**DATE:** 09/25/2020  
**PROJECT AREA:** Materials

**TITLE:** Update to ARDOT Superpave Gyratory Specification to Increase Pavement Durability

**PROBLEM STATEMENT:**

The Superpave asphalt mixture design system was created as part of the Strategic Highway Research Program (SHRP) in the late 1980s-early 1990s. The centerpiece of the Superpave system is the use of the Superpave Gyratory Compactor (SGC) to compact asphalt specimens in the laboratory. Mixture design is controlled by a "design" number of gyrations in the SGC (called "Ndes"). Current specifications (AASHTO M323 and R35) include four compaction levels of Ndes (50, 75, 100, and 125). Numerous states have investigated the efficacy of Ndes specifications, noting that in many cases mixtures designed in accordance with M323/R35 can be harsh, hard to compact in the field, and brittle (due to insufficient binder in the mix) - and have subsequently reduced the Ndes levels to increase the durability of asphalt mixtures. This study proposes to evaluate current mix designs from Arkansas when reducing Ndes -- and examine the effect(s) on mixture durability (rutting and cracking performance). The proposed study is the next logical step in fully implementing a 'performance engineered mixture design' (PEMD) system for Arkansas.

**OBJECTIVES:**

The overall objective of the proposed research is to increase the durability of asphalt pavements. Specifically, this study will:

1. Determine the effect of reducing the number of design gyrations (Ndes) on the volumetric and performance properties of asphalt mixtures.
2. Estimate the impact of increasing the durability of asphalt mixtures on mixture design, construction, and subsequent performance and life-cycle of asphalt pavements.

**FORM OF RESEARCH IMPLEMENTATION AND RETURN ON INVESTMENT:**

Successful completion of the proposed research will result in recommended changes to asphalt mixture design specifications - for example, in the ARDOT Standard Specifications for Highway Construction, Sections 404, 407, 408, 409, and 410.

Increasing the durability of asphalt pavements will result in both a reduction in the extent of necessary maintenance, preservation, and rehabilitation efforts/costs, and in a longer pavement life (which will also significantly reduce the life-cycle costs of pavements).

**Estimated Project Duration:** 24 Months

**PREPARED BY:** Kevin D. Hall, Ph.D., P.E.

**AGENCY:** University of Arkansas

**PHONE:** (479) 640-2525  
**REVIEWER:** Mark Simecek, Robin Russell

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