

WSDOT Standard Practice QC 11

Standard Practice for Aggregate Producers Participating in the Quality Aggregate Program

1. Scope

The standard specifies the minimum requirements and procedures for Quality Control Programs for the production of aggregates. This standard may involve hazardous, operations and equipment. It does not address all of the safety problems associated with their use. It is the responsibility of those using this standard to consult and establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use.

2. Referenced Documents

2.1 AASHTO Standards

- 2.1.1 M 6 Standard Specification for Fine Aggregate for Hydraulic Cement Concrete
- 2.1.2 M 80 Standard Specification for Coarse Aggregate for Hydraulic Cement Concrete
- 2.1.3 R 18 Standard Recommended Practice for Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
- 2.1.4 T 2 Standard Method of Test for Sampling of Aggregates
- 2.1.5 T 11 Standard Method of Test for Materials Finer Than 75- μ m (No. 200) Sieve in Mineral Aggregates by Washing
- 2.1.6 T 27 Standard Method of Test for Sieve Analysis of Fine and Coarse Aggregate
- 2.1.7 T 84 Standard Method of Test for Specific Gravity and Absorption of Fine Aggregate
- 2.1.8 T 85 Standard Method of Test for Specific Gravity and Absorption of Coarse Aggregate
- 2.1.9 T 176 Standard Method of Test for Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test T 96 Standard Method of Test for Resistance to Degradation of Small-Size Coarse
- 2.1.10 Aggregate by Abrasion and Impact in the Los Angeles Machine
- 2.1.11 T 304 Standard Method of Test for Uncompacted Void Content of Fine Aggregate
- 2.1.12 T 335 Standard Method of Test for Determining the Percentage of Fracture in Coarse Aggregate

2.2 ASTM Standards

- 2.2.1 C 1567 Standard Test Method for Determining the Potential Alkali-Silica Reactivity of Combinations of Cementitious Materials and Aggregate (Accelerated Mortar-Bar Method)
- 2.2.2 C 1293 Standard Test Method for Determination of Length Change of Concrete Due to Alkali-Silica Reaction

2.3 WSDOT Standards

- 2.3.1 M 41-10 *Standard Specifications for Road, Bridge, and Municipal Construction*
- 2.3.2 M 46-01 *Materials Manual*

3. Terminology

- 3.1 **AASHTO** – American Association of State Highway and Transportation Officials
- 3.2 **ACI** – American Concrete Institute
- 3.3 **AgTT** – WAQTC certified Aggregate Testing Technicians
- 3.4 **Department** – The Washington State Department of Transportation
- 3.5 **FOP** – Field Operating Procedure (located in *Materials Manual*)
- 3.6 **QAP** – WSDOT Quality Aggregates Program
- 3.7 **QC** – Quality Control
- 3.8 **QCP** – Quality Control Plan
- 3.9 **WAQTC** – Western Alliance for Quality Transportation Construction

4. Significance and Use

- 4.1 This standard specifies requirements and procedures to be part of the Department Quality Aggregates Program. This QAP is a series of procedures performed to produce quality aggregates by the aggregate producer in compliance with their Quality Control Plan.

5. Testing Requirements

- 5.1 Each aggregate source must designate either its own personnel or a commercial laboratory for the performance of QC testing. QC testing being performed for submittal to WSDOT must be equipped to run all applicable tests with equipment and technicians meeting the following requirements:
 - 5.1.1 All Materials testers shall be either WAQTC certified Aggregate Testing Technicians (AgTT), ACI Aggregate Testing Technician level 1 and 2 , as appropriate, or work for an AASHTO Accreditation Laboratory with a scope of Aggregates.

- 5.1.2 The QC testing equipment shall be calibrated/standardized/checked in accordance with the test procedure, appropriate sections of AASHTO R 18 and AASHTO R 61.
- 5.1.3 Documentation of personnel qualifications and the equipment certification/standardization/checked records shall be maintained and available for inspection by the Department, within one day of notification.

6. Quality Control Plan Requirements

6.1 Identification of the Physical Location of Aggregate Source

The identification of the physical location of the aggregate source shall include the following:

- Address of the site
- Township, range, and section, longitude and latitude
- Reference the nearest identifiable points such as highways and towns in order to find the location easily by public roadway from the State Materials Laboratory, Tumwater, WA

6.2 Analysis and Recording of Data

The QCP shall include a procedure that will review and analyze its QC test data, such as control charts, in order to effectively evaluate the control of the process. The producer shall monitor its own data for compliance with the current WSDOT *Standard Specifications*. When the test results do not meet department specifications, the producer shall immediately take necessary steps to adjust processes and retest materials to verify materials meet WSDOT specifications.

6.3 Responsibilities of Personnel

The QCP shall list contact(s) name(s) and phone number(s) responsible for the management of the QCP. A copy of the QCP will be available upon request by the contracting agency. The Aggregate QC Manager must have full authority to act as the aggregate source(s)' agent to institute all action necessary for the successful implementation of the QCP.

6.4 QC Tests - The minimum QC testing frequency is shown in Table 1:

General Testing

All Aggregates	
Test Method	Frequency
Specific Gravity - FOP for AASHTO T 85	Once every 3 months
Los Angeles Wear - AASHTO T 96	Once every 2½ years

Additional Aggregate Specific Testing

Concrete Aggregates 9-03.1	
Test Method	Frequency
Gradation-FOP for AASHTO T 27 - T 11	Once every 3 months

Aggregates for Bituminous Surface Treatment 9-03.4	
Test Method	Frequency
Gradation- FOP for AASHTO T 27 - T 11	Once every 3 months
Fracture-FOP for AASHTO T 335	Once every 3 months

Aggregates for HMA 9-03.8	
Test Method	Frequency
Gradation-FOP for AASHTO T 27 - T 11	Once every 3 months
SE-FOP for AASHTO T 176	Once every 3 months
Fracture-FOP for AASHTO T 335	Once every 3 months
Uncompacted Voids-FOP for AASHTO T 304	Once every 3 months

Aggregates for Ballast 9-03.9(1)	
Test Method	Frequency
Gradation-FOP for AASHTO T 27 - T 11	Once every 3 months
SE-FOP for AASHTO T 176	Once every 3 months
Dust Ratio: $\frac{\% \text{ Passing No. 200}}{\% \text{ Passing No. 40}}$	Once every 3 months

Aggregates for Permeable Ballast 9-03.9(1) & 9-03.9(2)	
Test Method	Frequency
Gradation- FOP for AASHTO T 27 - T 11	Once every 3 months
Fracture-FOP for AASHTO T 335	Once every 3 months

Crushed Surfacing 9-03.9(3)	
Test Method	Frequency
Gradation-FOP for AASHTO T 27 - T 11	Once every 3 months
SE-FOP for AASHTO T 176	Once every 3 months
Fracture-FOP for AASHTO T 335	Once every 3 months

Gravel Backfill for Structural Earth Walls 9-03.14(4)	
Test Method	Frequency
Gradation-FOP for AASHTO T 27 - T 11	Once every 3 months
SE-FOP for AASHTO T 176	Once every 3 months
Resistivity-WSDOT T 417	Once every 3 months
pH-WSDOT T 417	Once every 3 months
Chlorides*-AASHTO T 291	Once every 3 months
Sulfates*-AASHTO T 290	Once every 3 months

*If the resistivity of the gravel borrow equals or exceeds 5000 ohm-cm, the specified chloride and sulfate tests are not required.