

MATERIALS DIVISION

 Virginia Department of Transportation
MEMORANDUM

GENERAL SUBJECT: Frequency of Aggregate Quality Testing		NUMBER: MD 320-09
SPECIFIC SUBJECT: Sections 204.02(b) and 204.22 (c)(6)		DATE: July 30, 2009
DIRECTED TO: District Administrators	SIGNATURE: Charles A. Babish, P.E. State Materials Engineer <i>Signature on original copy of memorandum</i>	

This memorandum allows for the reduction in aggregate quality testing for reapproval of aggregate sources based on historical aggregate quality test values and testing variability for test methods AASHTO T104 (Soundness of Aggregate by Use of Magnesium Sulfate) and AASHTO T96 (Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine).

Amend Section 204.02(b) paragraph one to read:

Common courtesy dictates that the Department representative, always announce his presence to a company representative. In addition, Mine Safety and Health Administration Regulations require each plant to have explicit safety rules that may not be waived. Usually, this means visits to the pit or quarry face must include accompaniment by *an aggregate producer's company* designated official. These company safety rules must be strictly followed and violation by Department employees could result in administrative action.

The source of aggregates must be reapproved *in accordance with the timeframes set forth in the appropriate tables below* ~~biennially~~ by the Materials Division/Section for quality or at any other such time that the material quality appears to have changed *as deemed necessary by the Department*. Sampling for quality will be performed by the District Materials Engineer. (See lists in Sec. 209.)

The District monitoring the aggregate source will determine the sampling frequency needed and coordinate the sampling schedule with the Regional or contract testing laboratory. Alternatively, the monitoring District may request that the Regional Lab develop the sampling schedule.

Note that the frequency of testing is determined by using the latest (historical or previous) tested value with the appropriate specification (spec) limit.

If sufficient testing data exists on a given aggregate quality property, the following methodology may be used to determine the frequency of test.

1. Compute the standard deviation using the tested values.
2. Develop a frequency of testing chart using the following criteria:

SL = Specification Limit
SD = one Standard Deviation

$A = [SL - (SD \times SL)]$
 $C = [A - (SD \times A)]$
 $E = [C - (SD \times C)]$
 $G = [E - (SD \times E)]$

Round A, C, E and G to the nearest tenth, then

$B = A - 0.1$
 $D = C - 0.1$
 $F = E - 0.1$
 $H = G - 0.1$

0 to H	5 years
G to F	4 years
E to D	3 years
C to B	2 years
A to SL	1 year

Otherwise, the charts below are used to determine testing frequency. The charts are based upon the d_{2s} value for the test method. To develop a chart, a standard deviation was approximated from the d_{2s} value. The method documented above was used to generate the chart. Numbers generated for the chart were adjusted to facilitate ease of use.

Fine Aggregate Quality

AASHTO T104 – Soundness of Aggregate by Use of Magnesium Sulfate

Hydraulic cement concrete Spec Limit maximum 18% loss

0.0 to 6.0	5 years
6.1 to 8.0	4 years
8.1 to 11.0	3 years
11.1 to 14.0	2 years
14.1 to 18	1 year

Bituminous Fine Aggregate Quality

Asphalt concrete surfaces and surface treatments **Spec Limit maximum 25% loss**

0.0 to 10.0 5 years
10.1 to 13.0 4 years
13.1 to 16.0 3 years
16.1 to 20.0 2 years
20.1 to 25 1 year

Asphalt concrete bases **Spec Limit maximum 30% loss**

0.0 to 13.0 5 years
13.1 to 17.0 4 years
17.1 to 21.0 3 years
21.1 to 25.0 2 years
25.1 to 30 1 year

Coarse Aggregate Quality

AASHTO T104 – Soundness of Aggregate by Use of Magnesium Sulfate

Hydraulic cement concrete **Spec Limit maximum 12% loss**

0.0 to 4.0 5 years
4.1 to 6.0 4 years
6.1 to 8.0 3 years
8.1 to 10.0 2 years
10.1 to 12 1 year

Asphalt surface courses **Spec Limit maximum 15% loss**

0.0 to 5.0 5 years
5.1 to 7.5 4 years
7.6 to 10.0 3 years
10.1 to 12.5 2 years
12.6 to 15 1 year

Asphalt and aggregate bases **Spec Limit maximum 20% loss**

0.0 to 8.0 5 years
8.1 to 11.0 4 years
11.1 to 14.0 3 years
14.1 to 17.0 2 years
17.1 to 20 1 year

Select material (Type I) **Spec Limit maximum 30% loss**

and subbase

0.0 to 16.0	5 years
16.1 to 19.0	4 years
19.1 to 22.0	3 years
22.1 to 26.0	2 years
26.1 to 30	1 year

AASHTO T 96 (500 revolutions) – Coarse Aggregate L.A. Abrasion

Grade A stone

Spec Limit maximum 40% loss

0.0 to 20.0	5 years
20.1 to 25.0	4 years
25.1 to 30.0	3 years
30.1 to 35.0	2 years
35.1 to 40	1 year

Grade B stone
Slag and Gravel

Spec Limit maximum 45% loss

0.0 to 22.0	5 years
22.1 to 28.0	4 years
28.1 to 34.0	3 years
34.1 to 39.0	2 years
39.1 to 45	1 year

Grade C Stone

Spec Limit maximum 50% loss

0.0 to 24.0	5 years
24.1 to 31.0	4 years
31.1 to 38.0	3 years
38.1 to 44.0	2 years
44.1 to 50	1 year

Amend Section 204.22(c)6 paragraph one to read:

~~Annual~~ Quality testing will be performed by the Department for establishing quality of raw materials *as deemed necessary by the Materials Engineer*. The tests will be performed on the aggregates, cement, mineral admixtures, and all types and sizes of reinforcing materials.

cy: Commissioner
Chief Engineer
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District Maintenance Engineers
Area Construction Engineers
Virginia Asphalt Association

Virginia Transportation Research Council
Virginia Ready-Mixed Concrete Association
Precast Concrete Association of Virginia
Virginia Transportation Construction Alliance
Virginia Dept. of Minority Business Enterprise
Federal Highway Administration
American Concrete Paving Association
NE Chapter, Southern Region
Old Dominion Highway Contractors Association