Test Procedure for

DETERMINING DELETERIOUS MATERIAL IN MINERAL AGGREGATE

TxDOT Designation: Tex-413-A

Effective Date: August 1999

1. SCOPE

1.1 Use this method to determine the percentage, by weight, of deleterious material in mineral aggregates.

1.2 The values given in parentheses (if provided) are not standard and may not be exact mathematical conversions. Use each system of units separately. Combining values from the two systems may result in nonconformance with the standard.

2. DEFINITION

2.1 *Deleterious Material*—clay lumps, shale, soft, friable, or laminated particles, vegetable matter, or other objectionable material.

3. APPARATUS

3.1 *Balance,* Class G2 in accordance with Tex-901-K, minimum capacity of 4000 g.

3.2 *Drying oven,* maintained at 110 ± 5°C (230 ± 9°F).

3.3 *Pan.*

3.4 *Small spatula,* having a blade 101 mm (4 in.) long and 19.1 mm (3/4 in.) wide.

3.5 *Sample splitter, quartering cloth, or quartering machine.*

3.6 *Standard U.S. sieve,* 4.75 mm (No. 4).

4. PROCEDURE

4.1 Carefully quarter the processed aggregate.

4.2 Sieve the material over a 4.75 mm (No. 4) sieve. If this test is a single determination, discard the material passing the 4.75 mm (No. 4) sieve. If a determination is needed for

fine aggregate, keep the material passing the No. 4 sieve and retained on the No. 16 sieve and test in accordance with ASTM C 142.

4.3 Obtain a sample of approximately 3000 g from the material retained on the 4.75 mm (No. 4) sieve.

4.4 Dry the aggregate to a constant mass in the oven.

4.5 Weigh and record the dry mass to the nearest gram as W_T under Section 5.

4.6 Spread the sample out on a workspace large enough to inspect all of the particles easily. Use the edge of a spatula to separate particles of deleterious materials from the remainder of the sample by sliding them off into separate piles according to type of deleterious material.

4.7 Weigh the various individual fractions of deleterious material to the nearest gram and record as:

- W_1 = mass of clay lumps
- W_2 = mass of shale
- W_3 = mass of soft or friable particles
- W_4 = mass of laminated particles.

Note 1—Break friable particles by squeezing and rolling them between the thumb and forefinger. Do not use fingernails or press them against a hard surface.

5. CALCULATIONS

5.1 Using the total sample weight from Section 4.5 and the masses of the piles of deleterious material from Section 4.7, calculate the percent of deleterious material in aggregate:

$$Percent\ \ Deleterious = 100\ (W_1 + W_2 + W_3 + W_4\ ) / W_T$$

Where:

W_T = mass of total test sample

$W_{1–4}$ = individual fractions of deleterious material.

6. REPORTING

6.1 Report the percentage of deleterious material to the nearest 0.1%.

Note 2—When the specification indicates a maximum allowable for an individual fraction, use appropriate $W \times 100$ divided by W_T.