



## WSDOT Standard Practice QC 10

### *Standard Practice for Approval of Recycled Materials Facilities from Stockpiles of Unknown Sources*

#### 1. Scope

This standard specifies the requirements for all Recycled Materials Stockpiles for recycled materials identified in Section 9-03.21 of the *Standard Specifications* from unknown sources. Recycled Materials Facilities that comply with this standard will require evaluation of LA Wear, Modified WSDOT Degradation test, and certification of toxicity characteristics.

This standard may involve hazardous materials, operations and equipment. It does not address all of the safety problems 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. Reference Documents

##### 2.1 AASHTO Standards

- 2.1.1 M 80 Standard Specification for Coarse Aggregate for Hydraulic Cement Concrete
- 2.1.2 R 18 Standard Recommended Practice for Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories
- 2.1.3 R 76 Reducing Samples of Aggregate to Testing Size
- 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- $\mu\text{m}$  (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 96 Standard Method of Test for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine
- 2.1.10 T 176 Standard Method of Test for Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test
- 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 D 75 Standard Practice for Sampling Aggregates

2.2.2 C 117 Standard Test Method for Materials Fine than 75- $\mu$ m (No. 200) Sieve in Mineral Aggregates by Washing

2.2.3 C 127 Standard Test Method for Relative Density (Specific Gravity) and Absorption of Coarse Aggregate

2.2.4 C 128 Standard Test Method for Relative Density (Specific Gravity) and Absorption of Fine Aggregate

2.2.5 C 131 Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine

2.2.6 C 136 Standard Test Method for Sieve Analysis of Fine and Coarse Aggregate

## 2.3 WAQTC Standards

2.3.1 FOP for AASHTO T 2, Sampling Aggregates

2.3.2 FOP for AASHTO T 27\_T11, Sieve Analysis of Fine and Coarse Aggregate

2.3.3 FOP for AASHTO R 76, Reducing Samples of Aggregates to Testing Size

2.3.4 FOP for AASHTO T 85, Specific Gravity and Absorption of Coarse Aggregate

2.3.5 FOP for AASHTO T 176, Plastic Fines in Graded Aggregates and Soils by Use of the Sand Equivalent Test

2.3.6 FOP for AASHTO T 335, Determining the Percentage of Fracture in Coarse Aggregate

## 2.4 WSDOT Standards

2.4.1 M 41-01 *Construction Manual*

2.4.2 M 41-10 *Standard Specifications for Road, Bridge, and Municipal Construction*

2.4.3 M 46-01 *Materials Manual*

2.4.4 WSDOT Test Method T 113 Method of Test for Determination of Degradation Value

2.4.5 WSDOT Test Method T 304 FOP for Uncompacted Void Content of Fine Aggregate

2.4.6 WSDOT QC 3 Quality System Laboratory Review

## 3. Terminology

3.1 AASHTO – American Association of State Highway and Transportation Officials

3.2 ACI – American Concrete Institute

3.3 ASTM – American Society of Testing and Materials

3.4 ASA Database – The ASA (Aggregate Source Approval) is a database containing results of WSDOT preliminary testing of aggregate sources

3.5 Modified Degradation Test- WSDOT Test Method T 113 run with  $\frac{1}{2}$  -  $\frac{3}{8}$  inch and  $\frac{3}{8}$  -  $\frac{1}{4}$  inch portions in step g and replacing the  $\frac{1}{4}$  - #10 portion with  $\frac{1}{4}$  - #4 material of the Recycled Concrete Aggregate

- 3.6 Stockpiles – stockpiles that are composed recycled concrete from which aggregate sources are unknown
- 3.7 QC – Quality Control, the Recycled Materials Facility’s operational techniques and activities that are performed or conducted to fulfill specification compliance
- 3.8 QCP – Quality Control Plan
- 3.9 QPL – Washington State Department of Transportation, Qualified Products List
- 3.10 Recycling Materials Facility – The facility and location of the plant that produces recycled materials
- 3.11 WAQTC – Western Alliance for Quality Transportation Construction
- 3.12 WSDOT – Washington State Department of Transportation

#### 4. Significance and Use

This standard practice specifies processes for approving Recycling Materials Facilities. This is accomplished by a system that evaluates the quality control processes of Recycling Materials Facilities and determines if these quality control processes will ensure that non- contaminated quality materials are produced to meet the specified materials quality.

#### 5. Recycled Materials Quality Control Plan

The Recycling Materials Facility shall have QCP on how the facility will ensure that required quality levels are obtained. This QCP should at the minimum include following;

##### 5.1 Recycling Materials Facility

###### 5.1.1 Facility Type

###### 5.1.2 Facility Address

5.1.3 Name, email address, and telephone number of the contact person responsible for the quality control of the facility.

##### 5.2 Prevention of Contamination, Segregation, and Degradation

The handling and storage of recycled materials shall be in such manner to minimize any segregation or degradation and to prevent contamination by foreign materials or deleterious materials in accordance with Section 9-03 of the *Standard Specifications*.

5.2.1 Identify what processes will be used to ensure that no contamination will occur with other materials.

5.2.2 A new QCP shall be required whenever changes occur that causes the existing QCP to become inaccurate or invalid.

5.2.3 In order to ensure these quality control plans are occurring, WSDOT reserves the right to visit these facilities with a one day notice to ensure the Recycling Materials facility is following their approved quality control plans and perform sampling and testing.

5.3 Testing Requirements

5.3.1 Each Recycling Materials Facility must designate either its own personal or a commercial laboratory for the performance of QC testing. QC testing facility and personnel performing test for submittal to WSDOT must be equipped to run all applicable tests with equipment and technicians meeting the following requirements:

5.3.1.1 Materials testers shall be either WAQTC certified Aggregate Testing Technicians (AgTT) or ACI Aggregate Testing Technician level 1 and 2, as appropriate.

5.3.1.2 The QC laboratory and testing equipment shall be compliant with WSDOT QC 3 “Standard Practice for Quality System Laboratory Review” or hold a current AASHTO Accreditation with a scope of Aggregates.

5.3.2 Documentation of personnel qualifications and the equipment certification/standardization/checked records shall be maintained and available for inspection.

5.4 Analysis and Recording of Data

5.4.1 The QCP shall include a procedure that will review and analyze test data, so as to effectively evaluate control of the process.

5.4.2 The producer shall monitor its own data for compliance with the current Washington State Department of Transportation *Standard Specifications*. When there is an indication that the process is not being adequately controlled in compliance with the QCP, the producer shall immediately take the necessary steps to adjust the process

5.5 QC Tests

The maximum QC testing frequency is shown in Table 1:

**Table 1** Minimum Quality Control testing

<b>All Aggregates per Standard Specification 9-03</b>	
<b>Test</b>	<b>Frequency</b>
Toxicity per 9-03.21(1)	Once every 90 days
Modified Degradation	Once every 3 Months
SPG	Once every 3 Months
Absorption	Once every 3 Months
LA wear	Once every 3 Months
Gradation	Once every 10,000 tons
SE	Once every 10,000 tons
Dust Ratio	Once every 10,000 tons

The QCP may utilize other testing frequencies, but shall not exceed the frequencies shown in Table 1.

## 6. Documentation Requirements

A manufacturer's certification compliance in accordance with Section 1-06.3 of the WSDOT *Standard Specifications* shall be provide to Project Engineer. This certification shall represent a lot of processed recycled materials, not to exceed the frequencies shown in Table 1. The manufacture's certification of compliance shall be in English and include the following;

- 6.1 Name of Recycling Materials Facility
- 6.2 WSDOT Standard Specification that the recycled aggregate meets
- 6.3 Quantity of recycled material
- 6.4 Identify the percentage(s) of recycled materials and natural aggregate in the final blended aggregate product
- 6.5 Unique identification number traceable to the production dates of the recycled materials
- 6.6 Certification shall be provided for each lot of recycled materials, with the maximum lot size not exceeding 10,000 tons
- 6.7 Copy of test reports for items listed in Table 1 for each lot , including most current toxicity test, Modified WSDOT Degradation, LA wear test, Specific Gravity and Absorption results

## 7. Revocation of Qualifications

- 7.1 A Recycling Materials Facility may have its qualification status revoked and be removed from the QPL if found in non-conformance with the Standard Specification or this Standard. Causes for removal from the QPL may include, but are not limited to, the following;
  - 7.1.1 Failure to comply with the requirements of this Standard Practice
  - 7.1.2 Failure to notify WSDOT of changes in QC plan
  - 7.1.3 Producing materials that fails to meet specification requirements

## 8. Requalification

- 8.1 Once a Recycling Materials Facility has been removed from the QPL, the Recycling Materials Facility may request reinstatement by providing the following written information to WSDOT:
  - 8.1.1 The root cause and corrective action taken to prevent future occurrences of the problem that cause removal from the QPL
  - 8.1.2 Updated QCP
  - 8.1.3 Other information and test data as determined by WSDOT
- 8.2 Provided there is a satisfactory resolution of the initial problem, at WSDOT's discretion, the Recycling Materials Facility may either be reinstated into the QPL, or the Recycling Materials Facility may be required to reapply to the QPL. All costs of the QPL process shall be borne by the Recycling Materials Facility.

