

## **Aggregate Imaging Measurement System Inter-Laboratory Study**

This document generally outlines the responsibilities of laboratories choosing to participate in the Inter-Laboratory Study (ILS) of the AFA2 Aggregate Imaging Measurement System (AIMS). This ILS will follow the guidelines of ASTM C802 “Standard Practice for Conducting an Inter-laboratory Test Program to Determine the Precision of Test Methods for Construction Materials” to evaluate the repeatability and reproducibility of the equipment and procedures for the AIMS system. This project is part of the Highways for Life program and is partially funded by the U.S. Department of Transportation Federal Highway Administration.

Each participating laboratory will be provided with the equipment and materials required for the experiment. While the AIMS system is designed to be easy to use, each laboratory will be required to spend some time familiarizing itself with the operation of the equipment and procedures. Operator manuals, setup instructions, and test procedures will be provided in advance so that each lab can be prepared when the equipment and sample materials arrive. Phone support will be available at Pine Instrument to answer questions. It is estimated that approximately 16-20 hours will be required for each lab to familiarize itself with the equipment and procedures, setup, operate, conduct the test for the ILS study, and then repackage the equipment for shipment.

Participants are encouraged to keep the equipment a day or two longer to test their own local aggregates. FHWA would assist the States compare and contrast local AIMS properties to other collected AIMS properties and relevant methodologies and specification in-practice. FHWA would also add the data to their database for future development of performance based aggregate specifications.

In general, each laboratory participating in this study will be responsible for the following:

1. Receiving and unpacking a crate weighing approximately 250 pounds (system and sample materials). At the conclusion of the work, each lab will repackage the system and materials. Shipping the equipment may be the responsibility of the participating laboratory and is estimated to be about \$250.
2. The AFA2A AIMS System is a computer operated bench top system represented in Figure 1. Each lab will be responsible for supplying appropriate bench space or a table roughly 30” x 60” and capable of supporting approximately 170 pounds. The system requires a 115v/60Hz/15A electrical source.
3. Minor assembly will be required. The microscope and camera system used on the AFA2A system are delicate and must be handled with care. As such they will be shipped in a protective box and must be assembled to the frame prior to system operating. Required tools and instruction will be provided.



4. It is estimated that setup of the system will take approximately 2 hours. Setup will include setting the main unit on the bench, assembling the optic system to the frame, placing the computer control on the bench, and connecting the system cables such as USB, Fire-wire, video, and power cords.
5. Because of transport, a system calibration will be required prior to operation. All calibration equipment and instructions will be provided.
6. Once the system has been checked out, the lab will then operate the system to characterize the material samples shipped with the unit. The operation of the system is semi automatic. The operator loads a sample tray with the material then starts the analysis routine. Each material characterization runs about 15 minutes, during which time the operator is then free to do other tasks. Once the cycle is complete, the operator removes the sample and places the next sample into the chamber and continues until all samples have been characterized. This is expected to take approximately 8 hours depending on the number of samples selected in the final experimental design. The data will be sent to the principle lab (Texas A&M) for analysis.
7. After the experiment materials have been analyzed, time will be allotted in the experiment schedule for each lab to analyze local materials, if desired.
8. After the sample material analysis is complete, the lab will repackage the system and sample materials for shipment to the next participating laboratory. It is estimated that packaging for shipment will take approximately 3 hours.
9. A questionnaire will be provided for each laboratory to comment on the equipment, operation, procedures, as well as its ILS participation experience.
10. Each lab will receive a copy of the final report.

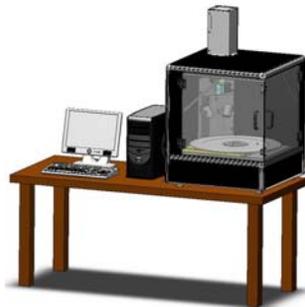


Figure 1: AFA2A Aggregate Image Measurement System (AIMS)

**If interested in participating in the ILS study, please contact:**

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