

# **Implementation Plan**

## **Soil Air Voids Method for Compaction Control**

The Materials Bureau of the Montana Department of Transportation contracted Bob Mokwa of Montana State University to investigate the Zero Air Voids method for grading compaction control. Concerns with the effectiveness and validity of this compaction control method were the reasons for conducting the study. These concerns were based on the theory behind the test method as well as instances where it has been reported that contractors “flood” the material to be tested in order to achieve a passing result.

The research indicates MDT is the only state using the soil air voids method for compaction control. It also showed there was little control over the moisture content and no maximum allowable water content. Instead the Department is relying on the fact an oversaturated soil will not support construction traffic and this fact will limit the amount of water contractors use for compaction. The report also points to the fact the correct specific gravities must be identified for each soil in order for the zero air voids method to be used properly.

The Department has not encountered widespread troubles with the use of the air voids method to date and some Districts are hesitant to discontinue the method's use. This report was distributed to the District Construction Engineers and District Materials Supervisors for their comments. Headquarters personnel also met with all of them at a joint meeting held October 5<sup>th</sup> to discuss the content of the report and the Zero Air Voids test methods future use. Several of the District representatives voiced their concerns with eliminating the methods use and pointed to the fact it has been successfully used for quit some time now with no documented failures directly attributable to the use of the Zero Air Voids for compaction control. They also felt requiring the use of proctors for all projects could potentially increase staffing needs.

The meeting also brought out the fact all Districts use the proctor method for compaction control to some degree so it would not require as extensive of training as if a new test method was being introduced. It was determined that the Zero Air Voids method is a proven tool for controlling compaction in instances when a proctor is not available or multiple materials are being mixed. The Materials Bureau will use this report in conjunction with the results of an ongoing study looking at the Department's Quality Assurance (QA)/ Quality Control (QC) program. The current compaction control specifications will be rewritten to reflect the findings of the two studies. It is anticipated this rewrite will reduce the use of the Zero Air Voids method of compaction control to instances when a proctor is not available or when an accurate proctor cannot be selected because of the mixing of materials.

