

**ALDOT-382-94**

**MINING, STOCKPILING, SAMPLING, AND TESTING CARBONATE STONE FROM SINGLE OR MULTIPLE FORMATIONS/LEDGES FOR DETERMINATION OF BPN9 VALUES**

**1. Scope**

- 1.1. The purpose of this procedure is to establish a uniform set of guidelines necessary to establish British Polishing Numbers (BPN9) for carbonate stone and determine the extent to which different coarse carbonate stone will polish and to further determine the surface frictional properties of the carbonate stone.

**2. Referenced Standards**

- 2.1. ASTM D 3319, "Accelerated Polishing of Aggregate Using the British Wheel."
- 2.2. ASTM E 303, "Measuring Surface Frictional Properties Using the British Pendulum Tester."
- 2.3. AASHTO T 2, "Sampling Aggregates."
- 2.4. Alabama Department of Transportation Specifications.
- 2.5. ALDOT-175, "Method of Stockpiling Coarse Aggregate for All Purposes."
- 2.6. ALDOT-249, "Procedure for Acceptance of Fine and Coarse Aggregates."

**3. Calibration and Testing Procedure for British Polish and Pendulum Testing**

3.1. Pendulum Calibration

- 3.1.1. Two (2) sets of four (4) polish specimens each will be prepared and used to keep the British Pendulum Tester calibrated. The two (2) sets of specimens will have average BPN values of 20 and 35. At the beginning of each specimen fabrication-polishing-testing sequence for a set of 14 specimens, the calibration specimens will be tested. The British Pendulum Tester will be adjusted until the averages for each of the two (2) groups are within  $\pm$  one (1) unit from the established averages of 20 and 35.

3.2. Specimen Preparation and Polish Calibration

- 3.2.1. Polish specimens will be prepared in accordance with procedures contained in ASTM D 3319. A minimum of six (6) specimens will be prepared for each aggregate source.
- 3.2.2. A control sample (approximately 1800 lbs. (800 kg) of  $\frac{1}{2}$  in (12.5 mm) to  $\frac{3}{8}$  in. (9.5 mm) aggregate) has been obtained from Vulcan Materials Company, Calera, Alabama (ID Number 0155). The aggregate has been sieved, washed, dried, and stored in plastic lined barrels. This aggregate will be used to develop consistency in specimen preparation and polishing. Two (2) specimens will be prepared and included (with 12 others) in each run of the British Polish Wheel. The average of the two calibration specimens BPN0 values tested in accordance with section 3.3 will be within  $\pm$  two

(2.0) units of a bench mark BPN0 = 35 value. If this criteria is not met, all specimens prepared for the polish sequence will be discarded and new specimens prepared.

- 3.2.3. After polishing for nine (9) hours, the BPN9 values for the two calibration specimens will be measured in accordance with section 3.3. The average BPN9 value will be within  $\pm$  one and one-half (1.5) units of the benchmark BPN9 = 25 value. If only one (1) calibration specimen survives the nine (9) hour polishing sequence it will be within  $\pm$  two and one-half (2.5) units of the bench mark BPN9 = 25 value. If these criteria are not met, the results from the polish testing sequence will not be used. The fabrication-polishing-testing sequence for the complete wheel of 14 specimens will be repeated until the criteria for the calibration specimens are met.
- 3.2.4. Control charts will be prepared and maintained for calibration BPN0, and BPN9 values. The average of the two (2) values for each run will be plotted with bench mark values of BPN0, and BPN9.

### 3.3. Pendulum Testing and Reporting

- 3.3.1. Specimens will be tested according to procedures outlined in ASTM E 303. Broken specimens and specimens with stones missing in the slider or contact area will be discarded.
- 3.3.2. The reported values of BPN0 and BPN9 for any aggregate will be the average from a minimum of four (4) samples.

## 4. Sampling (Single Formations)

- 4.1. The producer shall construct stockpiles in accordance with ALDOT-175, "Method of Stockpiling Coarse Aggregate for All Purposes." Samples shall be taken in accordance with AASHTO T 2, "Sampling Aggregates."
- 4.2. After samples have been taken, tests shall be performed as per this procedure and BPN9 values established.

## 5. Sampling (Multiple Formations)

- 5.1. If a source contains multiple formations and the producer desires to mine each formation independently of the other, separate stockpiles shall be constructed for each formation in accordance with ALDOT-175. BPN9 values will be established for each different formation stockpile. The producer will be required to physically identify each stockpile as to the appropriate formation from which the material was taken. Stockpile identifiers must be used when shipping.
- 5.2. If the producer cannot or desires not to mine each formation independently of the others, conglomerate stockpiles may be constructed in accordance with ALDOT-175.

- 5.2.1. The producer will assist the Department in obtaining representative samples from each formation. BPN9 numbers will be established for each formation; however, the lowest BPN9 number will be assigned to the conglomerate stockpile.

## **6. Requirements**

- 6.1. All producers of carbonate stone, that sell same for use on Department projects, must be an approved source meeting all requirements of ALDOT-249, "Procedure for Acceptance of Fine and Coarse Aggregates." New BPN9 values will be determined annually on each approved carbonate stone source. All sampling and testing for BPN9 values will be performed by Central Laboratory personnel.