

## **SECTION 106 CONTROL OF MATERIALS**

### **106.1 General**

- (1) Provide materials conforming to the contract. Use materials the contract specifies unless the engineer authorizes substitutes under 108.8. Monitor construction operations to identify potential nonconforming materials and prevent their incorporation into the work. Except as required under the contract, ensure that products incorporated into the work, either temporarily or permanently, do not display advertising or messages that are not directly related to the manufacturer, properties, or function of those products; or advertising or messages in violation of state statutes.
- (2) All materials are subject to the engineer's approval before incorporation into the work. The engineer may inspect or test all materials at any time during their preparation, storage, and use. Notify the engineer of the proposed source of materials before delivering those materials to the project site. If the engineer requests, provide samples of material and access to facilities that the engineer needs to assess the acceptability of all materials. The department will, on request, share with the contractor available information on a source or material. The department will maintain a web-based list of approved aggregate sources. Aggregate producers must provide test results as required in the department policy for aggregate source approval to have their source approved and to keep that approval over time.
- (3) For fabricated components, the materials and the fabricator are subject to the department's approval before delivery of those components to the project site. The engineer may require the contractor to obtain components from another department-approved source if the department determines that a fabricator's product does not conform to the contract.
- (4) Do not incorporate materials into the work until the engineer approves those materials. However, the contractor may request permission to incorporate materials not already approved. The engineer will grant this permission only if the contractor can provide convincing evidence that the engineer will subsequently find those materials conforming. Incorporation of materials before approval is at the contractor's risk and permission to do so does not imply that the department will subsequently approve those materials.

### **106.2 Supply Source and Quality**

#### **106.2.1 Waste Materials**

- (1) The department encourages the contractor to incorporate material from the WDNR list of special wastes, cited in section 895.58 of the Wisconsin statutes, into the work. The department encourages use of the maximum amount of special waste consistent with the contract and standard engineering practice.
- (2) For materials used during construction but not incorporated into the work, use multiple-use or biodegradable products, if it is practical, to minimize the amount of solid waste generated during construction operations.

#### **106.2.2 Preference for American-Made Materials**

- (1) If all other factors are substantially equal, furnish materials manufactured to the greatest extent in the United States as provided in Wisconsin statute 16.754.

#### **106.2.3 Product Substitution**

- (1) Provide US standard or SI metric system products as the contract specifies. The department will allow substitutions for the specified product if both of the following conditions are met:
  1. The substitute product is made from the same material as the original product, and complies with the corresponding specification requirements for the substitute product.
  2. Dimensions of the substitute product are essentially equal to dimensions of the original product. The department will allow established manufacturing and fabrication tolerances unless the contract specifies absolute maximum or minimum dimensions.
- (2) Certify to the engineer, in writing, that the substitute product complies with the requirements of 106.2.3(1). The contractor shall not furnish the substitute product until the engineer approves the substitution in writing. The department will pay for the installed quantity of the substitute product at the contract price for the original product.

#### **106.2.4 Conditional Approval of Materials**

- (1) The department may require, by contract or at the discretion of the engineer, inspection of materials at the point of manufacture or source of supply. The department may conditionally approve materials found to be in compliance at the point of manufacture or source of supply.

- (2) If inspection is required at a manufacturing or source plant, do the following:
  1. Provide the engineer with the results of relevant tests the contractor or producer performs.
  2. Cooperate with and assist the engineer.
  3. Secure for the engineer full access to parts of the plant used to manufacture or produce materials when contract work is in progress.
  4. If the engineer requires, secure acceptable working space in or near the plant.
  5. Provide advance notice of production schedules as the engineer requests.
  6. Provide and maintain adequate safety measures at the plant for the engineer.
- (3) The engineer may prohibit project site delivery of materials requiring inspection at the point of manufacture or source of supply until the engineer grants conditional approval.

### **106.3 Approval of Materials**

#### **106.3.1 General**

- (1) The department will approve materials or components demonstrated to conform to the contract. The department will base its approval on conformance with the contract as close as it is practical to the point of incorporation into the work. The department approves materials based primarily on the engineer's tests, tests the contractor performs under the quality management program, or tests the manufacturer performs and certifies. For materials conditionally approved at the point of manufacture or source of supply, the engineer may:
  1. Retest or re-inspect materials after delivery to the project site.
  2. Reject material subsequently found to be non-complying.
- (2) The department may augment test results with documented performance history or inspection of processing, storage, handling, and construction operations. If the contract requires or the engineer requests, the contractor shall provide written documentation of the origin, composition, or process of manufacture of a material.
- (3) The department's approval of materials or components does not constitute acceptance of the work incorporating those materials or components.

#### **106.3.2 Approved Product Lists**

- (1) The department maintains product acceptability lists and other lists of approved products and approved manufacturers or suppliers. The department includes products on these lists based on the results of prior testing and a satisfactory performance history on departmental projects. The department may retest or re-inspect products after delivery to the project site to verify that they conform to the contract. A product is nonconforming if verification test results indicate the product does not meet the requirements for inclusion in the department's approved products list.

#### **106.3.3 Approval by Certification**

##### **106.3.3.1 General**

- (1) For manufactured products or assemblies, the department may base acceptance on a product certification or require both a product certification and production plant certification.

##### **106.3.3.2 Product Certifications**

- (1) For manufactured products or assemblies, the engineer may accept a certified report of test or analysis, or a certificate of compliance instead of performing tests on samples. If not designated in the contract for the specific material involved, the engineer will determine the form and distribution of the required documents. Submit the number of copies of each document that the engineer specifies.
- (2) For testing documented by certificate, all sampling and testing procedures and testing facilities are subject to the review and approval of the department. The department may sample and test products to verify the certified test results. Provide samples as the department directs.
- (3) Create a file of manufacturers' certificates of compliance for the contract. Maintain these certifications on file for a period of 5 years after completing the contract work. If the department requests, provide the requested certification within 5 business days.
- (4) Products are nonconforming if one or more of the following apply:

1. Certifications are not provided within the specified time or in the specified form.
2. Certified properties do not conform to the contract.
3. Verification test results indicate the products do not conform to the contract.

### **106.3.3.3 Plant Certifications**

#### **106.3.3.3.1 Precast Concrete Products**

- (1) The department specifies precast concrete components and will allow precast alternates for cast-in-place concrete components. Ensure that precast concrete conforms to all of the following:
  1. All specific contract requirements for individual components.
  2. Components are manufactured in a plant certified by one of the following organizations:
    - Wisconsin Concrete Pipe Association.
    - American Concrete Pipe Association.
    - National Precast Concrete Association.

#### **106.3.3.3.2 Prestressed Concrete Products**

- (1) Conform to the prestress plant certification requirements specified in 503.2.4.

### **106.3.4 Approval By Sampling and Testing**

#### **106.3.4.1 General**

- (1) Except as specifically provided in the contract, the engineer will determine sampling and testing frequencies and sample locations, both on and off the project site.
- (2) The department will determine the sampling and testing methodology using the following order of precedence. The department will:
  1. Use specific methods the contract references.
  2. Use CMM specified methods if the contract does not reference specific methods.
  3. Use department standard practices if the contract does not reference specific methods and the CMM does not specify a method.
- (3) The department will maintain copies of all AASHTO and ASTM sampling and testing standards referenced in the contract. Contractors, bidders, or the suppliers of materials may examine those standards at the department's central office in Madison. The department will also make available for examination all other standards referenced in the contract as well as the department's sampling and testing standard practices.
- (4) All department and contractor personnel engaged in sampling and testing of materials to be incorporated into the work must be qualified under a department-accepted program for the specific tasks they are performing.
- (5) All laboratory facilities employed in sampling and testing of materials to be incorporated into the work must be qualified, for the specific tests they are performing, by the department under its laboratory qualification program.

#### **106.3.4.2 Department's Material Testing Program**

##### **106.3.4.2.1 General**

- (1) Furnish without charge all samples that the engineer requires and provide the facilities and staff required for collecting and forwarding them to the department. The department will, on request, share with the contractor test results obtained on contractor-furnished samples of materials.

##### **106.3.4.2.2 Department-Approved Aggregates**

###### **106.3.4.2.2.1 General**

- (1) Coordinate with the engineer to collect sample aggregates. The engineer and contractor will jointly obtain and split the sample. Ensure that the sampler is HTCP certified to sample aggregates. Costs associated with the required aggregate quality sampling and testing are incidental to the work.
- (2) Test coarse aggregate sources every 5 years for pits and every 3 years for quarries. The department will test sources requiring more frequent testing. The department maintains a list of current aggregate source test results at:

- (3) Ensure that testing is performed at a facility conforming to the department's laboratory qualification program by a HTCP technician certified to test aggregate quality and that testing is performed.
- (4) Perform testing on the split of the sample conforming to the following:
  - LA Wear (100 & 500 revolutions).....AASHTO T 96
  - Sodium sulfate soundness (R-4, 5 cycles).....AASHTO T 104
  - Fracture ..... CMM 13.9
  - Liquid limit <sup>[1]</sup> .....AASHTO T 89
  - Plasticity<sup>[1]</sup> .....AASHTO T 90
  - Coarse aggregate specific gravity and absorption .....AASHTO T 85

<sup>[1]</sup> Prepare samples according to AASHTO T 146, Method A for the P-4 fracture.

- (5) Provide test results to the department's laboratory. The department may perform testing on their split of the sample for verification.

**106.3.4.2.2 Freeze-Thaw Soundness**

- (1) Perform freeze-thaw soundness testing according to AASHTO T 103. Provide freeze/thaw soundness test results based on the fraction retained on the No. 4 (4.75 mm) sieve using virgin crushed stone aggregates produced from limestone/dolomite sources in one or more of the following counties or from out of state:

Brown	Columbia	Crawford	Dane	Dodge
Fond du Lac	Grant	Green	Green Lake	Iowa
Jefferson	Lafayette	Marinette	Oconto	Outagamie
Rock	Shawano	Walworth	Winnebago	

- (2) The department may waive freeze/thaw testing for existing quarries determined to be in either the Silurian system or the Prairie du Chien group of the Ordovician system of rocks.

**106.3.4.3 Department's Quality Management Program**

**106.3.4.3.1 General**

- (1) If QMP provisions are specified in the contract, the department will base approval of the covered materials on a combination of the results of the following:
  - 1. Contractor quality control testing required under the contract.
  - 2. Optional contractor assurance testing.
  - 3. Departmental verification testing.
  - 4. Inspections of the materials production, storage, handling, and construction processes.
  - 5. Dispute resolution procedures.
- (2) Required sampling and testing methodologies and documentation procedures are specified in CMM 4-15.
- (3) If disputed, approval of materials and components, as well as the subsequent acceptance of the work incorporating those materials or components, is subject to review under a specified dispute resolution process.

**106.3.4.3.2 Technician Certification**

- (1) If required in the individual QMP specifications, both the department's and the contractor's sampling and testing personnel must be certified under the department's highway technician certification program.

**106.3.4.3.3 Contractor Quality Control**

- (1) Provide the qualified quality control personnel required in the contract. Conduct process control inspections, sampling and testing, documentation, and process adjustments required to ensure that the materials incorporated into the work conform to the contract.

**106.3.4.3.4 Contractor Assurance**

- (1) Conduct additional optional testing, as allowed under individual quality management program specifications, to help limit contractor liability for nonconforming materials.

#### **106.3.4.3.5 Documentation**

- (1) If the contract requires, provide: records, control charts, and a quality control plan documenting the reliable production of conforming materials and components.

#### **106.3.4.3.6 Department Verification**

- (1) The department will periodically conduct independent verification tests to validate the quality of the materials incorporated into the work.

#### **106.3.4.3.7 Independent Assurance**

- (1) The department may evaluate all personnel engaged in sampling and testing of materials to be incorporated into the work. The department will base its evaluation on observation of procedures, review of control charts and other required documentation, and spilt-sample testing.
- (2) The department may evaluate equipment the contractor uses to sample and test materials. The department will base its evaluation on visual inspection, calibration checks, or split sample or proficiency testing.

#### **106.3.4.3.8 Dispute Resolution**

- (1) For potentially nonconforming materials, the contractor and department will thoroughly investigate substantive discrepancies in their respective test results. If this investigation does not identify the cause of those discrepancies, the department or the contractor may invoke the applicable quality management program dispute resolution provisions. The dispute resolution team will use these procedures to determine the acceptability of, disposition of, and payment for the affected material.

#### **106.4 Storing and Handling Materials**

- (1) Store and handle materials to preserve their quality and fitness for the work. Provide easy access for the department to inspect and test stored materials. Even if approved before storage, the engineer may find materials nonconforming based on re-inspection before incorporation into the work.
- (2) Provide the engineer with the storage locations of materials intended for the work. If the engineer allows, the contractor may store materials on portions of the right-of-way not required for public travel. Provide additional off-site storage space at no additional expense to the department. Off-site storage areas for approved or conditionally approved materials are subject to the department's inspection and approval.

#### **106.5 Nonconforming Materials**

- (1) For nonconforming materials identified before incorporation into the work, the engineer will do one of the following:
  1. Reject those materials. Unless the engineer allows otherwise, the contractor shall remove rejected materials from the project site at no cost to the department. The engineer may allow the contractor to correct rejected materials. The contractor shall obtain the engineer's approval for previously rejected, but subsequently corrected, materials before incorporating those materials into the work.
  2. Approve those materials subject to potential reduced payment. The engineer will determine the circumstances under which those nonconforming materials may be approved and allowed to remain in place. The engineer will document the basis of approval and may execute a contract change order to adjust the contract unit prices for the nonconforming materials. If the contract does not specify a price adjustment, the engineer may adjust the price.
- (2) For materials incorporated in the work and subsequently found to be nonconforming, the engineer will do one of the following:
  1. Reject those materials subject to the provisions of 105.3.2.2 for unacceptable work
  2. Approve those materials and adjust the contract price as provided in 105.3.2.1 for engineer accepted nonconforming work.