / Quality Acceptance (QC/QA), or standard 1,000 ton lots. When using the latter, for the purposes of the validations, designate 3-6 lots as if they were one pseudo lot with four being the usual "lot" size and size for initial validation for the purposes as detailed herein.

The statistical process to validate the contractor's material test results is attached to this Directive as Appendix A-D. The validation process consists of two parts:

Initial Validation: used to verify that the results from the Residency Lab and the Contractor Lab are in agreement. Compares split sample results using the Paired t-test statistical method. At least four split samples are required to perform the validation. If the initial validation passes, proceed with the on-going validation process.

On-going Validation: used to verify that the results from the Residency Lab and the Contractor Lab both accurately represent the material being produced and placed. After a successful initial validation, results are compared using the F-test & t-test statistical method.

Together, these two steps of the validation process compare the Department's results, which are considered valid, to the contractor's results.

If the contractor's test results have been validated by this process, those results may be used fully. If the contractor's test results are not used due to a failed comparison, the Department's test results must be used fully with no reduction in our test frequency.

Should the Residency office elect to use the contractor's test results for acceptance and payment purposes (lab-molded air voids, voids in the mineral aggregate (VMA), asphalt cement content, and roadway densities for example or, other combinations), the following procedure shall be used:

1. Samples of materials to be tested by the contractor and potentially used for acceptance purposes are to be split with the Residency. The Residency will compute the mixture and roadway core random sample locations in accordance with OHD L-55. The sampling and splitting process shall be performed by a certified technician. Residency personnel shall witness or participate in the sampling and splitting process. Each split sample received by the Residency shall be marked (tagged) with the sample ID, date, time, lot/sub-lot number and stored at the Residency office. Stored split samples may be discarded only after the contractor's test results are established as valid, and the lot is accepted by the Department with or without pay deductions and 15 days have expired after sharing of final test results with the contractor and no request for referee testing was received by the Residency.

The Residency may choose to use one or more of these split samples for their first validation check but cannot include the contractor's results for the same split sample. The Residency is not required to test a contractor's split sample and may elect to independently sample the material. A split of the independent sample may be shared with the contractor if requested.

The contractor will store their roadway cores with similar identification as the mixture samples. Typically each lab will have their own set of cores however the two parties may share the same roadways cores if they are not damaged during testing or transport, should either party wish to do so. The Residency will conduct the first tests on these cores. Handle roadway cores with care during transport to avoid

damage. The Residency may test cores independent of the contractor cores or elect to test all cores.

All samples and cores may be discarded only after the lot is accepted by the Department with or without pay deductions and 15 days have expired after sharing of final test results with the contractor and no request for referee testing was received by the Residency.

2. The contractor's tests must be performed by a certified technician in a qualified lab. The contractor's test results may be used for acceptance when:
 - a) the on-going validation shows agreement between the Residency and Contractor test results,
 - b) the contractor is actively adhering to his approved Quality Control Plan, if applicable, including maintaining up-to-date process control charts.
3. Conduct an initial validation using at least four samples that have been split and tested by the Residency and contractor's Lab. Samples may come from the first lot, control strips or plant startup testing. The test results shall be evaluated using the Paired-t statistical comparison procedure. If the initial evaluation does not pass, the Residency and Contractor shall work together to evaluate sampling/testing procedures and equipment to identify and resolve the source of the difference. If the initial validation passes, this indicates that the two labs are in agreement regarding testing procedures, proceed with the on-going validation described in step 4.

The initial validation must be completed in accordance with the instructions in Appendix A-D for this Directive, and by using the latest version of the associated Excel file located on the Materials & Research Division's Common Asphalt Files web site:

[http://www.ok.gov/odot/Doing_Business/Construction/Materials_& Testing_e-Guide/comm_asphss.html](http://www.ok.gov/odot/Doing_Business/Construction/Materials_&_Testing_e-Guide/comm_asphss.html)

4. After a successful initial validation as described in item 3 above, the Residency shall perform on-going validation of the contractor's and the Department's test results at a minimum frequency of twenty-five (25)

percent of the contractor's samples. The comparison shall be made using the F & t-test statistical process incorporating test results from samples representing permanent construction. To begin the F & t-test validation, there shall be at least three results from the Residency and three from the Contractor that are not from the same halves of split samples. It is not valid to utilize test results from both halves of a split sample in the F & t-test analysis. See the appendix for details on incorporating split samples into an F & t-test analysis. If during this comparison it is found that the contractor's results do not compare favorably, the Residency's test results shall be obtained from the stored split samples for the affected lot(s) and used for acceptance and payment purposes.

Use of the Residency's test results for acceptance and payment purposes shall continue until the contractor's test results can again be validated. As the project progresses and more test results are available from the Contractor and Residency, continue to validate the results using all available independent data. The accuracy of the validation process increases with increasing numbers of samples.

The on-going validation must be completed in accordance with the instructions in Appendix A-D for this Directive, and by using the latest version of the associated Excel file located on the Materials & Research Division's Common Asphalt Files web site:

[http://www.ok.gov/odot/Doing_Business/Construction/Materials_& Testing_e-Guide/comm_asphss.html](http://www.ok.gov/odot/Doing_Business/Construction/Materials_&_Testing_e-Guide/comm_asphss.html)

5. The on-going validation process should start anew anytime the contractor's results are found to be invalid, a change is made to the material (new mix design, change of material, etc.), or any other situation which may give the Residency reason to suspect that the contractor's test results do not accurately represent the quality of the material being placed. Engineering judgment should be utilized when evaluating the validation process. For example, if the contractor's results for asphalt cement content are determined to be invalid, the contractor's lab molded density results will likely be invalid as well.
6. The Residency and Contractor shall split and test samples with IAS personnel when requested.

It is the intent of this Directive that all parties responsible for Quality Assurance of construction materials (Contractor's QC, Residency, and Independent Assurance) communicate and coordinate their actions and efforts to ensure quality materials are utilized on the project. If the Residency is contemplating utilizing the contractor's test results, all of the conditions and procedures indicated in this Construction Control Directive shall be discussed with the contractor at the pre-construction conference.

If the Residency does not wish to use the contractor's test results for acceptance purposes under this procedure or, the Residency has determined that the contractor's test results are invalid, the Residency must commit to furnishing acceptance test results to the contractor within the second working day after the material is sampled. If this information is conveyed to the contractor by phone message or fax, it is strongly suggested that the date, time and contractor's contact person who received the test results be documented in the project records.



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