

ALDOT-310
METHOD OF DETERMINING PERCENT OF FRACTURED PARTICLES IN COARSE
AGGREGATE

1. Scope

- 1.1. This method of test is for the determination of the percent of crushed particles in coarse aggregate.

2. Definitions and Standards

- 2.1. A fully fractured face is defined as an angular, rough or broken surface of an aggregate particle created by crushing, by other artificial means, or by nature. A face is considered fractured only if it has a projected area at least as large as one-quarter of the maximum projected area (maximum cross-sectional area) of the particle and also has sharp and well-defined edges.

3. Apparatus

- 3.1. Balances (Accurate to 0.1 g).
- 3.2. Oven (Capable of maintaining the temperature at $230 \pm 10^{\circ}\text{F}$ ($110 \pm 5^{\circ}\text{C}$)).
- 3.3. No. 4 (75 mm) Sieve.
- 3.4. Pans.

4. Procedure

- 4.1. Determine sample size based on Nominal Maximum Aggregate size as per AASHTO T-27.
- 4.2. Thoroughly mix and then reduce the field sample for testing in accordance with AASHTO T-248.
- 4.3. Wash the sample thoroughly over the No. 4 (4.75 mm) sieve.
- 4.4. Dry the sample at $230 \pm 10^{\circ}\text{F}$ ($110 \pm 5^{\circ}\text{C}$) and record total mass of sample.
- 4.5. Separate the aggregate particles into three groups: (1) one crushed face, (2) two or more crushed faces, and (3) what remains with no crushed faces. To check this criterion (as defined in 2.1), hold each aggregate particle so that the face is viewed directly. See Figure 1 showing a schematic of a fractured particle with one fractured face.
- 4.6. Record the mass of each of these groups and the total sample mass to the nearest 0.1g.
- 4.7. Check total sample mass after the test with the mass recorded in 4.4. If different by more than 0.1g repeat test.

5. Calculations

- 5.1. Percent particles with two or more crushed faces.
- 5.2. Where: M_{c2} is the mass of particles with two or more crushed faces, and M is the mass of the total sample.
- 5.3. Percent of particles with one or more crushed faces.
- 5.4. Where: M_{c1} is the mass of particles with one or more crushed faces.

Note: Because % M_{c1} is percentage of particles with one or more crushed faces, M_{c1} will be the sum mass of all particles with one crushed face plus all particles with two or more crushed faces.

6. Reporting

- 6.1. Results should be reported to the nearest percent of crushed aggregate.

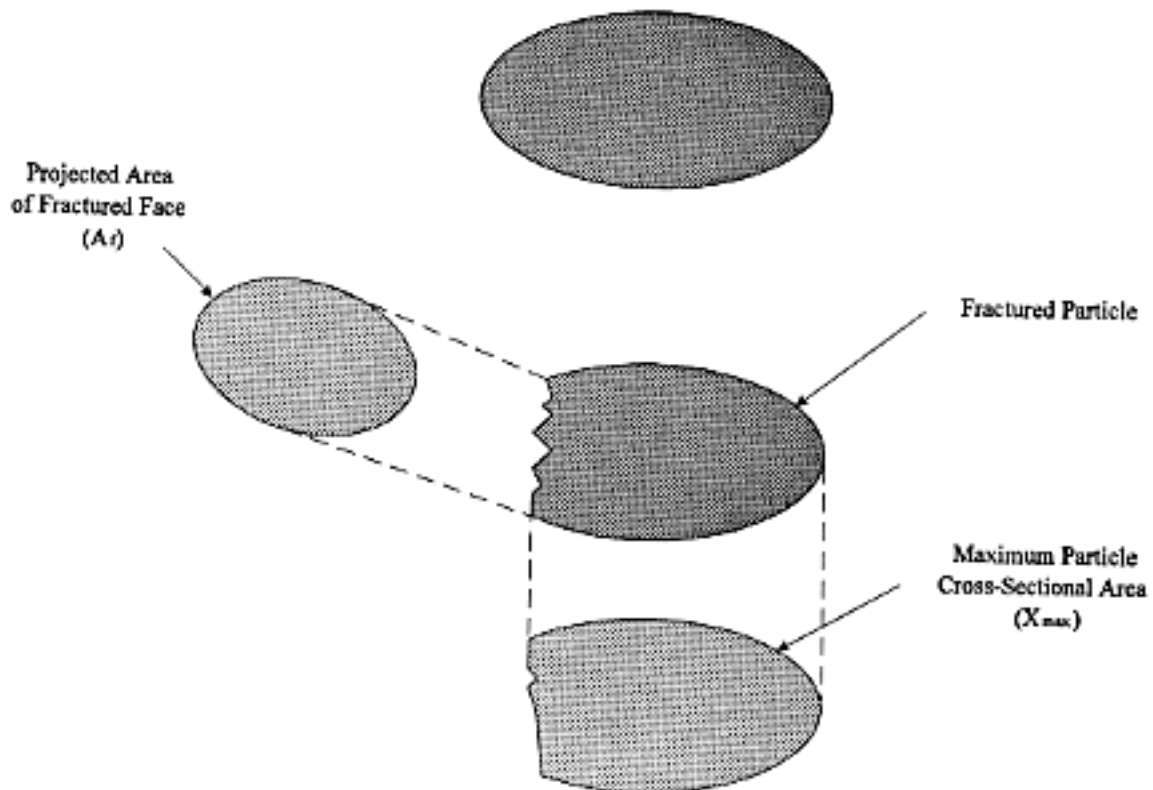


Figure 1
Schematic of a Fractured Particle with One Fractured Face