



WSDOT Standard Practice QC 5

Standard Practice for Ground Granulated Blast-Furnace Slag Producers/Suppliers That Certify Ground Granulated Blast-Furnace Slag

1. Scope

This standard specifies requirements for all producers/suppliers of ground granulated blast-furnace slag.

This standard may involve hazardous materials, 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

M 302 Standard Specifications for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars

R 18 Establishing and Implementing a Quality Management System for Construction Materials Testing Laboratories

2.2 ASTM Standards

C989 Standard Specifications for Ground Granulated Blast-Furnace Slag for Use in Concrete and Mortars

2.3 WSDOT Standards and Documents

Current WSDOT [Standard Specifications](#) M 41-10

Current WSDOT [Qualified Products List](#)

3. Terminology

3.1 **AASHTO** – American Association of State Highway and Transportation Officials

3.2 **ASTM** – American Society of Testing and Materials

3.3 **CCRL** – Cement and Concrete Reference Laboratory

3.4 **WSDOT** – Washington State Department of Transportation: the agency responsible for the final acceptance of ground granulated blast-furnace slag.

- 3.5 **QPL** – Qualified Products List
- 3.6 **Producer** – A production facility that has the capacity for producing and/or grinding ground granulated blast-furnace slag that meets the requirements of the [Standard Specifications](#) Section 9-23.10.
- 3.7 **Supplier** – A supplier stores and then delivers ground granulated blast-furnace slag produced by another entity to a concrete plant or another supplier.
- 3.8 **Supplier Certification** – Certification of ground granulated blast-furnace slag provided by the supplier or importer using representative test results obtained in accordance with an agency approved QC plan and approved testing lab.
- 3.9 **Quality Management Plan** – The producer/supplier plan to ensure that the ground granulated blast-furnace slag meets the specification requirements through a systematic program of sampling, testing, and inspection.
- 3.10 **Specification Compliance Testing** – Complete testing in accordance with the specification requirements for the material identified.
- 3.11 **Quality Control Testing** – Testing performed per the producer/supplier quality management plan to evaluate the production process.
- 3.12 **CAP** – Cement Acceptance Program
- 3.13 **Manufacturer’s Certification (Mill Test Report)** – A document provided by the producer/supplier showing the physical and chemical test results with specification limits for each property tested on the GGBFS.
- 3.14 **Ground granulated blast-furnace slag** – Ground granulated blast-furnace slag (GGBFS) meeting the requirements of [Standard Specifications](#) Section 9-23.10.
- 3.15 **No Production Report** – A document provided to WSDOT when ground granulated blast-furnace slag was not produced or shipped during a given month.

4. Significance and Use

This standard specifies procedures for accepting ground granulated blast-furnace slag. This is accomplished by the cement acceptance program that evaluates quality control and specification compliance tests performed by the producers/suppliers according to their quality management plan. Products determined to meet the requirements of this standard are eligible for listing on the WSDOT Qualified Products List (QPL).

5. Laboratory and Tester Requirements

The producers/suppliers testing laboratory used to conduct specification compliance testing for the quality management program shall be an AASHTO accredited laboratory and shall maintain AASHTO accreditation while participating in the WSDOT CAP program. Only laboratories that are participants in the CCRL on-site inspection and proficiency sample program and are accredited from the AASHTO Accreditation Program (AAP) are recognized as approved laboratories for the program.

6. Qualification of Producers/Suppliers

- 6.1 Producers/suppliers shall submit a written request to WSDOT for acceptance into CAP and provide the following:
- A copy of the producer/supplier quality management plan meeting the requirements of Section 7 of QC 5.
 - A copy of the producer/supplier testing laboratory's AASHTO accreditation. One representative 10 pound sample for each type of GGBFS along with the corresponding mill test report. Samples shall be taken in accordance with the QMP.
 - A copy of the Safety Data Sheet (SDS) as applicable for each sample submitted.
 - Mill test reports from the previous three (3) months from the producer/supplier facility.
- 6.2 WSDOT will evaluate the submittal and may test the samples provided in accordance with Section 9 of QC 5. WSDOT will notify prospective producers/suppliers in writing after completion of the evaluation. All determinations of approval or rejection by WSDOT shall be final.
- 6.3 The producer/supplier shall allow WSDOT to visit and observe the quality control activities and provide samples to WSDOT upon request.

7. Production/Supplier Facility Quality Management Plan

- 7.1 The quality management plan, as a minimum, shall identify the following:
- Facility type.
 - Facility location.
 - Name, email address, and telephone number of the contact person responsible for the quality control of the facility.
 - List each quality control test method to be performed on each grade of ground granulated blast-furnace slag.
 - Name and address of the AAP testing laboratory performing specification compliance testing.
 - Declaration stating that if a test result indicates a lot of GGBFS is not in compliance with the WSDOT specifications, the facility shall immediately notify WSDOT of the lot in question. A representative sample for the production period in question shall be sent to WSDOT for testing.
 - Description of the method and frequency for sampling, quality control testing, and specification compliance testing.
 - Grade of GGBFS the producer/supplier intends to provide to WSDOT.
 - A statement of compliance with Section 5.
- 7.2 A new quality management plan shall be required whenever changes occur that cause the existing quality management plan to become inaccurate or invalid.

8. Documentation Requirements

- 8.1 Each producer/supplier shall certify conformance to *Standard Specifications* for physical and chemical requirements of AASHTO M 302/ASTM C989 by means of a mill test report.
- 8.2 A mill test report shall be provided monthly by the producer/supplier to WSDOT on a continuous basis for AASHTO M 302/ASTM C989 GGBFS production.

Ground granulated blast-furnace slag test reports shall be in English and include the following information:

- Name of producer/supplier
- Specific grade of GGBFS in accordance with *Standard Specifications* Section 9-23.10
- Unique identification number traceable to the date of production
- Production date

- 8.3 A mill test report shall be provided by the GGBFS producer/supplier to WSDOT whenever a new shipment of AASHTO M 302/ASTM C989 imported GGBFS is received for distribution.

GGBFS reports shall be in English and include the following information:

- Name of producer/supplier
- Specific grade of GGBFS in accordance with *Standard Specifications* Section 9-23.10
- Unique identification number traceable to each shipment
- Certification date

- 8.4 Separate sequences of mill test reports shall be provided for each individual production facility and a unique lot number traceable to a production run on GGBFS shall identify each report.

- 8.5 The mill test report shall show the test results and the applicable specification of AASHTO M 302/ASTM C989 for each component or property tested and shall show the test requirements specified by WSDOT.

- 8.6 When a production facility does not produce GGBFS in a given month, or no shipments are received by a supplier, the producer/supplier shall notify WSDOT with a no production report for each month of no production or shipment.

- 8.7 Mill test reports and no production reports shall be emailed to the CAP program at the following email address: caprogram@wsdot.wa.gov.

- 8.8 The producer/supplier shall notify WSDOT at the email address noted above of any temporary stops in production (greater than one month) or permanent stops in production.

- 8.9 All documentation shall be submitted to WSDOT within 28 days of the last day of the month of production or shipment.

9. Quarterly Split Sample

- 9.1 Producers/suppliers shall, on a quarterly basis, provide a split sample of each grade of ground granulated blast-furnace slag being produced.
- 9.2 For the purpose of this standard, quarters are defined as January through March, April through June, July through September, and October through December.
- 9.3 Split samples shall be taken from production or shipment in accordance with the producer/supplier's quality management plan.
- 9.4 The production sample shall be split into two portions (approximately 10 pounds each) for each grade of GGBFS being produced. One portion shall be retained by the producer/supplier and one portion shall be sent to WSDOT CAP.
- 9.5 The producer/supplier testing laboratory shall conduct chemical and physical testing on their portion.
- 9.6 The sample submitted to WSDOT shall be labeled with the grade and lot number traceable to the production run or lot of GGBFS. WSDOT may elect to test the sample.
- 9.7 Samples shall be sent to:

WSDOT State Materials Laboratory
ATTN: Cement Acceptance Program
1655 S Second Ave SW
Tumwater, WA 98512-6951
- 9.8 The quarterly split sample mill test report shall be emailed to the CAP program at the following email address: caprogram@wsdot.wa.gov
- 9.9 The producer/supplier shall email CAP at the email address noted in Section 9.8 if no GGBFS was produced/supplied during that quarter and no sample will be submitted.
- 9.10 The quarterly split samples, and accompanying mill test report, shall be submitted to WSDOT within 28 days of the date of sampling.

10. Comparison of Split Sample Test Results

- 10.1 Results of the split sample testing shall conform to the applicable AASHTO or ASTM specification requirements.
- 10.2 If any discrepancy is identified between the producer/supplier and WSDOT's test results the producer/supplier shall prepare a response to WSDOT, within 30 days of being notified of discrepancy.
- 10.3 The response shall identify the cause of the discrepancy and describe any corrective action taken.

11. Revocation of Qualification

11.1 A producer/supplier may have its qualification status revoked and be removed from the QPL if found in nonconformance with the *Standard Specifications* or this standard practice. Causes for removal from the QPL may include, but are not limited to, the following:

- Failure to comply with requirements of QC 5.
- Failing test results on produced/supplied samples.
- Failure to notify WSDOT of changes in product formulation.
- Failure to send in a retained sample for additional testing for a production period with failing test results.

Prior to removing a producer/supplier from the QPL, WSDOT will take appropriate measures to confirm the validity of the information and will confer with the producer/supplier.

12. Requalification

12.1 Once a product has been removed from the QPL, the producer/supplier may request reinstatement by providing the following written information to WSDOT:

- The root cause and corrective action taken to prevent future reoccurrences of the problem that caused the removal from the QPL.
- Updated quality management plan showing compliance with QC 5.
- Other information and test data as determined by WSDOT.

Provided there is a satisfactory resolution of the initial problem, at WSDOT's discretion, the product may either be reinstated into the QPL or the producer/supplier may be required to reapply to the QPL. All costs of the QPL process shall be borne by the producer/supplier.